PATHS TO SUSTAINABILITY

Shadow Report
to the Government of Israel's
Assessment of Progress
in Implementing Agenda 21

presented at
The World Summit for Sustainable Development
Johannesburg 2002

An Initiative of Environmental and Social NGOs

Israel 2002

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The Adva Center

Alrazi Association for Environmental Education in Tira

Friends of the Earth – Middle East (FoEME)

The Green Network

The Healthy Cities Network

The Heschel Center for Environmental Learning and Leadership

Israel/Palestine Center for Research and Information (IPCRI)

The Israeli Forum for Ecological Art

The Israel Union for Environmental Defense (*Adam Teva v'Din*)

Life and Environment - Israel Union of Environmental NGOs

LINK to the Environment

The Coalition for Public Participation in Planning

SHATIL, the New Israel Fund's Empowerment and Training Center

The Society for the Preservation of the Historical Sites and Natural Beauty of Modi'in

The Society for the Protection of Nature in Israel (SPNI)

Sustainable Jerusalem

Transport Today and Tomorrow (TTT)

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An Israeli Visual Report to the Johannesburg Summit

The Shadow Report is accompanied by a visual report contributed by members of the Israeli Forum for Ecological Art, who chose examples of their work that relate to environmental issues. The works of art are not illustrations of the texts, but rather indicate a growing interest on the part of artists in environmental thinking. This innovative approach, the incorporation of a "visual report" alongside the written one is in itself a call for collaboration and dialogue between artists, scientists and the community – on behalf of the environment.

Curators of the Visual Report on behalf of the Forum: Rachel Sabag, Racheli Yosef, Galia Gavish.

CONTRIBUTING ORGANIZATIONS

The Adva Center is an action-oriented policy analysis institute focusing on equality and social justice issues. Policy analysis, especially budget analysis, form the basis of Adva's activities. In addition, Adva engages in advocacy, organizing and public education work.

Alrazi Association for Environmental Education in Tira was founded in 1998 by a group volunteer university graduates from Tira, an Arab town of 20,000 residents in the center of Israel. Alrazi works to improve achievement and environmental education and awareness in Tira's ten schools, and among residents, most of whom make a living in petty commerce or as employees in neighboring Jewish cities. Alrazi organizes day-long conferences for school children, as well as clean-up campaigns, and neighborhood restoration. The organization has recently received support for the development of youth leadership for the environment.

Friends of the Earth Middle East (FoEME) founded in 1994 is a regional non-governmental organization that brings Israelis, Palestinians and Jordanians together to deal with common environmental concerns. The organization advocates sustainable development issues around shared ecosystems such as the Dead Sea and the Gulf of Aqaba and lobbies decision makers on regional policy issues dealing with water, trade and transboundary investment projects. The chapter enclosed is the responsibility of the Tel-Aviv office of the organization.

The Green Network in Israel promotes schools in developing a sustainable perception of the natural and social world, as central to their educational agenda, while engaging young people in active change in their community. Serving more than 30 schools around the country, the Green Network supports teachers and schools through in-service training and networking, national and regional conferences, financial aid to green projects in the schools, and leadership training for teachers and young people.

The Healthy Cities Network, which has operated in Israel since 1990, promotes partnerships and coordination within municipalities to help design their health development plans on the basis of a city health profile. All 37 member cities and towns have adopted the principles and strategies of "Health for All", "Agenda 21" and an equity agenda. Members develop active collaboration with service providers and citizens in the city to identify the population's needs, the inequalities in health, and the aspirations of the citizens as a basis for inter-sectorial discussions and a participatory process for priority setting and planning for intervention.

The Heschel Center for Environmental Learning and Leadership was founded in 1998, with a mandate to enhance the intellectual leadership for the Israeli environmental movement, and serve as a central address for Israeli environmentalism, while supporting the expansion of the local environmental movement. The Center works to put forth a vision of a sustainable society in Israel, and to catalyze initiatives within key sectors toward building a sustainable society. Activities focus on fellowship programs and professional seminars, network-building, empowerment of activists and organizations, and producing strategically targeted publications

Israel/Palestine Center for Research and Information (IPCRI) is dedicated to the promotion of Israeli/Palestinian cooperation. It is managed jointly by Israelis and Palestinians and is based in Jerusalem. Its environmental program has been in existence for ten years and has dealt primarily with issues relating to water supply and distribution and the influence of environmental pollution on public health. It has been instrumental in establishing a joint Israeli Palestinian initiative, which promotes the use of mediation as a means of resolving environmental conflict in Israel and the Palestinian Authority areas.

The Israeli Forum for Ecological Art works to increase public awareness of environmental issues through art. Its activities include reclamation and preservation through art, promotion of artwork which sheds light on and investigates environmental problems and the relationship between people and their environment, as well as artwork embodying inter-disciplinary approaches with regard to ecological and environmental issues.

The Israel Union for Environmental Defense (IUED) (*Adam Teva v'Din* in Hebrew) is a membership-based, non-governmental environmental advocacy group. Founded in 1990, the organization uses the courts, independent scientific analysis, planning interventions, legislative reform, and public campaigns to bring about change in government policies and corporate practices affecting the environment and public health. Special advocacy projects focus on air pollution prevention, water quality protection, urban open spaces and coastline preservation, and environmentally sound solid waste management. Through the "Environment and the Community" program, IUED provides free legal aid to local and neighborhood organizations in the Jewish and Arab communities.

Life and Environment – Israel Union of Environmental NGOs is a union of over 70 non-profit, non-governmental organizations promoting the quality of life and environment in Israel. Life and Environment supports a framework for cooperation among its members, provides aid and professional services, and is active in initiating common activities. Life and Environment represents its member-organizations both at the national and international levels.

LINK to the Environment motivates Arab and Jewish residents of the Galilee to action for environmental causes. Since 1995 the organization has worked to improve the quality of the environment in the Galilee, by generating cooperation between various groups to find joint solutions to environmental problems. The target populations for LINK's activities are businesses, local councils and local communities.

The Coalition for Public Participation in Planning: SHATIL (see below) formed the Coalition for Public Participation in the Planning Process in March 1999 to involve Israeli citizens in the planning process. This unique coalition of 23 social justice and environmental organizations aims to raise public awareness and advocate for legislative change regarding the importance of public participation in the planning process and decision making.

SHATIL, the New Israel Fund's empowerment and training center, established in 1982, works to promote democracy, tolerance, and social

justice in Israel by providing training, consultation, and coalition-building assistance to over 500 non-profit organizations in Israel each year. SHATIL's **Environmental Justice Project**, established in 1995, aims to nurture environmental activism in Israel by providing grassroots groups and national organizations with vital capacity-building assistance. SHATIL assists environmental groups to acquire the knowledge and skills required to fight local environmental hazards, and empowers the public to play an active role in protecting the environment.

The Society for the Preservation of the Historical Sites and Natural Beauty of Modi'in works toward the preservation of the ancient site of Modi'in, and encourages sustainable development of the surrounding new urban developments. Famous as the site of the Maccabean Revolt in the 2nd century BCE, recent development in the region has caused damage to archeological sites, and created environmental problems. The society has campaigned to save several important environmental and historical sites, which were turned into recreational parks for the residents of modern Modi'in (future population 250,000). The society also lobbies for legislation to protect the area and for its recognition as an UNESCO site for international pilgrimage.

The Society for the Protection of Nature in Israel (SPNI) is Israel's largest membership non-governmental organization leading the environmental movement. Since its establishment SPNI has been instrumental in increasing public awareness of nature and environmental protection. For almost fifty years SPNI has studied environmental issues and advocated for sustainable development. SPNI's Department of Environmental Protection takes actions through innovative projects and campaigns to promote sustainable development, public transportation, open coasts, clean water and other key environmental issues. SPNI's urban branches in Tel Aviv, Haifa, and Jerusalem and our KESEM regional branch in Bikat Hanadiv give the public a voice in protecting and preserving the quality of life in cities. A hallmark of SPNI's work is the network of field schools serving as study centers for nature and environment; and as hostels for nature travelers. SPNI plays a critical role in wildlife research and preservation through its bird, mammal and plant research centers and through its wildlife hospitals.

The Sustainable Jerusalem Coalition was established in 1998, with 25 founding members, from local and national environmental organizations. It now has 52 member groups, each of which aims to fulfill the goals of the Sustainable Jerusalem Charter. The coalition is assisted by The Forum for the Future of Jerusalem a team of planners, architects and environmentalists, Working together, the coalition aims to create a future planning vision for the Jerusalem metropolis, based on principles of sustainable development. Sustainable Jerusalem promotes Local Agenda 21, working however on an extra-municipal platform.

Transport Today and Tomorrow (TTT), The Israeli Organization for Sustainable Transport, is an independent non-profit which has been active since 1998, with the support of various foundations. TTT's work is volunteer-based, and its members include academics and professionals from the fields of planning and transport, as well as community activists. Among its recent activities are a Transport Ministry-sponsored competition for sustainable transport, and several long-term research projects which have harnessed committed NGOs to the implementation phase.

TABLE OF CONTENTS:

Part II: Sustainable Management of Vital Resources

INTRODUCTION

Eilon Schwartz, Orly Ronen, and Ilana Goldberg
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Background

Agenda 21 is the seminal document of the 1992 United Nations Conference on Environment and Development (UNCED), also known as the "Rio de Janeiro Earth Summit". Recognizing the interdependence of economic, social and environmental issues, and the global environmental destruction which has reached unprecedented proportions as a result of the decoupling of the three, Agenda 21 calls for a change in the fundamental direction of development, towards a sustainable policy. Sustainability, the organizing principle of Agenda 21, demands that development decisions be evaluated according to their effects on fellow world citizens, and on future generations. Agenda 21 argues forcefully that present trends are simply not sustainable, and that development can no longer continue without considering its social and environmental effects in the present and future. Agenda 21 outlines a bold strategy for societal change, which recognizes that environmental degradation is embedded in social issues. Distributive justice, improved education, and participatory democracy are all central to Agenda 21's pioneering approach.

Israel, as one of 178 countries that signed Agenda 21, committed itself to submit a 10–year summary of progress towards a sustainable agenda in Israel, to be prepared for the World Summit on Sustainable Development, to

be held in Johannesburg in August 2002. The following pages are a shadow report to that document—a report prepared by Israeli social and environmental non–governmental organizations (NGOs)—monitoring the progress towards sustainability by successive Israeli governments over the last decade. The report itself in many ways exemplifies one of the few positive trends in Israeli society towards sustainability since Rio. There has been unprecedented growth over the last decade in the number and range of non–governmental organizations active in Israeli society. Indicative of this growth is the fact that whereas in 1992, only one Israeli NGO representative participated in the Rio Earth Summit, this year in Johannesburg a coalition representing 15 NGOs will be present, to contribute their voice to global civil society's demand for progress on implementation of Agenda 21. This development demonstrates not only the dramatic growth of the Israeli environmental movement, but also the move to an environmentalism based on a sustainable frame of thought, rather than simply nature preservation, or the public health paradigm.

This report represents a unique coalition of social and environmental NGOs, who came together to fulfill the role, in the spirit of Agenda 21, of full partner in advocating for sustainable policies in Israel. Each chapter is written by one or more representatives of a particular NGO, and each chapter reflects only that organization's views. Not all subjects are represented in the NGO report. Forestry, agriculture, pollution of sea water, lakes and desertification, while issues of concern to several environmental groups, are not, by and large, the most urgent priorities on the agenda of the environmental NGOs participating in this effort. Conversely, a number of topics are found in the NGO report, which can't be found in the government report. The government's omission, for example, of a significant discussion of environmental justice, or of population and consumption trends, is certainly reflective of a narrower field of vision, which isolates the issue of environmental quality from its social and economic contexts. Especially disconcerting is the governmental report's lack of attention to the distress of Israel's socio–economic periphery, including Israel's Arab ethnic minority. The rationale for the NGO report, in contrast, is premised on addressing these multiple dimensions of sustainability in its analysis of progress.

This report is pluralistic in its structure and content, often using different methodologies and reflecting different points of view. Chapters for the most part follow a similar format of looking back on trends over the last decade, critically discussing the government's report on similar issues, and offering concrete policy recommendations. All contributions are united by a common goal of building a sustainable and equitable future for Israeli society, and the necessity of a vibrant civic society to achieve that goal.

Israel: A Decade of Unsustainable Development

Writing a report on a decade of Israeli progress towards sustainability is, put bluntly, a misnomer. Virtually all major indicators have moved substantially in unsustainable directions. The list is rather formidable. Greenhouse gas emissions have doubled; air pollution levels in cities have increased, and are now recognized as a serious public health hazard; mismanagement of water resources has brought all the country's reservoirs to dangerously low levels, and water quality has severely deteriorated; biodiversity is imperiled by habitat loss and fragmentation; land–use practices and policies have devoured open spaces, in disregard of environmental planning and intelligent land–use principles; both per capita and overall solid waste generation has risen substantially. These trends have all accelerated over the past decade, due to both population growth and an overall rise in standard of living. Israel is possibly the only country in the world today with population growth rates similar to developing countries and developed country consumption rates—this in a small geographical area. Population growth in the last decade, somewhat paradoxically, was due both to mass immigration (of one million immigrants from the former Soviet Union) and a relatively high birth rate, two factors that don't often coexist in most countries. It should further be pointed out that the rise in living standard has been distributed far from equally in the population. The gap between rich and poor in Israel, a key sustainability index, has grown over the decade to one of the largest among developed nations. Environmental goods and bads are distributed unequally among different Israeli ethnic groups, with, for example, Israeli Arabs clearly suffering from environmental injustice.

The developments of the last decade coincide with a broader shift, signaling the erosion of Israel as a welfare state, and its incorporation into the global economy, dominated by market considerations. This shift has accentuated and deepened trends that might have been contained under a different system, and mitigated by different policies. Yet, as particular aspects of the burgeoning crisis reached visible proportions over the decade, public and political awareness grew on isolated issues, and changes can be seen in particular policies. The unimpeded coastal development of the 1990s has largely been curbed, due in great part to a concerted campaign by NGOs, subsequent to which the government formulated a more sustainable coastal policy document (albeit without statutory force); awareness of the need to deal more effectively with the water crisis has been achieved, even though there is yet no consensus on the sound ways to do this and no underlying environmental approach guiding these efforts; "Israel 2020," a strategic

master plan for the 21st century, exemplifies an integrated approach to transport and land uses (a plan which nevertheless lacks statutory force and which was never implemented); the closure of numerous pirate waste dumps and consolidation of waste sites into a few landfills; the legislation of a beverage container deposit law affords the public a role in recycling. However, while attempts to deal with acute manifestations of the growing crisis are of course necessary, they are ultimately meaningless without an acknowledgement that there is something fundamentally wrong with our current approach, and the need for a different direction.

Governmental Policies of Unsustainable Development

Monitoring sustainability in Israeli government policy is a misnomer not simply because Israel has had a decade of unsustainable development. More dramatically, it is a misnomer because the very word is not in the lexicon of public policy. Historically, Israeli society has cultivated an ethos of development as a driving passion associated with nation–building. Extensive exploitation of land resources, harvesting all of the water resources to support a large agricultural sector, the building of housings and settlements to absorb successive waves of immigration, and the dispersal of the population throughout the country were universally regarded as foundations for a secure and prosperous future. Despite the current trends of environmental degradation, signaling that a new direction is now required, a revised conception of development has neither challenged, nor been integrated into, the predominant ethos of Israeli society.

With the exception of professionals in the Ministry of the Environment (and even there sustainability is defined as a subtopic in the larger agenda of the ministry) one would be hard–pressed to find decision–makers who are even aware that the Israeli government is committed to sustainability being the prism through which societal progress is to be assessed. Government continues to adhere to a model of environmentalism based on the idea that it is up to the Ministry of the Environment to mitigate the environmental damage done by development, rather than the notion that development needs to be evaluated according to the principles of sustainability. The old model sees the Ministry of the Environment as largely a necessary nuisance, and relates accordingly. The new model, presently being developed particularly in European countries, sees social and environmental interests as defining the direction of economic progress. As the weakest of the government ministries, there is simply no chance that the Ministry of the Environment can hold its weight against the larger ministries, policing enforcement against conflicting governmental and private interests.

The result has led us to where we are today. A series of themes return again and again in the various chapters, demonstrating that unsustainable development is in fact government policy.

- **Market (dis)incentives**. Repeatedly, we see in the Shadow Report that government financially rewards unsustainable policies, and discourages sustainable ones. The designated price of landfilling mixed waste is less than half the price of material recovery; the price of electricity for Israeli residential consumers is less than half the price paid in Denmark, and substantially lower than other Western European countries; car upkeep allowances given by employers to workers encourage and/or subsidize car use; water use in the agricultural and industrial sectors is heavily subsidized and water costs generally do not reflect externalities; diesel fuels are priced at quarter the cost of cleaner petrol fuels. Pricing that reflects the societal and environmental cost of goods and bads is essential for sustainable policy. Green taxes, where damaging environmental behaviors are taxed, rather than productive work, are becoming an important tool in European sustainable policy.

- **Poor enforcement records of existing laws**. Even though Israel has developed a progressive set of environmental laws and regulations, these have not yet been translated into public policy and specific standards. Weak records of enforcement of environmental legislation contribute to the ineffectiveness of environmental policies and the public perception that "pollution pays."

- **Short–term thinking**. Again and again, short–term interests win out against long–term responsibility. No plans currently exist for phasing out the use of coal in power plants, despite the proven harm of burning coal, and the fact that advanced industrial nations generally are reducing their coal dependency. The red–line of the Kinneret reservoir (Lake of Galilee) is lowered year after year to satisfy current water consumption needs, in disregard of the danger of deterioration in water quality for the entire supply that over–pumping is expected to cause.

- **Unreflectively adopting unsustainable public works projects**. Projects which clearly are the antithesis of sustainable policy are nevertheless adopted, without any significant awareness other than from the Ministry of the Environment that there is something fundamentally wrong with such directions. Plans for a new coal–fired powerplant in Ashkelon are going forward, despite opposition by environmental groups as well as two government ministries; the 8–lane, 300 km long Superhighway #6 (The Trans–Israel Highway) was approved, and parts of it built, without an

adequate assessment of environmentally and socially sustainable transport alternatives.

- **Isolated issues rather than a coherent whole**. Because there is no sustainability perspective, issues are seen as isolated from one another. For one example, the water crisis continues to be seen as disconnected from issues of climate change. Desalinization, ostensibly a partial solution to the crisis, demands massive use of electricity. Meanwhile, to keep up with the growing demand for electricity to which desalinization will contribute, a new coal–burning power station is proposed, rather than an investment in sustainable energy sources.

- **Ignoring the larger geographical context**. Israeli responsibility to the larger global community is not a concern: Israel has not taken any practical or policy measures to reduce its greenhouse gas emissions, as part of the global effort to mitigate global warming and climate change; despite its commitment to phasing out production of methyl bromide, an ozone–depleting substance, Israel has failed to ratify the amendment to the Montreal protocol barring trade of methyl–bromide with non–parties to the agreement. It is particularly shocking in this regard that there is no discussion in the Governmental Report of our relationship with our Arab neighbors, in particular the Palestinians. Agenda 21 makes very clear that sustainability needs to be a global agenda, and that our fates are intricately linked.

- **Trends dictate policy**. Israeli policy–makers view consumption patterns and lifestyle choices as inevitabilities that should be anticipated and accommodated, not altered through education, raising awareness or training. While the water crisis has reached such proportions that it is becoming increasingly clear that the public needs to change its habits, no similar conclusions have been reached on the host of other issues that together make our present lifestyle unsustainable. Conservation of energy has not been defined as a goal or priority, despite its potential for curbing greenhouse gas emissions; waste disposal and recycling techniques are outdated and local authorities ignore the potential of public participation in waste management; transport policy treats car–dependency as a given, with little investment or planning for viable mass transit alternatives. In fact, when asked, and given the proper mechanisms, the public has shown great willingness to change its behaviors. Witness the demand for trains, or the voluntary recycling of plastic bottles. There is no education of the public towards more sustainable lifestyles. In the schools, education for sustainability is virtually non–existent as well.

- **Lack of Public Participation/Lack of Transparency**. While sustainability demands heightened citizen involvement, government, continuing to see sustainability through the prism of mitigation of environmental damage, sees public participation largely as a nuisance, slowing down economic growth. A relatively advanced freedom of information law has been passed, but for the large part has yet to be internalized by government workers. The problem is that this law does not place responsibility on the government to inform citizens about the condition of the environment, but merely provides access to citizens who already know what information they are seeking, if such information exists. Because Israel lacks sufficient mechanisms for public involvement in decision–making, information channels to the public remain underutilized and ineffective. In fact, the government, perpetuates a paternalistic attitude toward the citizenry, in the belief that it knows best how to gauge society's needs and how to direct planning. The recent passing of the amendment to the Planning and Building Law, which authorizes a committee whose sole purpose is the rapid approval of plans for National Infrastructures, curtailing the time allowed for objections and environmental impact assessments, epitomizes the unsustainable direction of public policy with regard to citizen participation. Such regressive legislation contributes to the erosion of Israel's planning institutions by circumventing the normal planning process.

Despite the above, some positive developments should be noted. A potentially important innovation in the legislature is the appointment by law of a Commissioner for Future Generations as a parliamentary post who has the discretion to comment on legislation that has implications for sustainability. While it is still too early to judge if the post of Commissioner will become a significant tool for safeguarding the public good and intergenerational rights, the definition of the role is an indicator of the positive directions and fresh thinking Israel must embrace. It should be pointed out, however, that even when public policy is headed in sustainable directions as, for example, in the ambitious strategic masterplan for the 21st century "Israel 2020," short–term economic interests of maximizing profit are quite successful at derailing such efforts, at the expense of the public good. The transformation of Israel's choice public beaches over the past decade into prime real–estate (before the public outcry that helped restrain this trend) is another case in point. Similarly, the forces of economic globalization and market policy create a momentum of their own, mobilizing capital and energies in directions that are contrary to the interests of environmental and social justice, and giving further impetus to the government's policy of unsustainable development.

Where to from here?

Obviously the first step is the true adoption of Agenda 21 as the guiding principle towards societal progress. Without that, government will continue to search for isolated sustainable actions to prove their commitment to sustainability, within the broader context of an unsustainable development policy. Each chapter in the NGO report outlines what a sustainable development policy might look like in their subject area, spelled out in concrete policy recommendations and targets. As Agenda 21 argues, a key component in building public support and resisting narrow interests that undermine the public good, is transparency in information and decision–making, inviting the public to participate actively in the process.

Simultaneous with a change of policy and its process, must come a change in educational policy. A commitment to sustainability is a commitment to future generations. The public, and particularly the young, must be engaged in being critical of the lifestyles that we choose, and their implications for ourselves, our neighbors near and far, and our children. Ultimately, we need to envision a different path to progress, a process which engages our poets and artists no less than our scientists and policy–makers.

The NGOs will continue to play a central role in moving the sustainability agenda forward. We will continue to lobby, to oppose unsustainable paths, and to advocate for sustainable ones. We shall continue to demand participation in decision–making, and to demand access to the information necessary to make informed and responsible decisions. We shall fight narrow interests which often hijack the public good, and we shall demand policy for the benefit of all Israelis, and those of future generations. We shall continue to turn to the public, to build an ever–growing constituency which supports our efforts, and which makes it clear to politicians that sustainability is not only the right thing to do, but also the popular one. And we shall continue to find partners in government, working together for the common good. Local Agenda 21 recognizes the essential need of the third sector—NGOs—for the successful workings of democracy, and we are proud of our role in building a sustainable future for all of us.

PATHS TO SUSTAINABILITY

Key recommendations for action from the Shadow Report of Israeli Non-Governmental Organizations, in Response to the Government of Israel's Report to the World Summit on Sustainable Development

Overarching Demand

- Israeli NGOs call on the Prime Minister's office to urgently convene an inter-ministerial meeting of all government ministries at the level of Director General in order to advance the NGO 'Recommendations for Action' as detailed below.

Each ministry will be requested to create a position for a sustainability review officer who will be responsible to ensure that sustainable development policies are integrated into all policies and decisions taken by their ministry.

For discussion at the high level inter-ministerial meeting is the Agenda 21 commitment to create a National Council for Sustainable Development (NCSD) to function as a multi-stakeholder body. By the Johannesburg Summit, the terms of reference, resources and powers of the NCSD are called upon to be finalized.

NGOs identify as a key function of the NCSD the need to urgently develop a **Sustainability Strategy** for Israel, with targets, timelines and financial resources stipulated. The strategy must focus on national and international/regional issues and develop an **Action Plan** for implementation. A

first draft of the strategy should be made available for public discussion by March 2003 and finalized by the third quarter of 2003.

NGOs call on the Government to declare its commitment to the following **'Recommendations for Action'** that are drawn out of the Shadow Report, to be later incorporated in the proposed **Sustainability Strategy** and **Action Plan** as appropriate.

At the International Level

- Prior to Johannesburg to have ratified the Amendment to the **Barcelona Convention and its Protocols**, concerning the protection of the Mediterranean Sea.

At the Johannesburg Summit, declare Israel's intention to ratify the 1997 **Amendment to the Montreal Protocol** concerning trade in banned ozone depleting substances with non–parties.

At the Johannesburg Summit, declare Israel's intention to sign on to the Biosafety (genetic engineering) and Aarhus (public participation) Conventions.

At the Johannesburg Summit, commit towards a systematic **campaign to curb greenhouse gas emissions** through energy conservation and investment in renewables, in line with the draft WSSD target of 10% of primary energy supply from new renewable sources by 2010.

At the Johannesburg Summit, declare an increase in Israeli actual **foreign assistance** to 0.1% of GNP in year 2003 with a timetable to meet the Agenda 21 target of 0.7% by year 2010 in accordance with the draft WSSD text.

At the Johannesburg Summit, declare Israel's intention to legislate the requirement that sustainability assessments be undertaken prior to the signing of any **international trade agreements**.

At the Regional Level

At the Johannesburg Summit declare Israel's intention to urgently develop a **regional sustainability strategy** that will detail an **action plan** to deal with regional **water supply** and pollution issues, sanitary solid waste disposal, shared ecosystems (Dead Sea, river basin rehabilitation, Gulf of Aqaba) regional harmonization of environmental standards, monitoring enforcement and period public reporting of results. The environment committee Israel-PA

must be re-launched, with third party assistance if necessary. Israel must declare a plan of action that in addition to safe guarding civilians, ensures that any military action does not target Palestinian infrastructure essential for environmental protection.

At the National Level

- At the Johannesburg Summit declare Israel's intention to **Promote Sustainable Transport** policies by agreeing to the following the measures:
  - Overcoming the existing implementation gap between government plans and actual decisions made to the detriment of the environment.
  - Increasing investment in public transport with an emphasis on inter-modality.
  - Requiring that transport (rather than traffic) transport impact assessments be carried out as a rule for local land-use changes.
  - Making non-motorized transport a national priority of the Ministry of Transport and allocating resources earmarked for improving conditions in local authorities.

- At the Johannesburg Summit declare Israel's commitment to **Reduce Air Pollution** by agreeing to the following the measures:
  - Adoption of the EU standard for low sulpher city diesel for all transport users.
  - A complete phase out of leaded fuel by end of 2002.
  - Narrowing price differential between diesel and petrol.
  - Expedited entry of LPG and other cleaner-fuel vehicles for commercial and private use.

- At the Johannesburg Summit declare Israel's commitment to **Articulate Sustainability as a Core Value of the Educational Process** by agreeing to the following measures:
  - The Ministry of Education will create a Task Force to formulate a strategy to transform both the content and process of education.
  - Model environmental practice within the Ministry of Education—enacting an environmental and socially responsible purchasing policy, promoting recycling in all institutions, conducting environmental audits in buildings and environmental design.

- At the Johannesburg Summit declare Israel's commitment to **Conserve its Unique Biological Diversity** by agreeing to the following measures:

Create a national museum of natural history to systematically study and record the biodiversity of the country.
Promote biodiversity education at all levels.
Declare a long list of previously designated but yet to actually be declared nature reserves.
Make specific and adequate allocation of water for nature conservation.

- At the Johannesburg Summit declare Israel's commitment to **Protecting and Promoting the Sustainable use of Water Resources** by agreeing to the following measures:
  Creation of an independent National Water Authority
  Preparation of an environmentally sound master plan for Israel's water and wastewater**.**
  Cease pollution of ground water and implement river reclamation programs.
  Upgrade its water standards to internationally accepted levels.
  Reform the water pricing system by internalizing environmental costs.
  Efficiency and conservation must be optimized to achieve set targets.

- At the Johannesburg Summit declare Israel's commitment to **Environmental Planning and Sustainable Development of Land Resources** by agreeing to the following measures:
  Repealing all legislation that attempts to 'speed up' the planning process by reducing the public's right to participate in the process.
  Priority to development in the cities and urban renewal and halt to planning that supports suburban sprawl.
  Preservation of agricultural lands whether cultivated or as open landscape including compensation and purchase of property rights.

- At the Johannesburg Summit declare Israel's commitment to **Combat Poverty** by agreeing to the following measures:
  Channel infrastructure investment into Arab localities and Jewish development towns, including the building of rail transport links to the countries commercial centers.
  Improve public schools in low income Arab and Jewish neighborhoods.

- At the Johannesburg Summit declare Israel's commitment to **Advance Minorities** by agreeing to the following measures:
  Recognizing the Arab population of Israel as a national minority.
  Recognize existing Arab villages and communities that have been labeled by the system as 'unrecognized' and thereby denied development opportunities.

Undertake outline plans for existing Arab communities and as priority expand and where needed build new Arab towns and villages and industrial zones to compensate for the past.
Establish new environmental units, strengthen existing ones and create joint units that integrate Jewish and Arab municipalities.

- At the Johannesburg Summit declare Israel's commitment to **Promoting Human Health** by agreeing to the following measures:
  Introducing legislation for mandatory health impact assessments for public urban planning.
  Support research on environmental health issues.
  Launch a national policy for populations with special needs and regulate coordination between the many initiatives.

- At the Johannesburg Summit declare Israel's commitment to addressing the **Challenges to Sustainability of Growing Consumption and Population Levels**, through the following measures:
  Conduct a serious "back-casting" from tolerable future levels of environmental impacts in several dimensions, so as to explicate the choices and measures we now face regarding consumption, population size, and lifestyles.
  Raise public discussion of these pending choices, drawing on the sophisticated debates that have occurred internationally in recent decades, with a sensitivity to equity and gender issues, and to the potential for leakage of political tensions into demographic arguments.

- At the Johannesburg Summit declare Israel's commitment to **Public Participation** by agreeing to the following measures:
  Create informative, reciprocal and participatory procedures for the inclusion of civil society in the formulation of policy and decision making for sustainable development as detailed in the Aarhus convention.
  Repeal legislation negating the role of consultation and participation of NGOs.

- At the Johannesburg Summit declare Israel's commitment to **Sound Management of Waste** by agreeing to the following measures:
  Update the 1974 master plan in a manner that will reduce dependence on landfills, encouraging recycling and advance environmentally friendly technologies.
  Elimination of subsidies for landfills in the form of free land use and absence of liability for long-term environmental damage.

Urgent enforcement of existing laws concerning municipal recycling, beverage containers, hazardous waste disposal and construction waste.

- At the Johannesburg Summit declare Israel's commitment to the **Protection of Coastal Areas** by agreeing to the following measures:

  Promulgate comprehensive and effective coastal protection legislation that can be readily enforced.

  Implement the recently adopted Coastal Policy Document for Israel.

  Expose decision–makers to action that has been taken around the world in relation to coastal issues.

- At the Johannesburg Summit declare Israel's commitment to the **Cultivation of Environmental Awareness through Art** by agreeing to the following measures:

  Promote an interdisciplinary approach to environmental problem-solving by including artists and other humanists into decision-making processes.

  Create interdisciplinary centers and programs for raising awareness and encouraging a creative dialogue that is at once more visual and more spiritually oriented. Preparation of a yearly plan for introducing environmental education into art studies.

  Create a mechanism with budgetary support for including ecological artists in science and planning teams, and in projects for rehabilitating damaged environments, e.g., by including artists in tenders for rehabilitating quarries, waste sites, and streams.

PART I

Social and Economic Dimensions

EDUCATION FOR A SUSTAINABLE SOCIETY IN ISRAEL

David Dunetz
The Green Network

Re–Orienting Education towards Sustainable Development: Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues. To be effective, it must deal with both the physical/biological and socio–economic environment and human development.

Agenda 21, Chapter 36

Introduction

The Earth Summit at Rio in 1992 presented sustainable development as the central challenge facing our generation. The State of Israel participated in drafting the principles expressed in Agenda 21, the commitment of the nations of the world to making the shift to sustainability.

Agenda 21 makes clear from the start that education must serve as a central vehicle for bringing about change in this direction. Only by raising awareness, allowing open access to information, and developing participatory democratic structures and capabilities for people of all ages and social groups, will we be able to forge the transformation necessary to meet the needs of this generation, while restoring and caring for the environment for coming generations.

Young people are our link to the future generations, and in Agenda 21 were recognized as being absolutely essential to the process of building sustainable communities:

> **By 1993, governments should take measures to establish procedures to allow for consultation and participation of youth of both genders in decision–making with regard to the environment, natural resources, housing and recreation, control of pollution in both rural and urban areas. (Agenda 21, Chapter 25)**

The intention of Rio and all subsequent efforts was to point out the critical need to forge a new kind of education—an educational process that involves young people in gaining skills for the challenge and practice of sustainability.

This essay seeks to map how far Israel's formal educational system has come in implementing steps in this direction. It must be noted that, bluntly put, sustainability is as yet no household word in Israel. I will try to explain why this is so, and why the educational community in Israel has, until very recently, relegated the challenge posed by sustainable development to a marginal place, low on the list of national priorities.

There are some positive signs of change. Local efforts and educational responses to the environmental crisis abound at the grassroots level. Many of these offer compass points and models of good practice that can help form a coherent government policy, and a renewed commitment to education "as if the planet really mattered"—education for a sustainable society in Israel.

Israeli education: what has changed since Rio?

Any assessment of the degree to which education in Israel has taken to heart the principles and intentions of the Earth Summit in 1992, we must first look back at national educational policy over the last decade. Have the central educational system and various government bodies taken any steps toward implementing long–term programmatic and structural changes to reflect the commitment to sustainability Israel made at Rio? The answer is clear: almost none.

This is not to belittle, for a moment, the sudden growth of local initiatives, the work of NGOs and isolated efforts of teachers and concerned citizens. These, as I will try to show later, offer a ray of light that can signal a way forward. However, we must first consider the lack of attention to sustainability in Israeli educational policy and practice, and more specifically within environmental education.

Sustainability is still essentially an unfamiliar concept, rarely appearing in textbooks or curricula and almost never in "serious" educational discourse,

formal programs or curricular projects sponsored by the Ministry of Education. The burgeoning awareness of both the global and the local environmental crises have in fact done little to change the relatively marginal place relegated to environmental education in terms of priorities and resources allocated to the field.

The sobering general statement of the Environment Ministry's Executive Report on Sustainability provides an apt description of the official educational response to the challenge of sustainability in Israel: "Environmental issues have not yet been placed at the top of the political agenda." This adequately summarizes the state of education in Israel, still entrenched within a worldview that has not given much thought to sustainability, while existing programs "have not yet been successful in changing trends nor in steering the country toward a sustainable path".

The roots of neglect in Israeli education can be found, I believe, in the wider social context. Over the first half–century of statehood, the issues of security and the Arab–Israeli conflict have dominated public consciousness and preempted the treatment of social and environmental concerns in Israeli society. In a similar way, post–holocaust Israel has consistently rejected international restraint measures, such as banning nuclear arms, for example, which it sees as illegitimate in the wake of the struggle to survive. Tragically, it has seemed next to impossible to hold on to any political policy with a long–term view, in the face of the chronic uncertainty about the future that has characterized contemporary Israel.

A little less than a decade ago, many believed that Israel was on the path to unprecedented prosperity, being at the height of the peace process that promised the dawning of a "new Middle East" and the transformation of Israel's relations with both its neighbors and the world. It appeared that perhaps the stage had finally been set for dealing with the complex issues of a fractured multi–ethnic society and the rapidly degrading natural world.

Unfortunately, a decade later, Israel is ostensibly at war with the Palestinians, and as violence and terror abound, we have come as far away from any notion of a sustainable society than ever before. Successive governments have raced to keep pace with the increasing dominance of the global economy. Privatization, a growing mass throwaway consumption economy, and an influx of cheap labor from Third World countries, have all contributed to widening the gap between rich and poor. Israel ranks lower on almost all indices of social equality, environmental justice and health than it did a decade ago. Short–term economic and political interests often collude to gorge even more out of the landscape and of what remains of Israel's natural resources. The national water crisis, where mismanagement of the public interest, and drought, have brought Israel's water table to

dangerous levels, is but one case in point. Ten years after making a commitment to sustainable development, Israel is a far less egalitarian society, and we leave far less for future generations.

It therefore comes as no surprise that Israeli education has come to reflect the priorities of a public policy that has barely begun to place sustainability on the agenda. The Ministry of the Environment, formed just over a decade ago, has been largely uninfluential, primarily because it is perceived as having a minor ministerial role, with a small budget and little political clout. The educational initiatives sponsored by the Ministry of the Environment have been sporadic and have had minimal lasting effect. Most of the projects listed in the Ministry report for Rio+10 were initiated by NGOs and charitable organizations. The existence of these initiatives gives the rather misleading impression that the formal educational system is taking full responsibility in this sphere. We must ask, instead, whether sustainability and the environment are being "outsourced" and so continue to be marginalized on the educational agenda. This being the case, veritably good initiatives in education have had little influence on resourcing and policy changes in the educational system, and thus exempt it from enacting widespread changes to meet the implications of building a truly sustainable society.

The Ministry of Education's track record shows but scant concern for environmental education. The Ministry does not even have a listing of schools in Israel that teach environmental studies, and seems content to have the environment treated in an ad hoc fashion, with almost no budget for teaching hours, no inspectorate dedicated to environmental studies and no core curricular guidelines or recommendations for schools. The closest office is the "National Inspector of Environment and Agriculture" an anachronistic throwback to early state days when agricultural study was linked to the Zionist project of settling the land. Sadly, the environment is not a recognized subject of study—there are no formal in–service training programs and little pre–service teacher training worth noting. The growth of the environmental studies matriculation examination at the secondary level is a notable exception, although its emphasis has been for the most part science research–based.

What went wrong with Israeli environmental education?

Even if the amount of resources invested in environmental education by government ministries has actually risen over the last decade, the quality of these programs leaves much to be desired from the perspective of sustain-

ability. Both the content and process of existing environmental educational practice in schools fall short of the challenge posed by Agenda 21 for building a more just and sustainable society. For this reason, it is important to look critically at dominant modes of environmental educational practice in Israeli schools, and to examine both their roots and intentions, in order to assess where Israeli education can spring forward in this area.

Particularly useful is Eilon Schwartz's analysis of the three paradigms in Israeli environmental education (see Appendix I), which has been very influential in spurring a reflective re–assessment of practice in many circles. The study traces the evolution of Israeli environmental education from its early roots in the romantic Zionist relationship to "Nature," to the subsequent "environmental studies" paradigm, based on a scientific–technological problem–solving approach to the environmental crisis. Schwartz calls for the adoption of the new emerging paradigm of place–based environmentalism coupled with a re–envisioning of cultural values and the cultivation of environmental literacy to meet the challenge of sustainability.

A closer look at Israeli schools reveals that eclectic approaches predominate. Paradoxically, the lack of any required core environmental curriculum for schools has stimulated many sporadic initiatives by teachers, seeking to address environmental issues in some way. For the most part, however, these are seen as "extracurricular" programs and not part of the mainstream learning process. Elementary schools in Israel enjoy relative flexibility and freedom in adopting different curricular approaches and many of these initiatives are often more locally based and experiential.

When the environment does appear as a subject of study, it is generally linked to science study. "Inquiry" and "research skills" are leading buzz-words in educational jargon today, and the environment provides a platform for this within science study. Many Israeli science texts relate to the environment as part of the chapter on "energy" or "the water cycle", with only cursory references to the environmental crisis, if any. One recently published Israeli science textbook, for example, includes overpopulation as a topic of study but makes almost no reference to cultural values and dilemmas inherent to this topic.

In the past, Israeli young people were regularly exposed to the natural world through school trips that focused upon walking and hiking as a way of knowing "the land of Israel." This approach, rooted in the romantic Zionist notion of national rebirth and re–connection to the land, was part of the core curriculum of Israeli schools. The development of a more urbanized con-sumer lifestyle in Israel, and the current public anxiety about security, have

made this a far more rare occurrence, although there are still remnants of this tradition in most schools.

As an Israeli pupil moves into junior high school, he or she will continue to encounter the "environment" within the science curriculum, and a small minority will enroll in environmental study towards the matriculation exam. Until now, these "ecotope" projects have been almost purely science–research orientated, and have rarely sought to engage young people with the social and cultural dilemmas in which environmental problems are situated. Social studies, values education, and democratic education are deemed separate pursuits in schools, rarely connected to environmental justice and ethics. Young people as a whole are given few opportunities to train for meaningful democratic participation, or to engage in activism for change in their schools and communities.

Recent polls have indicated that the Israeli public is relatively well–versed on major environmental issues, and displays a high degree of awareness about pollution and global warming, in comparison with the general public in Western Europe and the Unites States. When questioned, however, about their willingness to act for change or as to their belief in the possibility of change, the Israeli public ranks far lower than counterparts in other countries.

Israeli schools reflect this dichotomy in relation to environmental education. Drawing on Eilon Schwartz's taxonomy of educational approaches, it can be said that Israeli schools tend to be "stuck," somewhere between the first and second paradigms, placing environmental education in the purview of nature study or within a narrow science–based framework. These may indeed lead to factual knowledge about the environment, but do not engage pupils as active protagonists for change. Few schools, it seems, have succeeded in adopting an integrated trans–curricular approach that links fields of study and the personal–affective experience of being a part of nature on the one hand with the cultivation of social responsibility and stewardship on the other. Failure to make this link between school and the issues young people face in the "real world," remains a real obstacle to creating an education which will give young people the knowledge and skills necessary for working towards sustainability in Israel.

Changing tides: a shift in Israeli environmental education

In almost stark contrast to central government policy, Israeli grassroots initiatives give good cause for optimism. It is useful to look at some of the

models these offer for expanding and strengthening education for sustainability in Israel.

In the past few years Israel has seen a growth spurt of NGOs and groups interested in environmental issues. A recent poll places their number at nearly 200 today across the country, but this is no doubt just the tip of the iceberg. There is no question that public awareness about the environment is of a different grade than a decade ago. Many groups and institutions have also begun to revise the environmental education component of their activities. A good example of this is the **Society for the Protection of Nature in Israel (SPNI)**, which over the last decade has shifted its orientation from a Sierra Club–like organization devoted chiefly to nature preservation, to a focus on publicly based activist campaigns in urban centers. This move was accompanied by the development of an educational wing that emphasizes environmental justice, citizenship and community models linking schools to activism. Likewise, traditional institutional bodies such as the Jewish National Fund and the National Parks Authority have refashioned their image as environmental organizations, and have all revamped their educational wings in this regard.

The formal educational sector, as I have pointed out, generally lags behind these trends, despite a few praiseworthy achievements such as the Year of the Environment, which the Ministry of Education declared in 1994, and which gave a boost to many programs and activities that year in schools. One can marvel, however, at the plethora of local initiatives taken by teachers, parents and community groups. A large number of schools and community centers in Israel now take on environmental projects, clean–ups, and adopt local sites of natural and historical interest. The decentralized character and relatively greater curricular flexibility enjoyed by elementary schools in Israel has served as a good substrate for place–based activity that arises from local needs, and allows environmental issues to enter into the school through the back door. Secondary schools, on the other hand, are far more constrained by the requirements of the baccalaureate (matriculation) examinations, and therefore allow much less flexibility for activist projects. The popularity and growth of the Environmental Studies matriculation examination, however, attests to a growing interest among pupils and staff to engage in this field of study.

Recent years have seen a steady growth of conferences and courses offered in environmental education. **The Second National Conference on Environmental Education** took place in Tel Aviv in December 2001, drawing over 300 educators from all over the country. This event, and other concurrent regional conferences and workshops, are meeting a growing demand for training environmental educators, and exchanging ideas and good practices from the field. We have seen a growth of in–service courses for teachers on

environmental education, although these are still sporadic and largely based on local initiatives.

The Heschel Center for Environmental Learning and Leadership has grown to fill the gap in supporting the development of leaders from various sectors and forging a vision of sustainability for Israeli society. The Center hosts various courses for the public and private sectors, and has developed an interdisciplinary Environmental Fellowship program as means of catalyzing the development of a broadly–based environmental movement in Israel. The Heschel Center houses a resource center and produces independent research to provide the public and the media with information, as a local branch of the Worldwatch Institute. Its activities include the annual publication of *Vital Signs—Israel***,** and sponsorship of translation and publication of other environmental literature and materials.

Green Course—Students for the Environment has developed programs for schools and youth movements, as well as having a large impact on the environmental awareness of university students throughout the country. Green Course runs "green days," and longer–range programs, devoted to sustainability issues at primary and secondary schools across Israel. Many of the activities are connected to the organization's national campaigns, and the entire project is oriented towards motivating and guiding school–students toward activism, involvement and personal responsibility. The organization has recently begun a program to develop environmental leadership through the national youth movements. This is all in addition to the regular activity in tertiary campuses—"green days," academic courses on environmental issues, study days, greening campuses and activist campaigns on sustainability issues.

The Israeli Forum for Ecological Art has been active in promoting ecological art as a new creative field within environmental studies. Among other activities, the Forum has created a curriculum for ecological art, which can be adapted to various levels and implemented in art programs within schools, colleges and academies. In 2001–2002 a collaborative project was carried out with children in special education, involving the planning and creation of an ecological–art schoolyard. Other initiatives involve the collaboration of artists, industry and scientists in the rehabilitation of rivers and natural sites.

My own place of work, **The Green Network**, is yet another testament to shifting interests and desires for environmental education in schools. This project was founded three years ago by *Tochnit Karev* (Project Involvement) and the Heschel Center, through a grant from the Andrea and Charles

Bronfman Philanthropies. Today, the Network has grown to nearly 40 schools, trying to meet the growing demand for educational support and funding for environmental education in the schools. The Network supports individual schools with small grants for environmental initiatives, sponsors teacher training to empower teachers to place environmental education and community activism on the agenda at schools, promotes green auditing and practice in schools, and encourages schools to create opportunities for young people to gain the knowledge, confidence and skills to promote a sustainable way of life in Israel.

The Green Network teamed with the SPNI to organize **the First Conference of Young Environmental Activists,** which hosted over 300 representatives from over 40 schools across the country in June 2001. In this way, the Network seeks to build coalitions and sponsor the growth of additional networks of teachers, educators and community groups practicing activist environmental education. It has been a chief concern of ours in the Green Network to develop networking platforms among all sectors in Israel, i.e. the Arab, Jewish, religious, and secular communities, for the exchange of ideas and mutual support in developing environmental education. We have thus initiated the flux of educational conferences mentioned above, and inaugurated the first teacher's journal of its kind in Israel, devoted to Environmental and Social Education (entitled ***Hakadur Beyadenu***: "The Ball [i.e. the globe/world] is in our Court"). This well–received publication is geared at disseminating good environmental practice, while furthering educational discourse on the environment and sustainability in Israel.

Education for sustainability in Israel: toward a policy shift

> Because society is a part of nature, and the health of nature depends on the health of society, all of which has to do with how humans live—culturally, socially, politically, ecologically—is environmental education. A transformation toward a more sustainable society can be accomplished only through fundamental and sweeping changes in the educational experiences offered to young people, from pre–school through professional school. At the same time, young people must continually help their elders to re–envision a just and sustainable future toward which we can all strive. (Strauss, 1996)

As we have seen, sustainability has largely been a non–issue in Israeli educational discourse, and authorities are just beginning to make it part of the agenda for schools. If we are to take seriously the true educational implications of Agenda 21, this must change. **First, this will require that the Ministry of Education take the lead in implementing policy change that places sustainability as a strategic national pedagogic goal in the coming years.** Anything less, however, will amount to continuing the present state of affairs in which environmental destruction, social and

economic disparities and the values of caring and responsibility for the public good continue to be relegated to a peripheral place in education. Because these issues are at the heart of Israel's current malaise, they cannot be postponed any longer.

Though enmeshed in conflict and violence, Israel can move forward toward a sustainable vision of society in the 21st century. This is not only a necessity and a renewal of Israel's global commitment at Rio, but perhaps also offers a wedge that can help form a new perspective of the future, allowing Israeli society to forge a healthier relationship with both the social and natural world than that in which we currently find ourselves. Though education cannot fulfil this task alone, it will play a very central role in this shifting paradigm. The traditional value placed on education in both Jewish and Palestinian society, and the relative strength of the Education Ministry makes education an even more central avenue to remolding social and cultural priorities towards a sustainable Israel. The educational system can take a leading role as a model of integrating sustainability into both the content and process of learning; it can take the lead in "greening" the infrastructure of schools and the very large number of allied institutions that work within the framework of the educational system.

What then must be done to help support this shift? Surely this will take a bold reassessment of budgeting and priorities in the field of education. This goal calls for no less than a change in educational policy, and a refashioning of content and pedagogical approaches. The following recommendations are offered to educators and education policy–makers as ways to move forward toward the goal of forging an education for sustainability in Israel.

Changing the content and process of education

Facing the crisis within Israeli society and its relation to the environment requires that we adopt an integrated, multidisciplinary approach. The problems and their solutions are not restricted to one discipline or to one branch of science. Nor can we hope to gain much today from a romantic approach to nature preservation "out there" in pristine reserves while most children grow up in urban sprawl. The challenge posed by adopting the "third paradigm" of a place–based environmental education is still new within the Israeli milieu. It will require a welding of science and ecology to community education, citizenship and activism. This "holistic," value–oriented approach looks at both the place of humanity in nature, as well as at the social and political implications of creating a sustainable society.

How will schools be different if they adopt an approach to education "as if the planet (and with it a sustainable Israel) really mattered?" Here, some well–accepted principles can serve as benchmarks for introducing **environmental literacy** into mainstream Israeli education:

- **The interdependence** of all life as central to all education: Young people must be given the opportunity to experience a "sense of wonder" and appreciation of the natural world, the sense that they are a part of the ecosystem. They must learn that they are part of an interconnected community, human and non–human, which forms a basis for moral and ethical restraints and responsibilities.

- **Living lightly on the planet:** The study of ecology, and with it the effects of the environmental crisis, can be integrated into all subjects. Schooling must deal with the "ethics of consumption," globalization, poverty and justice issues, while offering young people the knowledge and skills to develop sustainable practices and lifestyles in their own home and community.

- **Democracy** requires a well–informed citizenship that participates in and influences decision–making. Young people must acquire tools for looking critically at current practices in their community and local environment, and they must gain confidence and skills through participation in seeking solutions. This means that schools must promote an ethos of involvement and activism, and that young people must be informed about the issues and decisions that will affect their lives.

- **Hands–On Education:** Environmental education gleefully invites experiential learning that also gives young people a chance to make a difference—restoration projects, composting and recycling at school and in the community, redesigning and greening the school–yard, to name but a few projects that have gained popularity in many schools and can be expanded to include many more.

- **Greening schools** is both a goal and tool of this form of education. Green auditing includes a critical look at the environmental impact of the school community and sets indicators for change. In this way pupils and teachers can set goals to reduce and reuse paper, add water saving devices, shift to products that are environmentally friendly, influence local shopkeepers and suppliers to stock non–toxic green products, check energy use, etc. This can be expanded to influence the wider community by looking at how these practices might spread to families and the community at large. This form of activism invites interdisciplinary team approaches and also enables young people to find sustainable solutions and influence the world they share with others.

Changing policy and structures

- **Modeling environmental practice**: The educational system in Israel can play a leading role in modeling environmental practice that can be emulated by other government bodies. The education system can implement the recycling of all its paper and supplies, conduct environmental audits of all its buildings and institutions, as well as apply socially and environmentally responsible criteria toward purchasing and use in the system. Enacting an environmentally friendly purchasing policy that promotes the use of non–toxic, recycled, and re–used products will surely give an economic boost to sustainable practices. No less, they will set the standard for the entire school system and other institutions across the country. One should not underestimate the symbolic public impact of such a move taken by the high–profile and culturally influential Ministry of Education.

- **Environmental planning for schools**: The education system in Israel can lead the way in democratizing the planning process of schools and playgrounds to include community members, school staff and young people. The goal of reducing the environmental impact of schools will require sustainable design solutions, guidelines about environmental friendly and non–toxic materials, monitoring energy and resource use, while creating spaces in which young people and the community can interact and thrive. This approach can be implemented in designing new schools and can gradually be integrated as both an educational and participatory process in older school buildings.

- **Support grassroot efforts and existing networks**: The recent rise of networks and innovative environmental programs are harbingers of change. They are valuable assets that offer experience and models of good practice that can be expanded into a comprehensive national environmental education policy. Government support should broaden the resource base and population reached by these networks, but must also beware of neutralizing or co–opting their effectiveness. It is essential that a participatory and vital environmental education reach peripheral areas and low–income populations in the interest of empowerment and social change.

- **A Task Force** headed by the Education Ministry, in conjunction with other government bodies and NGOs, must design and monitor strategies and implementation of education for sustainability. **It is essential that sustainability be adopted as a core strategic goal and a pedagogic priority of the education agenda in Israel.** This task force will set up

the mechanism for cross–disciplinary action research and the development of the necessary pedagogic approaches, linking existing nationwide programs and initiatives, and setting up in–service and pre–service training for teachers and educators. Recent trends within the Israeli educational system offer potential partners for embracing the educational values embedded in sustainability: Democracy Education, Citizenship Studies, Social Education, and "Values Education," without neglecting the "greening" of traditional disciplines such as the sciences, mathematics, languages, etc.

Concluding thoughts

Education as if the planet really mattered is a serious leap in Israel. It challenges a widespread cultural myopia that has fostered the notion that our small country is somehow exempt from the limits and actions required if sustainability is to be taken seriously. The health of our society and of the Earth's life–supporting systems cannot be deferred to some more comfortable and peaceful era. Israel's long–term flourishing is intimately intertwined with the resolution of both its internal conflicts and an attainable vision of a sustainable way of life.

Education has a crucial role to play in Israel towards building a sustainable society. Environmental education heightens the perception that we have only one future—a common future—for the peoples of this region and for the planet. Above, I have outlined some of the steps necessary to craft such an education for Israel. This will, no doubt, require a re–appraisal of our educational priorities, the allocation of resources, budgets and curricular concerns. There is no technical fix or token gesture. The real challenge posed by forging an education "as if the planet really mattered" requires first that we dare to dream. It requires that we engage both our own hearts and minds, and those of young people, in re–envisioning a future that will allow all life to flourish here. We are required to design an education that will give young people the knowledge, the skills, the caring and confidence to create that future.

Summary of key recommendations:

The environmental crisis in Israel and across the globe requires a paradigm shift in environmental education, which will articulate sustainability as a core value of the educational process. This includes a shift in **educational policy** at both the local and national levels, and the transformation of **educational practice,** towards the goal of a just and sustainable future.

- The Ministry of Education must take a proactive role, and assume leadership in implementing policy change, moving environmental education from its current, relatively marginal place on the educational agenda. Committed action can create an impact on many levels, as in the following spheres:

  Changing priorities in educational budget allocation, teaching hours, in–service and pre–service teacher training, reflecting a commitment to sustainability.

  Modeling environmental practice within the Ministry of Education—enacting an environmental and socially responsible purchasing policy, promoting recycling in all institutions, conducting environmental audits in buildings and environmental design. These steps will have a strong symbolic impact and will lead the way for other government institutions.

  Enacting an environmental and democratic planning process for all new school designs with all community members—staff, parents and children. An "environmental community audit" should be required for schools, and green benchmark programs should be enacted while setting up indicators and linking schools to Local Agenda 21. Schools should be supported in implementing sustainable practices such as water conservation, and energy reduction.

- We recommend that the Ministry of Education, in partnership with the Ministry of the Environment and NGOs, set up a Task Force to formulate a strategy for implementing a transformation of both the **content and process** of education, while engaging the hearts and minds of young people, teachers and communities towards building a sustainable vision for Israeli society. Beyond the structural changes above, we recommend the following philosophical and practical guidelines to guide the work of the Task Force:

  View environmental education as holistic in intention and practice: develop trans–curricular materials and **approaches** that involve diverse disciplines.

  Knowledge about the environmental crisis (ecology, poverty, local problems and global issues) wedded with good science, ethics, and principles of design, is a key principle for all program development.

Living lightly and responsibly on this planet, and the ethics of consumption and creating alternatives to mass global culture are very much the purview of education for sustainability.

Learning by doing: Environmental education invites participation. Involve young people in hands–on projects for environmental restoration and stewardship. Transform school grounds to environmentally and socially inviting places as part of educational change.

Empowerment: Creating a sustainable Israel requires an informed and active citizenship. Empower teachers to lead change. Promote experiences for young people to learn about real life issues in their community and in the world, and help them acquire the confidence and skills to act for change.

Building coalitions for environmental education is essential. The Ministry of Education does not have to re–invent the wheel. Good initiatives by activist groups, NGOs and grassroots networks exist already. Education for a sustainable society can be linked to existing efforts which the Ministry of Education is currently promoting: citizenship, values education, parent and community involvement, Arab–Jewish rapprochement are a few examples of relevant initiatives for the necessary transformation at the local, regional, and national level.

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Appendix I:

Three Paradigms of Environmental Education

Paradigm *Characteristics*	**Nature Conservation**	**Environmental Sciences**	**Place–based Environmentalism**
Terminology	Nature Conservation	Environmental Quality	Lifeways, Environmental Practices
Focus of Action	Nature Reserves	Public Health, Safety	Social–Environmental Quality
Environmental Problems	Biodiversity, Open Spaces, Indigenous Peoples	Air and Water Pollution, Dwindling Resources	Urban Life, Alienation, Loss of Quality of Life
Human–Nature Relationship	Nature as a spiritual source, apart from humans	Humans and Nature belong to the same system (lacks spiritual dimension)	Humans and Nature mutually interconnected (physically and spiritually)
Moral Approach	Biocentric	Anthropocentric	Cultural Anthropocentrism (Human culture rooted in nature)
Academic Fields	Ecology, Biology	Environmental Studies (Soil, Water, Policy)	Also: Architecture. Philosophy, History, Agriculture
Basic Concepts	Deep Ecology	Sustainable Development	Bio–Regionalism
Educational Approach	Sensory, Emotive, Experiential (Wonder), Nature Walks	Cognitive–Analytical; Environmental Literacy, Laboratory, Research, Policy	Relation to Place, Local Knowledge, Identity, Cultural Studies, Empowerment

PUBLIC PARTICIPATION IN THE FORMULATION OF POLICY AND DECISION–MAKING FOR SUSTAINABLE DEVELOPMENT

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This chapter deals with the manner and degree of public participation in the formulation of policy and decision–making for sustainable development in Israel. Beginning with a survey of the relevant sections of Agenda 21, it goes on to describe the current situation in Israel and the development of the environmental movement since the Earth Summit in Rio. In the next section, we examine the government's activity—which unfortunately has been focussed on reducing the degree of inclusion of non–governmental organizations (NGOs) in these processes. The chapter ends with policy recommendations to the government and suggestions for action to NGOs.

Background

Agenda 21 highlights the importance and contribution of NGOs in the development, design and implementation of sustainable policy. The Agenda in fact states that the NGOs' status must be strengthened for them to

become strong partners with the capacity to form and implement sustainable development policy.

Among other things, in the chapter entitled "Strengthening the role of Non–Governmental Organizations: Partners for Sustainable Development Programme Area," the Agenda notes the following policy guidelines:

> **Non–governmental organizations play a vital role in the shaping and implementation of participatory democracy... Formal and informal organizations, as well as grass–roots movements, should be recognized as partners in the implementation of Agenda 21.**

The Agenda recognizes that NGOs often possess experience and expertise which are vital for the implementation of environmentally sound and socially responsible sustainable development. These assets can be fully realized only if there is effective communication and cooperation between governmental authorities and voluntary organizations. This cooperation should in turn be supported by institutions mandated, and programs expressly designed to carry out Agenda 21.

On a more practical level, Agenda 21 recommends that governments take measures which focus on the establishment or enhancement of dialogue with NGOs, and on the encouragement of partnerships and dialogue between NGOs and local authorities concerning sustainable development issues. It is the government's responsibility to involve NGOs in national mechanisms and procedures for carrying out Agenda 21, with a focus on education, poverty alleviation, and environmental protection. Instrumental to these processes is that data and information are made accessible to NGOs, so that they can effectively contribute to the research, design, evaluation and implementation of programs.

As for the execution, the Agenda recommends concrete action:

> **Governments will need to promulgate or strengthen... any legislative measures necessary to enable the establishment by non–governmental organizations of consultative groups, and to ensure the right of non–governmental organizations to protect the public interest through legal action.**

The environmental movement in Israel—a decade of development since the Earth Summit

The decade since the Rio Earth Summit has seen a significant development in Israel of organizations for social change in general, and of the environ-

mental movement in particular. Whereas, in the early 1990s, the number of Israeli environmental organizations could be counted on one hand, currently over one hundred NGOs are active in Israel either on a national or a local level. These range from local action committees working on issues relating to their immediate environment, to community organizations and regional action networks, as well as national organizations dealing with development and environmental policy (relating to open spaces, water, air, transportation, the coastline). Interests also emerging are environmental education and development of environmental leadership.

This rapid and massive development can be attributed to two factors: the rapid rise in population which began following the large immigration wave from the former Soviet Union and the development of Israeli civil society. Many environmental organizations, particularly the local ones, arose as a reaction to destructive development enterprises, eradication of open spaces and coastal areas, air, water and land pollution, and the environmental discrimination of groups and sectors far from the society's centers of power. In their day–to–day work, these organizations are trying to promote sustainable agendas and solutions to Israeli society's growing needs.

Government activity—no tools for public participation in sustainable development

Agenda 21 recognizes the knowledge, experience and capability that NGOs have to offer in designing and realizing sustainable development policy, while at the same time it appreciates their contribution to democratic processes in general. Unfortunately, Israel's government does not share this opinion as to the role and capacity of NGOs to participate in processes that determine policies and make decisions.

In contrast to the democratic development and vibrant dynamism among social and environmental NGOs, it seems that the Israeli government does not view these organizations as allies for sustainable development. Contrary to its commitments in Agenda 21, the government does not encourage or coordinate dialogue between NGOs and government authorities in order to make intelligent use of the former's knowledge and capabilities. Moreover, the government creates obstacles to transparency of information, and the limitations of the existing planning process impede access to justice. Worst of all, various Israeli governments have enacted legislation which reduces the ability of the public and of civil organizations to exercise influence and to be a part of policy–making. Again, these actions are in flagrant contradiction of the Israeli Government's commitment to promoting legislation to assist NGOs' participation in these processes.

Existing laws, for the most part, address neither the issue of public participation nor that of NGO input, providing at best only a partial solution. The following examples are illustrative:

- The Planning and Building Law, 1965, regulates issues of development, planning and construction by balancing the public interest with the private interests of property owners. To this end, the law grants the public the right to object to a plan. Regrettably, though, this standing, which is granted to the public, assures that residents who wish to influence the environment in which they live are negatively stereotyped, so that they are seen as "nuisances," as "contrary," and are labeled as "objecting to every development plan," etc. The very establishment of the public's role in the planning process as that of objector precludes their constructive involvement and turns them into a negative and protracting factor in what is otherwise perceived as a positive process.

- Another central issue is the insufficient manner in which planning information is presented to the public. Since the public's role is currently cast as "objector," fair and proper publication of submitted plans would only facilitate it in fulfilling this negative role. Even so, in the current state of affairs, anyone who is not specifically trained to decipher the planning committees' miniature announcements in the newspapers, would in any event never learn about plans in the pipeline that might affect him or her immediately. Furthermore, the reality of the legal system often dictates that only citizens who are able to invest considerable finances in professional consultations and legal representation enjoy a chance of affecting construction plans. Even these interventions which, due to the law's limitations, always come too late, are unable to substantially alter the proposed plan.

Another obstacle facing resident groups is the absence of appropriate representation on the planning and building committees.

- With the exception of one slot allocated for an environmental NGO representative in the National Council for Building and Planning, there is no NGO representation in government committees that make decisions in the fields of environment and development. Nor is there any consultation process with these groups. Committees that make decisions about prevention of sea pollution, river management, experiments on animals and so on, operate without any public representation.

In addition, Israel's various governments have reduced the (already narrow) place of NGOs in the policy and decision–making systems. Two main examples should be noted:

- In the early 1990s, "Committees for Residential Development" were set up in order to meet the large residential needs of the new immigrants. The goal set for the committees (which were established through emergency legislation) was to shorten the duration of the deliberation and approval of building and development plans, with no checks or balances, and while depriving citizens of the right to have their objections heard. In many cases, this rapid approval process was used to advance plans which would not have been approved by the ordinary process. As a result, plans were approved which brought about massive environmental damage (such as the approval of plans for thousands of residential units without proper sewage solutions, or without an appropriate road system). Only a number of years later were the environmental organizations successful in bringing these committees' activity to an end.

- At the outset of 2002, the government revised the Planning and Building Law, and set up the "Planning and Building Committee for National Infrastructure." This committee's purpose is the rapid approval of development plans of the widest scope without any checks or balances (for power plants, desalination plants, national roadways, airports and so on). The resulting reality is one in which the larger the project and the more far–reaching its environmental and social impact, the shorter its approval processes. Through this process–shortening, environmental impact assessments have been utterly voided of content, and the ability of NGOs to be involved in or to influence policy–making has been severely curtailed.

Activities of non–governmental organizations

A survey of NGO activity reveals that they have been the main proponents and agents for the realization and implementation of the vision of Agenda 21. These organizations have often succeeded in influencing the Knesset (Israeli parliament) and the government to bring about a change in policy in the area of public participation. Although not exhaustive, the following section highlights several achievements of NGOs in recent years:

The Coalition for Freedom of Information was established by SHATIL in 1992 with the following goals:

- To pass a Freedom of Information Law in Israel, which would clearly state the public's right to obtain information from government offices and define clear criteria and procedures for obtaining information.

- To raise the awareness of the Israeli public and government about rights to freedom of information.

Among the members of the coalition were organizations dealing with human rights, minority rights, women's rights, the disabled, and the environment.

After an intensive, multi–year coalition effort, the Knesset passed the Freedom of Information Law in 1998, ensuring the rights of Israeli citizens to obtain information from the government. As of June 1999, local authorities that do not supply information must provide justification for their refusal, either to the person who made the request or to the court.

The Israel Union for Environmental Defense (IUED) has effectively addressed the need for greater transparency and public participation in planning through specific legal interventions. In 2001, for example, IUED petitioned Israel's High Court demanding that the Jewish National Fund adhere to open planning procedures in preparing its forestry activities, which have an enormous influence on the future of open spaces in Israel. Historically, the JNF has bypassed the normal planning process, basing its large–scale forestry activities on very general plans that have been approved by a closed government committee. The result has been that the public has had no opportunity to review forestry plans that, in many cases, have caused severe damage to the environment. The High Court's ruling declared that the JNF must cease functioning as "a state within a state," and must submit its forestry plans to the official planning committees for approval.

The Sustainable Jerusalem Coalition now has 45 member groups from all sectors of Jerusalem's multi–ethnic and socio–economically diverse public. Sustainable Jerusalem has its own civic and environmental vision, formulated by its member groups. The members of this coalition work together, both in opposing environmentally harmful planning development projects, and in creating sustainable planning guidelines for the future. In order to do this, Sustainable Jerusalem employs its own team of planners (Forum for the Future of Jerusalem), for whom the residents of the city are the clients. With Local Agenda 21 as its guiding light, thus far Sustainable Jerusalem has worked on an extra–municipal platform.

Haifa's Environmental Organizations: A coalition of the Society for the Protection of Nature in Israel, the Organization for Quality Planning and

Development in Haifa and the Carmel Public Forum has initiated an alternative masterplan for the Carmel mountain range.

Ein Kerem Residents' Committee: The residents of Ein Kerem, the birthplace of John the Baptist near Jerusalem, have prepared an alternative masterplan for the village's entire landscape basin, out of a desire to preserve the landscape, the environment and the site's historical and religious value. The plan is an attempt to prevent uncontrolled development.

SPNI's Tel–Aviv Center for Environmental Action coordinates the Green Forum, a coalition of 35 Tel–Aviv neighborhood organizations and environmental NGOs. The Green Forum has become a member of the municipality's public participation taskforce, which itself was initiated as a result of extensive lobbying by the Forum. The Forum's publication of an annual report of council voting records on environmental issues has increased the councilors' accountability and commitment to those issues. The Center's submission of a detailed alternative plan for a significant part of Tel-Aviv's coastline has led to a shift in the usual balance between the public and the municipality, strengthening the public's right to determine the area's future.

The Coalition for Public Participation in Planning: Coordinated by SHATIL, this coalition promotes citizen involvement in the urban planning and development process. With 23 member organizations, this coalition is a unique cooperative effort on the part of environmental and social justice organizations to advocate for legislative change and raise awareness about the importance of public participation among citizens and planning professionals.

Besides their contribution to the strengthening of the movements for social change and the environment, these activities have led to a certain change in attitude among Israel's decision–makers. Thus, various government ministries (mainly in the planning field) are beginning to seek mechanisms and procedures for NGO and public participation. One indicator of the government's recognition of NGOs' increased strength can be found in its official report to the WSSD: the chapter dealing with strengthening the role of the NGOs includes no account of government activity aimed at achieving this goal, but rather only that of the environmental movement itself.

Notwithstanding the impressive achievement of the local and national NGOs, their actions and influence will be enhanced if they heed the following recommendations:

- invest in developing professionalism in their fields of activity;

- open additional modes of participation in their activities and expand representation to as many sectors as possible;

- work to build a dialogue with decision–makers in order to become a substantial part of the process of designing sustainable development policy.

Conclusion and recommendations

As described throughout this chapter, the professional capability and activity of environmental organizations in Israel has strengthened considerably over the last decade.

Unfortunately, these developments were in no way a result of the Israeli government's fulfillment of the obligations it took upon itself in Agenda 21, but rather, in most cases, despite or contrary to the government position.

We recommend that the Israeli Government:

- recognize the unique role and contribution of non–governmental organizations, and create informative, reciprocal and participatory procedures for these organizations in the formulation of policy and decision–making for sustainable development;

- immediately repeal legislation intended to advance plans that negate checks and balances, and which fail to provide a role for consultation and participation of NGOs;

- Sign and ratify the Aarhus convention for freedom of information, public participation and access to justice.

MINORITIES IN ISRAEL

Raid Fadila
Alrazi Association

Marganit Ofir–Gutler*
LINK to the Environment

"Critical to the effective implementation of the objectives, policies and mechanisms agreed to by Governments in all programme areas of Agenda 21 will be the commitment and genuine involvement of all social groups."
Agenda 21 (23.1)

Introduction and overview

The principles of Agenda 21 state that the creation of a sustainable society depends on the capacity of governments to foster social equity, civil rights and democratic participatory processes. In so doing it allows all members of society to influence the decisions that will affect their lives and the lives of future generations. This is why Agenda 21 stresses the importance of accessibility to information and education, democratic access to the loci of power, equitable allocation of resources, and the strengthening and empowerment of major groups.

In light of the above, the authors of this chapter regret that the government of Israel chose not to address the topic of Israel's Arab minority in its assessment of progress, despite the fact that Agenda 21 is a document which attempts, among other things, to bolster the democratic character of the state and of society by strengthening the role of various societal groups in decision-making processes, especially minorities and indigenous peoples.

Throughout this chapter, the terms Israel's Arab and Bedouin minorities refer to Arab citizens of Israel living within Israel's pre–1967 borders, who constitute a national, ethnic, linguistic, and religious minority, and who enjoy full civil rights. By virtue of their Israeli citizenship, and despite their

* The authors would like to thank Dr. Hanna Swaid, Dr. Rassem Khamaisi, and the Galilee Society for their assistance in preparing this chapter.

self–identification as Palestinians, this population is considered distinct from the residents of the Palestinian Authority, who are not a subject of this report.

Many of the areas the government has traditionally neglected in relation to Israel's Arab minority have direct implications for the environment, and for any prospects for sustainability. The problems and inequalities, rooted in historical causes, are manifested in a range of issues, from lack of appropriate investment in physical infrastructures and inadequate response to the housing and development needs of a growing population, to the lack of recognition of Israeli Arabs as an ethnic and national minority, with their own unique relationship to the environment and environmental heritage.

One of the main messages of this chapter is that, unless policies are formulated to treat minority issues as such, little progress can be made to redress current environmental injustices. Even when progress is visible according to certain indicators, or local problems are redressed by legal action, these achievements are not sufficient to compensate for long years of neglect and discrimination. The government must adopt affirmative action policies to address historical legacies of inequality deriving from a myriad of political and cultural factors. At the same time, efforts must be focussed on empowering local Arab communities to take initiative and responsibility for their environmental problems. If residents organize, display a desire for change and present authorities with demands, chances increase that the government will respond to their needs and allocate resources for specific projects.

The present chapter assesses the present situation by describing disparities and inequalities in areas that have profound implications for the Arab sector, to understand their impact on development and the environment. We provide a few illustrations of environmental, social and cultural distress that require urgent attention and redress. The major areas worsening the environmental plight of Israeli Arabs are classed as follows: lack of infrastructures, problems of governance which create obstacles to the management of daily affairs, and inequalities in education, including environmental education and awareness. Finally, we devote a separate section to the problems of the Bedouin population of the Negev, Israel's southern desert.

In preparing this survey, we have brought together data collected from disparate sources, which allow a larger picture, however incomplete, to emerge. Several issues touched upon here have recently received further affirmation from the 2002 State Comptroller's report, which for the first time

reported in depth about governmental neglect of physical infrastructure development in the Arab minority sector. However, during the drafting of this report in April 2002, the State Comptroller's report was not available for reference.

Access to information and participation

Rio Declaration: Principle 10

Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision–making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

The State of Israel has failed to implement this principle as formulated in the Rio Declaration on Environment and Development. Israeli citizens do not enjoy complete and comprehensive access to information that is relevant to the quality of their lives. Furthermore, the opportunities available to them for influencing decision–making processes are very few, and often the legal frame for any such interventions is so narrow, that it effectively bars citizens from any actual influence.

This principle is even more true for the Arab minority in Israel, which is about 18% of the population. There is a lack of basic data and information about the quality of the environment in Arab communities, because the relevant government ministries (Environment, Health, Infrastructures) have failed to allocate resources for monitoring and research. In preparing this chapter, independent research institutions (see reference section) repeatedly pointed out the lack of basic information on environmental issues in the Arab sector. This situation requires immediate remedies.

Israel's Arab citizens participate in democratic elections, and are represented in parliament. However, this political power has remained limited, and the principle of proper representation has not trickled down or guaranteed access for Arabs to the diffuse loci of societal and economic power. As a result of a long history of exclusion from decision–making processes regarding resource allocation and planning, the Arab minority has had very little power to influence the conditions of their lives. A glaring example is that there are only two Arab representatives in the National Planning and Construction Committee, which is comprised of 32 members.

Background: Demographic Characteristics

Population Growth

In 1948, after the establishment of the State of Israel, the Arab population numbered 156,000 (about 18% of the entire population). Between 1948 and 1998, the general population increased between six and sevenfold. During these years the average annual growth rate for this population was 4%. At the end of 1998, Israel's population was 6,041,400. 18.3% were Arab (1,105,400 people).

The growth in Arab population is attributed to natural growth and the inclusion of the population of East Jerusalem after 1973. The growth of the Jewish population was due to immigration during these years. The most recent wave of Jewish immigration, for example, in 1990–1993, brought the Jewish population growth rate to 3.9% per year, with 69% of this growth attributed to immigration.

The Arab population in Israel is comprised of three religious denominations: 81.4% are Muslim (population: 899,800); 9.6% are Christians (population: 106,600); and 8.9% are Druze (population: 99,000).

Distribution according to age and gender

The Arab population is young. In 1998, 40% of the Arab population was under the age of 15 (in comparison with 27% among the Jewish population). The ratio of men to women that year was 1.03 among the Arab population, and 0.96 among the Jewish population.

Education

The level of education among the Arab population of Israel has increased over the past decades. In 1998, 19.7% of the Arab population had a post–secondary education in comparison with 4.5% in 1975. This is certainly a measure of progress. However, at the same time, it remains about half the percentage of people with a post–secondary education in the Jewish population, and this disparity has barely diminished over the years. In 1980, the percentage of people with a post–secondary education among the Arab population was 7.7%, compared to 20.8% among Jews; in 1998, 39% of the Jewish population had a post–secondary education, compared to 19.7% among Arabs.

Employment

In 1998, 43.8% of the Arab population aged 15 and upwards were employed in the civilian (non–government) work force. Fifty–two percent are either unemployed or younger than 15. The Arab communities have the highest rates of unemployment in the country. About 40% of the Arab communities have unemployment rates above 10%, which in 1998 was double the rate of unemployment in Jewish communities (5.2 % in 1998). Each year, the Ministry of Labor and Welfare compiles a list of 25 communities stricken with unemployment, out of which 18 are minority communities in Israel, and the first 12 on the list are from the Arab sector. The following table shows that the ratio of Jews to Arabs employed in white–collar jobs is 2:1. The opposite ratio pertains to Jews and Arabs employed in blue–collar jobs.

Table 1.
Comparison between Arab and Jewish workforce, distributed by occupation

Category of Occupation	*Arab Workforce*	*Jewish Workforce*
Academic	7.3	13.3
Managers	2	7
Trades and Technicians	8.9	15.5
Subtotal	**18.2**	**35.8**
Clerical	7.6	18.4
Sales	15.3	18.8
Subtotal	**22.9**	**37.2**
Professional Laborers	43.2	19.6
Unskilled Laborers	13.8	7.5
Subtotal	**57**	**27.1**

(from: Statistical Abstract of Israel, Central Bureau of Statistics, 2000)

Monthly Income

The Arab sector has the lowest levels of income in the Israeli economy, and these have barely risen at all over the last decade. An income survey from 1997 reveals that Arabs earned an average of NIS 4,211 per capita per month compared with NIS 5,918 per capita in the Jewish sector (at the time, the rate of exchange was approximately 3.5 NIS to 1 USD). The percentage of children below the poverty line among Arabs in Israel is 50% compared with 25% in the Jewish sector.

Infrastructures

Land and fiscal resources

The Arab population has grown almost sevenfold since 1948, but the amount of land available to Arab residents has shrunk. Before 1948, the Jewish population owned only 7% of the land, and about half of the land owned by Arabs before 1948 was expropriated by the state. Today only 3.5% of the land in the country is privately owned by Arab citizens. The spatial organization of settlement is characterized by segregation of Jewish and Arab local authorities (with the exception of the mixed cities). The jurisdiction of the Arab local authorities covers only 2.5% of the country's territory. Allocation of land for public use in all Arab communities falls short of the minimal national standard. Arab citizens are barred from buying land rights to 80% of the country's territory, which is administered by the Jewish National Fund and the Israel Land Authority. Around 300 new Jewish communities have been established since 1948 in Israel proper, but not one single new Arab community has been established (with the exception of Bedouin towns, that have been established albeit without the involvement of the local population and in disregard for their unique needs; see below).

The Jewish communities that were built according to regional outline plans benefited from government grants and loans, and were provided with appropriate infrastructure. Existing Arab communities did not enjoy similar governmental support for many years. Most of the Arab authorities lack infrastructures for commercial and industrial purposes, and for tourism. Due to the lack of land available for commercial zones, businesses are frequently set up within residential areas. This in turn causes severe environmental problems, as the communities lack the appropriate infrastructure to support commercial activity, such as auto–mechanic shops, carpentries, metalwork shops, stone and marble industries, brick factories, and others. These industries produce various types of waste, sewage and dust, and discharge them into residential neighbourhoods.

The Arab local authorities have suffered from fundamental problems characterized by economic weakness, financial and budgetary constraints, and lack of sufficient land resources sufficient to fulfil their needs. Two main factors are responsible for this state of affairs:

Discrimination in the governmental allocation of economic and land resources in comparison with Jewish communities of the same socio–economic ranking. Although there has been some improvement in the

allocation of resources to Arab local authorities in recent years, this does not sufficiently compensate for many years of discrimination.

Table 1: Jewish and Arab local authorities in Israel, per capita general grant (provided by the Ministry of Interior) 1972–1996. (1.00 = weighted average of all local authorities)

Year	*Jewish Municipalities and Local Authorities*	*Arab Municipalities and Local Authorities*
1972	1.81	0.21
1982	2.34	0.49
1988	3.63	1.17
1993	3.00	2.18
1995	2.31	2.07
1996	1.96	2.16

Source for Tables 1: Central Bureau of Statistics

Insufficient sources of self–income. This is due to the low income levels of residents of Arab local authorities, inefficient tax collection, and the lack of land available for non–residential purposes, which could potentially yield high local taxes. The low levels of self–income result in a significant disadvantage in the Arab local authorities' capacity to provide services and or to develop infrastructure for the benefit of local residents in comparison with Jewish local authorities.

There is a consistent, however slow, improvement in levels of per capita income in Arab local authorities (Table 2). Per capita income in the Arab sector was 20% of the national average in 1972, 24% in 1988, 28% in 1995 and 31% in 1996.

Table 2: Jewish and Arab Local Authorities in Israel, per capita income (1972–1996) (1.0= weighted average of all the local authorities)

Year	*Jewish Municipalities and Local Authorities*	*Arab Municipalities and Local Authorities*
1972	0.75	0.20
1982	0.95	0.22
1988	0.95	0,24
1993	0.95	0.25
1995	0.97	0.28
1996	0.99	0.31

Source for Table 2: Central Bureau of Statistics and the Ministry of the Interior, The Local Authorities Audit Department.

Significant fiscal disparities exist between the Jewish and Arab local authorities, in relation to income from local taxes. In the Jewish sector the majority of municipal taxes are collected from the industrial and commercial sector, while the remainder is collected from residents. The situation in the Arab sector is almost completely the reverse: 80 % of municipal taxes are supposed to be collected from the residential sector and only 12% from the industrial and commercial sectors. This relatively small commercial tax base cripples the ability of Arab municipalities to provide services. The result is a vicious circle: the municipality's inability to deliver services creates alienation, and less willingness on the part of citizens to pay taxes to an authority they perceive to be weak.

The government provides "equalization" or "balance" grants to both Jewish and Arab local authorities in peripheral areas with smaller–scale economies to help compensate for the resulting disparities in self–income. However, Arab local authorities have invariably received less from the government than comparable Jewish local authorities. During the years of Yizhak Rabin's government there was some improvement, and these disparities began to diminish. However, this trend did not continue—after the 1996 elections the trend reverted to its former state, and even worsened.

One strategy aimed at redressing these disparities has been to create joint commercial and industrial zones for Arab and Jewish local authorities, to help increase revenues from non–residential property in the Arab authorities.

Physical Infrastructure

Arab communities suffer from inferior engineering infrastructure, narrow and faulty roads that lack adequate sewage, and waterlines that are old and require restoration. In many communities, the sewage problem is solved by digging illegal cesspools. The faulty engineering infrastructure, which is a visible mark of the differences between Arab and Jewish communities, inhibits the development of Arab towns and villages. The efforts of local and national authorities to develop infrastructure in Arab communities have met with many difficulties. Some are a result of government indifference and the unavailability of resources, and some problems are a function of the circumstances and characteristics of the Arab communities themselves.

Exemplary case: Sewage

The negligence in treating the sewage problem in Arab local authorities has detrimental environmental effects extending beyond the Arab communities themselves, and therefore solving it is clearly in the common interest. A preliminary investigation of the absence of an adequate solution for the sewage problem reveals that the difficulties lie primarily in the areas of financing and disposal, as well as the complex problems of regular maintenance of these systems. The public resources available to the local Arab authorities are not exploited properly. In addition, the local authorities are not capable of solving the problem alone without assistance from the central government.

Techniques for sewage treatment have developed historically in four major stages. The initial stage is characterized by the use of cesspools, without a central sewage system. Next came the "collection" phase, which included the creation of a central sewage system, still without treatment of the sewage; in the third stage treatment facilities were added, and the fourth stage is characterized by advanced treatment techniques for exploitation and reuse of gray water.

The level of infrastructure development within most Arab communities corresponds to Stage 1—the cesspool stage, while some have developed to the point of Stage 2—collection. Only a very few communities have advanced to Stages 3 and 4, treatment and exploitation of sewage water. About 450 Arab communities in Israel, numbering half a million inhabitants, still use cesspools as a solution for sewage. This is the cause of severe public health hazards, which result from direct contact with untreated human waste. Since many Arab towns and villages are built on top of a quartz layer (permeable rock, where water can easily percolate into the water table) there is clear danger of contamination of groundwater from cesspools in these areas.

Of the many infrastructure deficiencies in the Arab communities, the sewage problem is the most severe and the most conspicuous. The current inferior state of physical infrastructure within Arab communities and the lack of central sewage systems cannot be reconciled with the goals of physical development and economic and social improvement. The absence of a regular sewage system contributes to the negative self–image of these communities and their residents. The leadership of the Arab local authorities and the Arab citizenry have identified the sewage problem as the chief physical characteristic signifying the backward state of their towns and villages, yet their attempts to solve the problem cannot keep up with the growth and development of new neighborhoods. The result is that new

neighborhoods and residences are often built with no sewage planning and the infrastructure is added later, if at all.

Representatives of the Ministry of the Environment and the Ministry of Health in the national and regional planning and construction committees usually object the approval of outline plans or detailed plans, unless they include planning for central sewage systems. Some of the Arab communities still lack approved outline plans. Others are missing detailed plans, which are a prerequisite for obtaining building permits. Some detailed plans, which do exist for a number of communities, do not include planning solutions for a central sewage system. This state of affairs makes it difficult, from the planning standpoint, to introduce central sewage solutions within Arab towns and villages.

The Ministry of Health and the Ministry of the Environment do not approve the construction of factories and workshops unless they are presented with appropriate solutions for their wastewater. Unless the sewage problem can be solved, development of industrial plants or economic enterprise within Arab communities will be inhibited, thereby preventing the expansion of employment opportunities in these communities.

Culture and Identity

Rio Declaration: Principle 22

Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Background

The forging of Israel's identity as the state of the Jewish people created a situation in which the cultural and national identity of the Arab minority received no expression in the process of nation–building. The symbols of the State of Israel are the symbols of the Jewish people: the Star of David and the Menorah, and the national anthem, which expresses Jewish national longings. Despite the fact that the Arab community makes up 18% of the population, 90% of the Arab citizens live in separate communities and are not recognized as a national, ethnic or cultural minority.

This history has engendered a reality where the basic needs of Arab citizens in the realms of education, culture, identity and heritage are ignored. Apart from the freedom to worship, no other civil rights belonging to this sphere, as recognized by Israel's Declaration of Independence, have been formally articulated or secured.

The state and the Jewish public are indeed willing to recognize and respect the cultural differences between the Arab and Jewish communities. However, this recognition has not kept the state and the Jewish majority from continually marginalizing the Arab citizenry. This marginalization is accomplished by consistent neglect of the material and cultural interests of Arabs in Israel, and by erasing their historical narrative.

Language

The Arabic language is the second official language in Israel, although the majority of governmental publications and road–signs are in Hebrew (and sometimes in English). This situation changed somewhat as a result of two Supreme Court petitions filed in 1997 by Adalah, an NGO devoted to the protection of the Arab minority's rights in Israel. After the verdict given in February 1999, about 30% of the road–signs were changed by the end of that year. Another petition was filed regarding street signs in the mixed Arab and Jewish cities. This case is still pending.

Similarly, many public notices on a variety of subjects that are put out by government agencies and local authorities (such as planning notices, tenders, and grants), are only published in the Hebrew newspapers, thus denying the Arab public accessibility to important information that could influence their lives. Adalah and other organizations monitor these problems and are waging a legal campaign to correct the situation.

Education

The State Education Law (1953) instituted two central educational streams: the secular "state–education" stream, and the "state–religious" stream. The law does not provide for a separate, publicly–supported, Arab educational trend, which would respond to the needs of the Arab population in the fields of history, culture, heritage, religion, national identity, and others. The Arab citizens of Israel who learn in state–institutional frameworks study the history, culture and religion of the Jewish people, with no focus on Arab–Palestinian culture and history. The study of Islam and Christianity is minimal as compared with the study of the Hebrew Bible.

Educational disparities between the Jewish and Arab sectors

"Education, raising of public awareness and training are linked to virtually all areas in Agenda 21, and even more closely to the ones on meeting basic needs, capacity–building, data and information, science, and the role of major groups... Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues" Agenda 21 (36)

Compulsory education (kindergarten through high–school)

Arab schools display the lowest levels of achievement countrywide. The school infrastructure and resources are minimal and the drop–out rate is very high. The State Comptroller's report for 1996 disclosed that 9% of Arab 10th grade students drop out, compared with 4% in the Jewish sector. The drop–out rate in 11th grade in the Arab sector is almost 40%, as against 9% in the Jewish sector. Only 30% of Arab high–school students pass the baccalaureate matriculation examinations, compared with 45% among Jewish students.

Despite these inequalities, not a single enrichment program has been established within the Arab sector, compared with many such programs that have been initiated in the Jewish sector. For example, nearly one third of the Jewish students in the country have participated at some point in the Ministry of Education's "Shakhar" program, which was designed to enhance students' skills and prevent them from dropping out. The program was not implemented in the Arab schools. The "Shakhar" program was established in the 1970s, and only after the Supreme Court sitting as High Court of Justice ruled in 2000 that the program must be implemented in the Arab sector, did the Ministry of Education admit that it discriminated against Arab students. It went on to argue that five years would be required to implement the program in the Arab sector. (High Court Judgment 2814/97—the Follow–Up Committee for Arab Education, et al. vs. the Ministry of Education, et al.: the petition was filed in 1997, and verdict was given in July 2000).

In addition, there are significant disparities between schools in the Arab sector and schools in the Jewish sector in the area of social and psychological counseling and support. Only 25% of the Arab schools have professional counseling staff, compared with 75% of Jewish schools. Only 32% of Arab schools provide psychological counseling, compared with 81% of Jewish schools.

Children with Special Needs: Several tens of thousands of Arab students have special needs, and only half of this number are placed in institutions or programs answering these needs. Hundreds of such children receive no services to help integrate them into the educational system, and therefore they remain at home and do not attend school.

School Infrastructures: A 1997 report by the Follow–up Committee for Educational Affairs in the Arab sector surveyed the physical conditions of 90% of its schools (200,000 students in 6,600 schools), and found that 24% of all students study in classrooms which are smaller than standard (less than 24m^2). The study also found that there is a scarcity of classrooms: 2351 classrooms are rented outside school buildings, and 441 were in such advanced physical deterioration that they were found unfit for study use. The study concluded that 8434 new classrooms needed to be built by the end of 2000. In 66% of schools there was no office room available for an educational counselor, and 44% of schools had no nurse. Eighty percent had no gym, 82% lacked a lecture hall, 33% had no laboratories, and 37% were without a library. Classrooms were found to be very crowded: 40 students per classroom on average in Arab schools compared with an average of 25 per classroom in the Jewish sector.

Pre–school (non–compulsory education)

Most pre–school education within the Arab sector is privately run in people's homes. The government has not invested in construction of pre–school kindergartens (age 3–4), as it has done within the Jewish sector. The government participates in the construction of pre–schools only in new towns numbering more than 5,000 residents, or in new neighborhoods that have more than 1,000 residential units. Since the government has not established any new town or neighborhoods in the Arab sector since 1948, it has not funded the establishment of pre–schools either. As a result only 56% of Arab children of age three attend pre–school compared to 96% of Jewish children.

Environmental education and awareness

Over the past 25 years, much has been learned about the relationship between rising standards of living and the quality of the environment. One of the important lessons is that there is a direct correlation between public awareness and understanding and improvement in the quality of life and environment. By these standards, Israel still ranks among developing countries. The Arab citizenry lags even further behind. Research also shows, however, that environmental education initiatives targeting youth are a

particularly potent and effective strategy for raising environmental awareness generally.

One of the chief avenues for youth education in Israel is the Youth Movement Council. The Council receives a budget of NIS 150,000 for environmental education. The Arab Youth Movement is not a member of this council and receives only NIS 10,000 for this purpose.

Another channel for environmental education exists in the work of the Environmental Units, a joint enterprise of the Environment Ministry and the local authorities. These units are responsible for supervising the environmental aspects of projects carried out by the local authorities, by providing consultation and guidance, and promoting environmental education and awareness. The Ministry of Environment is responsible for the professional work of these units, while the local authorities are in charge of their budgets. The first Environmental Unit to operate through an Arab municipal authority was established in 1994. At present, 35 environmental units are in operation, with an overall budget of NIS 6.15 million in 1999. Seven of the units (20%) operate within Arab municipalities, and their overall budget in 1999 was 1.24 million NIS (20%).

The Environmental Units are funded jointly by the Ministry of the Environment and the Ministry of the Interior. Up until 1998, the Ministry of the Interior adopted a policy of affirmative action in relation to the Environmental Units, and backed the Arab local authorities' financial commitment toward maintenance of the units operating in their jurisdiction. After 1998 the Ministry of the Interior stopped paying the portion allocated to Arab local authorities, as it had done previously, and local authorities, in turn, were expected to continue to fund the units out of their own budgets. However, as might have been expected, once affirmative action policies were abandoned most of the local authorities did not have the financial wherewithal to continue the funding, and as a result the Environmental Unit in the city of Nazareth was cancelled, as was the Bedouin Environmental Unit.

In the absence of environmental education, great disparities have evolved between the Arab and Jewish sectors in relation to environmental awareness. This disparity is apparent among students and in the community at large, where there is little awareness of the surrounding environmental problems and hazards, or of their long–term consequences for public health. Moreover, within the Arab sector, in towns and villages where no Environmental Unit exists, very few environmental education programs are implemented. The lack of awareness in turn breeds a sense of alienation and indifference about the cleanliness of public and open spaces in Arab towns,

where waste is often disposed of within the communities' boundaries as well as without. However, the establishment of the Environmental Units in the Arab sector is good reason for optimism, as the local awareness to problems of environmental quality has increased, particularly in those areas where the Environmental Units operate regularly.

One solution that should be seriously considered, as part of a more socially– and environmentally–sound approach, is to create Environmental Units that will integrate Arab and Jewish municipalities based on geographical considerations, rather than segregating them along ethnic–sectorial divisions. Models for this type of cooperation can be found in the regionally–based municipal environmental arms of the Environment Ministry (the Town Associations for Environmental Quality), a few of which are ethnically mixed, and yet function very effectively.

The State of Israel and the Bedouin

The Bedouin in the Negev (the southern desert of Israel) are part of the Arab minority in Israel, with a population of about 120,000. Historically, the state authorities have treated the Bedouin population in Israel as separate from the general Arab community. Bedouin citizens often serve in the Israeli military, while Israel's Arab community (excluding the Druze) is otherwise exempt from compulsory service.

Israel's Bedouin population, which until a few generations ago still led a pastoral–nomadic way of life, has been undergoing a process of sedentarization and urbanization. Half of Israel's Bedouin citizens now reside in seven communities of permanent dwellings, which were established by the state. The remainder lives in traditional settlements, which have not as yet been recognized by state authorities, and therefore lack infrastructure and services.

Basic Facts about the recognized Bedouin settlements

Town name	*Number of inhabitants*	*Type of settlement*	*Jurisdiction area (dunams)*	*Industrial zone*	*Central sewage*	*Monthly waste (tons)*
Rahat	30,500	City	8,850	Yes	Central sewage	600
Tel–Sheva	15,850	Urban	4,700	Yes	Cess-pools	
Segev Shalom	6,080	Urban	1,500	Yes	Cess-pools	120
Liqiya	7,740	Urban		No	Cess-pools	120
Ar'ara	8,640	Urban	14,500	Yes	Cess-	110

					pools	
Kseife	12,450	Urban	14,000	No	Cess-pools	90
Hura	10,490	Urban	7,800	Yes	Cess-pools	90

The state of the unrecognized Bedouin settlements is worse than that of the towns. Living conditions are inferior: most residents live in shacks or in tents with no connection to the national electricity grid or to the water lines, and with no sewage treatment or waste disposal systems.

The relationship between the state and the Negev Bedouin has been determined to a great extent by conflicts over land ownership, land–use, and the ambivalence of the Bedouin community to the processes of urbanization and modernization. Toward the end of the 1960s, the government began implementing plans for settling the Negev Bedouin in urban settlements. This project was carried out without consideration for the traditional Bedouin way of life, and without involving the Bedouin in the planning process, or in the choice of a settlement model. The urbanization program was ostensibly designed to create conditions for the regular provision of elementary services to the Bedouin population. The underlying purpose, however, was to concentrate the population in urban centers and prevent them from cultivating or settling the land, and from making property claims on land confiscated by the state. Through the policies of various Israeli governments, Negev Bedouin were systematically transferred en masse to permanent urban centers, and Bedouin lands were registered as state lands.

“The Green Patrol” was established in 1978 by the state as a quasi–military authority. The declared purpose of the Green Patrol was nature conservation but, in fact, its central activity was the eviction of Bedouin from state lands. Its purported role was to supervise state lands and protect them from invaders, and in this capacity the Green Patrol travels uninhibited throughout the Negev, enjoying the authority to harass Bedouin, destroy their homes and confiscate herds, in order to force them into permanent settlements.

The Negev Bedouin have attempted to battle the government’s scheme for confiscating land, to no avail. Among other things, the debate over land confiscation has revolved around legal questions and public issues. On the legal front, there is an open controversy between the government and the Bedouin. The government demands evidence of land ownership from the Bedouin, while the Bedouin support their claims with traditional proofs and arguments, such as proximity, custom, and cultivating practices. The

Bedouin claim that in the Ottoman period, they never bothered to register their ownership of the land in the land registry, because these procedures were foreign to the Bedouin way of life.

The Israeli legal system's neglect of the Bedouin's historical rights and traditional culture, along with the requirement to exhibit documentary proof of land ownership, have contributed to the myth that the Negev is "an empty territory to be rejuvenated." A critical examination of various legal rulings on land issues confirms that the courts routinely ignore the existence of Bedouin's historical and cultural ties with the lands in the Negev. This enables the methodical destruction of homes, allows registration of land as state property, and permits the semi–coercive relocation of Bedouin to permanent settlements.

Over the last five decades, the Bedouin population of the Negev has undergone the dramatic social transformations of modernization and urbanization. These transformations have taken a heavy social, economic and structural toll on Bedouin society, and the Negev Bedouin are in the process of losing their unique cultural identity, their past, and their heritage. Their future, too, is at risk. The status of traditional Bedouin cultural institutions has been severely undermined, because of the rapid shift from their traditional life–style to a modern, sedentary 20th–century lifestyle. These transformations have been imposed without any prior preparation in the socio–cultural realm, or in the realm of the employment economy.

Bedouin are aware that the processes of urbanization and modernization are inevitable, and despite the loss of their traditional life–patterns are eager to be integrated into the state administration and enjoy the benefits of modern planning. However, resources must be allocated, and careful thought and planning must be invested, to effect this transformation in a manner that will promote real development and improvement, but which is simultaneously sensitive to the Bedouin's unique cultural needs. Urban centers, if they are to succeed, must be planned with commercial and industrial zones to provide employment. And as long as the Bedouin community continues to be impoverished and economically depressed, the conflicts with the state over land–ownership will not abate.

Summary and recommendations

This chapter has presented only a partial overview of the conditions of the Arab citizens in Israel. Arab citizens suffer from discrimination and deprivation in nearly every aspect of their lives, both as individuals and as members of a minority. Here we have highlighted several environmental problems, which in many cases can have dangerous consequences for the

public health of Arab residents. At the same time, Arab citizens' capacity to influence decision–makers, or to take part in decision–making processes is nearly thoroughly obstructed. It comes as no surprise, then, that the most important mechanism through which Arab citizens can try to effect change is the legal system, and most often through petitions to the Supreme Court.

The foregoing pages paint a picture, which can be summarized as follows:

Environmental degradation is a serious consequence of discrimination in the social, educational and political realm, inhibiting any real progress toward sustainability.

The poor quality of **infrastructures** (sewage, water, electricity, roads) prevents improvement of the environment, and inhibits a rise in the standard of living. Investment in infrastructure is dependent on the local authorities' outline plans, and on the systemic allocation of land–uses for small and large industries.

The local Arab municipal authorities are weak, and residents feel alienated from them. Local authorities are unable to manage the various environmental problems single–handedly, and need assistance.

Above all, the educational system reflects residents' alienation from the administrative authorities, both local and national. The environmental issue suffers unfairly as a consequence of this general alienation.

Protection of the environment requires positive and constructive feedback between these three areas (infrastructure, education, local government) all of which depend on a positive sense of connection with the external authorities, most crucially with the state.

The Ministry of the Environment faces the challenge of intervening in policy in ways that can exceed "narrow" environmental interests. In doing so, it can put forth an overall civil outlook for the authorities in promoting equality.

Because of its focus on matters of environmental justice and equity, this chapter places responsibility for ending discrimination at the government's door. However, one should not lose sight of the fact that citizens have a role to play in improving the situation. Responsibility for the environment and for environmental justice must be the concern of both state and local authorities and, no less, of the public itself. Over the years, Arab municipal authorities and their residents have become characterized by inaction, and

this is a pattern that must change. The Arab public should be encouraged to develop environmental initiatives. The Environment Ministry has shown in the past that it is responsive to such grassroots initiatives, and has allocated resources for them. Although problems of waste disposal were not dealt with in this chapter, a good example of such cooperation is the Solid Waste Management project run by "LINK to the Environment", an NGO which has brought 24 Arab municipalities from the Galilee together in a source–separation waste recycling initiative. In 2000–2001 the Environment Ministry subsidized the participating local authorities at levels reaching 60%–90% of the costs of the infrastructure for this project, and funded the salary for the professional coordinator.

Recommendations

In order to implement the principles of Agenda 21, toward significant improvement of the condition of the Arab minority in Israel, it will be necessary to act simultaneously on several levels:

The Arab population of Israel should be recognized as a national minority residing in the State of Israel, with reference to the unique traditions, history and cultural heritage of this group.

Educational gaps must be reduced through appropriate allocation of resources, and the establishment of a separate publicly–supported Arab educational stream.

Arab citizens should be permitted to take up residency in any community in Israel, and land must be allocated for building new Arab towns and villages.

Outline plans must be prepared for all Arab towns and villages, and their areas of jurisdiction adjusted to meet present and future needs.

"Unrecognized" villages should be officially recognized through a process based on consensus and the appreciation of local culture and tradition.

Access to information and to decision–making processes must be ensured for all Arab citizens, through proportional representation of Arabs in national and regional planning institutions and other governmental institutions.

Comprehensive research should be conducted and databases constructed relating to environmental issues in the Arab sector (e.g. air pollution, water, and other hazards).

Sewage infrastructure and municipal wastewater treatment facilities should be developed.

Industrial zones must be developed within Arab local authorities.

New Environmental Units should be established in Arab municipalities, and the existing ones must be strengthened. A mechanism for resource allocation must be established by the local authorities, so that both old and new Environmental Units can survive financially, after the initial period of government subsidies.

The government should consider creating joint Environmental Units that integrate Jewish and Arab municipalities on a regional basis, as a strategy for strengthening their capacities.

Local authorities and residents should be empowered to instigate change from below. Environmental initiatives should be encouraged and met with appropriate resources.

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COMBATING POVERTY

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Economic policy

Agenda 21 calls for

> **"the promotion of economic growth in developing countries that is both sustained and sustainable . . ."**

Israel's official assessment takes pride in the fact that

> "[t]he government implements policies directed at creating an efficient economy, including . . . reduction of state subsidies and budget deficit, deregulation and privatization."

In other words, the Israeli government has accepted the neo–liberal doctrine adopted in the 1980s by the World Bank and the International Monetary Fund. The doctrine states that, in order to qualify for loans from international institutions and to be considered worthy investment targets, developing countries and emerging markets (Israel is considered an emerging market) are required to keep inflation low by keeping interest rates high, to decrease public spending, decrease budget deficits, deregulate markets and investments, and privatize public enterprises. As recent crises in South East Asia have shown, this doctrine sometimes causes more harm than good and does not necessarily reflect the best interests of the countries involved. According to Professor Joseph Stieglitz, Nobel Prize recipient and

chief economist of the World Bank between 1997 and 1999, the International Monetary Fund reflects the stand of the US Treasury Department, which in turn reflects the interests of Wall Street and the multi–nationals (*Ha'aretz*, October 11, 2001).

The Israeli government obediently follows the advice of the World Bank and the International Monetary Fund: it has made determined efforts to reduce the budget deficit, regardless of the whether the economy is growing or stagnating. Since the mid–nineties, when Israel began to experience a slow–down in economic growth, this policy has been harmful to low–income Israelis, especially those living in peripheral areas: Arab cities, towns and villages, and Jewish "development towns." The harm done by following the recommendations of the International Monetary Fund too closely can be illustrated by figures on educational achievements and unemployment.

Unemployment: The Government Employment Service regularly publishes figures on unemployment by locality. Those counted as unemployed include persons unemployed for six days or more who reported to the Employment Service that they were looking for work.

In June 2001, 17 of the 22 localities with unemployment rates over 10% were Arab communities; 4 were Jewish "development towns" and 1 (Acre) was a mixed low–income community of Jews and Arabs. The constituency of the high–unemployment localities is typical of the unemployment picture in recent years. The reason for the high unemployment in these localities traces to underdevelopment and limited employment opportunities in the communities themselves.

Table 1: Israeli Localities with Unemployment Rates over 10%, 2001

Locality	**Unemployment Rate**
Kufr Manda	22.6%
Ein Mahal	21.4%
Cabul	20.8%
Tamra	19.2%
Ya'fia	15.2%
Eibilin	15.1%
Shfar'am	15.0%
El–Azazma	14.5%
Tel Sheva	14.5%
Nazareth	13.8%
Rahat	13.7%
J'dida–Makhar	13.7%
Sakhnin	13.3%
Dir Hana	12.9%
Kufr Kana	12.6%

Yeruham	12.0%
Dimona	11.9%
Ashkelon	11.9%
Ar'ara	10.6%
Acre	10.6%
Maghar	10.3%
Kiryat Gat	10.1%

Source: Daniel Gottlieb, "Characteristics of Unemployed Persons in Israel—An Up–to–date Picture," Bank of Israel, August 2001, p. 13.

Educational Achievements: In 2000, 40.8% of Israeli 17–year–olds received baccalaureate diplomas—the sine qua non for college entrance. Over the last two decades, the success rate of Israeli youngsters has increased by 10 percent a decade, from 20% in 1980 to 30% in 1990 to 41.8% in 2000. (Swirski and Etkin, 2001). At this rate, assuming that the pace of improvement continues, it will take another 60 years for college attendance to become universal.

Most of the localities with success rates of 50% or higher are well–established or affluent communities in the center of the country; in all the Arab localities save one, and in 11 of the 21 Jewish "development towns" for which figures are available, the success rate was below the national average (ibid., 3). Moreover, there is a high association between the income level of residents of the locality and the success rate. This means that the Israeli education system does not, as a rule, provide a way out of poverty and does not alter the inequality in Israeli society (ibid, p. 7).

Reducing income gaps

Agenda 21 states that

> **" . . . greater equity in income distribution and human resource development remain major challenges everywhere."**

Israel's official report declares that

> "[t]he twin goals of reducing economic gaps and securing economic protection for every resident and family in times of temporary and permanent need are achieved by means of a comprehensive system of insurance and welfare programs, run by the National Insurance Institute."

While it is true that Israel has a comprehensive system of social insurance and welfare programs, and that taxation and transfer payments work to

reduce income gaps, greater equity in income distribution is most effectively achieved not through the welfare system but through the labor market. The trend over time is increasing inequality on the basis of income alone.

The table below presents the inequality of family income prior to transfer payments and direct taxes, as measured by the Gini coefficient. The higher the coefficient, the greater the inequality: 0.0 would mean absolute equality, while 1.0 would signal absolute inequality. There is a clear trend of increasing inequality.

Inequality of Family Income Before Transfers and Taxes, as Measured by the Gini Coefficient, 1979–1997

Year	Gini Coefficient
1979	0.4318
1980	0.4337
1981	0.4390
1982	0.4441
1983	0.4392
1984	0.4723
1985	0.4678
1988	0.4574
1989	0.4741
1990	0.4799
1991	0.4901
1992	0.4977
1993	0.4940
1994	0.5019
1995	0.4971
1996	0.4956
1997	0.5045

Source: National Insurance Institute, Annual Survey, 1997/98, 1999, 90.

The point is further illustrated by poverty figures. While poverty rates after direct taxes and transfer payments have not shown much change over time, poverty rates before direct taxes and transfer payments have been steadily growing: for families, from 27.9% in 1979 to 32.3% in 1999; for individuals, from 23.8% in 1979 to 31.2 in 1999; and for children, according to their parents' income, from 23.1% in 1979 to 36.7% in 1999 (Swirski and Konur–Attias, 2001).

Poverty rates provide another indicator of the income gaps between different social groups in Israel. Looking at the percentage of families living in poverty (after direct taxes and transfer payments), we find that the Arab minority in

Israel has the highest poverty rate: the disposable income of 42.9 % of Arab families positions them below the poverty line, compared with 14.3% of Jewish families (Memo from National Insurance Institute, 2001).

Poverty Rates After Transfers and Direct Taxes, 1979–1999

Year	Families (%)	Individuals (%)	Children (%)
1979	27.9	23.8	23.1
1980	28.1	24.2	23.4
1981	28.8	24.1	22.2
1982	29.8	25.0	24.1
1983	29.5	24.0	21.7
1984	30.7	25.6	23.5
1985	31.3	26.3	24.3
1988	32.6	28.0	27.9
1989	33.0	28.0	27.8
1990	34.3	30.4	31.4
1991	35.1	31.2	30.9
1992	34.7	31.4	32.6
1993	34.6	31.2	33.0
1994	34.2	31.3	34.5
1995	33.8	31.1	35.2
1996	34.3	30.3	33.4
1997	33.2	31.4	35.5
1998	32.8	31.5	36.7
1999	32.2	31.2	36.7

Source: National Insurance Institute, Annual Report, various years.

It should also be pointed out that income maintenance programs provide support payments that bring recipient household incomes only slightly above poverty level, defined as half the median income per standard person. Also notable is the fact that transfer payments decrease the percentage of Jewish families living in poverty by 44%, while they decrease the percentage of Arab families living in poverty by only about 20 percent (National Insurance Institute, *Annual Report 2000*: 56).

It also needs to be pointed out that the social safety net which Israel's official report credits with closing income gaps is undergoing a process of erosion. Unemployment compensation has been seriously reduced in recent years; it is no longer linked to the last wage, and the period of entitlement has been reduced (Fraenkel, 2001). The Director–General of the Israel

Finance Ministry has gone on record saying that, if he had his way, most income maintenance payments for persons of working age would be abolished (*Ha–aretz,* October 3, 2001). Indeed, the Finance Ministry has proposed a series of amendments, the purpose of which is to reduce maintenance payments and related welfare benefits (Cabinet decisions, September 16, 2001).

Rights of women

Agenda 21 states that, among other things, anti–poverty strategies need to focus on the rights of women.

Contending that there have been "significant advances" in the status of women, **Israel's official report** mentions legislative changes that were brought about by a Knesset Committee on the Advancement of the Status of Women. It also counts among Israel's achievements in this area the establishment of an Authority for the Advancement of the Status of Women in the Prime Minister's office "to formulate policies that eliminate discrimination against women and empower them to take their place in society." The report specifically mentions the Law for Women's Employment 1998, which "guarantees equality for women."

Indeed, the Knesset Committee on the Advancement of the Status of Women has promoted legislation designed to protect women's rights. However, the major problem in Israel is not lack of progressive legislation but lack of enforcement mechanisms. The Women's Employment Law (1954, not 1998!) mentioned in the official report does not guarantee equality for women. There are a number of new laws that mandate greater equality between men and women at the workplace, but the laws lack teeth—enforcement mechanisms. The Equal Pay to Female and Male Employees Law, 1996, which has yet to be tested in the courts (*Takdin*, August 2001), declares that female and male employees working for the same employer are entitled to equal pay in return for equal or equivalent labor, and requires equal pay for comparable work. Since Rio, the Equal Employment Opportunities Law of 1988, which bans discrimination in hiring, employment conditions, promotions, professional training, dismissal, severance pay, retirement benefits, sexual harassment and job advertising, on grounds of gender, marital and parental status, sexual orientation, age, race and country of origin, has resulted in dozens of applications to the labor courts. According to Raday, "the increase in litigation is probably less than it might have been, had not the burden of promoting feminist litigation fallen entirely on voluntary women's and civil rights organizations, feminist litigators and individual plaintiffs." This brings us back to the problem of lack of enforcement mechanisms. Raday contends that "[a]ttempts to acquire funding for an Equal Employment Opportunity

Commission have failed up to now. The costs of litigation are formidable . . ." (Raday, 2001b: 124).

The Authority for the Advancement of the Status of Women, established in 1998, has a small budget (NIS 2 million in fiscal 2001) and a staff of five. It is too early to speak about its impact.

Strengthening employment

Agenda 21 calls for

> **"direct action in eradicating poverty by strengthening employment and income–generating programmes."**

Israel's official report states that

> "[i]n 1999, the government decided to initiate a large–scale experiment for integrating long–term unemployed individuals into the labor force."

In Israel, the second half of the 1990s was characterized by economic slowdown and increasing unemployment. Under such conditions, it is difficult to imagine employment opportunities opening up for persons suffering from long–term unemployment.

Still, following the current trend, in 1999, an inter–ministerial committee was set up to explore the possibility of an Israeli "welfare reform" or "welfare to work" program. After a delegation visited the United States, Denmark, and Holland, a new committee was set up to work out the outlines of an Israeli "workfare" program (Shaviv, 1999). The committee submitted its interim report in August 2001. Among its recommendations was a proposal that, if accepted, will have an adverse effect on unemployed single mothers. Israeli law entitles single mothers with children under the age of 7 to enhanced income maintenance on the basis of an income, but not an employment test. The reasoning behind the law is that mothers of young children should be given the option of taking care of their own children.

In contrast, the proposal set forth in the 2001 interim report requires an employment test for mothers of children between the ages of 3 and 7—a clear reduction of entitlements, with no new employment or vocational training opportunities in sight.

While the recommendations of the committee have not been acted upon, due to a turf battle between the Finance Ministry and the Labor and Social

Affairs Ministry, the deliberations of the committee have already served as a backdrop for cutbacks in income maintenance and related welfare benefits. These cutbacks were included in the Budget Arrangements Bills for the State Budget for fiscal 2001 and fiscal 2002.

What needs to be done?

One way to change the unemployment picture is for the Israeli government to invest directly or channel investment into the development of Arab localities and Jewish "development towns." To date, development of Arab localities has not been on the public agenda; development of peripheral Jewish towns received its last impetus in the 1960s. Another way is to create rail transport from these communities to the commercial centers of the country. Both involve government expenditure. In recent years, infrastructure outlays on railroads have increased, but they are still less than half those on interurban highways (Swirski, et al., 2001), and they are not being made on lines that connect the center with the periphery.

The way to change the education picture is to cease the present trend of privatization of the public school system, and to invest in education in poor urban neighborhoods, Jewish development towns, and Arab communities. However, the education budget has been stagnant since 1995; investing in education will necessitate decreasing the budget deficit at a slower rate or making significant cuts in other areas. This runs counter to the government line, which contends that it expends too much, not too little, on education (For example, Cabinet Decisions, September 16, 2001). To prove this point, it presents spurious figures on comparative education expenditures in Israel and other countries, (Ben–David et al., 2000), figures that one of the major authors of the document cited has admitted are erroneous (July and September, 2000).

To prevent poverty from increasing, Israel's welfare state, including its safety net provisions, needs to be preserved.

Without an adequately budgeted and staffed Equal Employment Opportunity Commission charged with active enforcement of laws mandating gender equality, real progress in this arena will be very slow.

The most effective way to reduce poverty is to work on the long, not the short term. Israel needs to improve the public schools in low–income neighborhoods, Arab and Jewish alike, so that the next generation will have better qualifications. For present welfare recipients, more vocational upgrade programs need to be implemented. The trend of cutting welfare benefits without offering alternatives should be halted, and any changes

made in income maintenance provisions should be linked to programs designed to improve the workplace skills and job opportunities of persons on the welfare rolls.

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TRANSPORT

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Transport, Today and Tomorrow

Transport planning in Israel, despite any rhetoric to the contrary, accepts car dependence as a given, even though car dependence, using the language of Agenda 21, is "an unsustainable pattern of consumption." The rationale behind this contribution to the NGO shadow report is that car dependence is not inevitable. Since policies do not follow directly from the main problem as posited below, the chapter is divided conceptually into two main sections.

The first part will outline the current trends, with particular attention to the Trans–Israel Highway and the campaign against it, which has dominated the last ten years. The second part offers a consideration of transport policy targets in light of measures set by Agenda 21 for promoting sustainable transport systems in cities (article 7.52).

Finally, a short discussion of institutional, organizational, political and other problems will show why Israel has a long way to go towards environmentally sustainable transport. Several recommendations for NGO activity to hasten this process will be offered.

Car dependence—an unsustainable mode of consumption

Mounting Israeli car dependence

The transport system in Israel in the past decade has gone from bad to worse. According to Central Bureau of Statistics figures, in the ten years between 1990 and 2000 annual vehicle–km figures have increased by 95% and the number of vehicles has increased by 80%, while the area of roads

* This report has drawn substantially from information collected by the author for her forthcoming Israel Worldwatch report: *Transport and Environment Policy: Where are we moving to?*

available has increased only by 36% and the length of roads by 23%. The consequence is road congestion, which has been, and still is, the focus of transport policy in Israel. However, the question asked by decision–makers and professionals is 'how do we deal with a growing car fleet?' rather than 'is the increase in motorization inevitable?'

All concerned agree that car ownership in Israel is still relatively low compared to other countries with a similar per capita GDP—the motorization rate in 2000 was 220 private cars per 1000 people (compared to 172 in 1990). Furthermore, public transport use (primarily buses), which has traditionally been high, is now decreasing: the percentage of daily trips made by public transport nationally has gone down from 43% in 1984 to 30% in 1996. Following these trends, it is assumed that the motorization rate will grow: the National Transport Master Plan (NTMP) anticipates an average rate of 340 private cars per 1000 people by 2020, a rate which has already been exceeded in the larger suburban settlements. This assumption of a continued rise in car ownership underlies Israel's official report to the Rio+10 summit, as well as other major reports and plans. However, no one has asked why it is inevitable that Israel catch up with the rest of the developed world by adopting a car–dependent transport system, a highly unsustainable mode of consumption.

What are the major problems? Fuel consumption by motor vehicles has risen by 64% between 1990 and 2000 and per–capita consumption by 21%. Figures for 1996 show a per–capita fuel consumption of 0.56 tons of oil equivalent (toe) compared to an EU average of 0.65 toe and an OECD average of 0.83 toe. However, while energy use is a serious resource problem in a country dependent on imports for all of its oil products, Israel's more pertinent resource problems in the near future are water (highly vulnerable to pollutants from roads and leaks from petrol stations) and, primarily, land. Land resources are not only threatened by their direct conversion for the paving of roads and related infrastructure; but also by growing mobility in private cars, which contributes to more spread–out development of housing, retail and employment facilities—a pattern of land–use which then increases car–dependence. The problem of sprawl (and the consequent decline of city centers) is becoming the most acute environmental problem in the center of Israel, which is densely populated and suffers from a paucity of open spaces. An indication of this trend is the rise in the number of people living on the outskirts of the Tel–Aviv metropolitan area: from 582.9 thousand—23% of residents in the Tel–Aviv metropolitan area in 1995—to 754 thousand, or 27% of the residents—in 2000.

These changes in land–use patterns could explain why Israelis are driving further than before. (According to the 1996 travel habit survey the length of the average trip has grown from 9.2 passenger–km in 1984 to 13.2 in 1996—a 43% increase). However, while this may indicate an overall rise in mobility, not all of the population is equally affected: in 1999, about 45% of Israeli households did not have access to a private vehicle. The latter make fewer trips, and are dependent on public and other modes of transport. Nor has enough consideration been given to the social cost of car dependence (and consequent deterioration in public transport services) in terms of accessibility—particularly to work places. This problem has already been noted in some rural areas with high unemployment. where inefficient public transport limits access to work opportunities. Arab settlements suffer from a similar problem.

Possibly the worst social cost, though, of growing car–dependence is road accidents. The period between 1990 and 2000 has seen a 60% reduction in the rate of fatal and severe accidents per vehicle–km (so roads are becoming safer), but only a 40% drop in the rate of fatal and severe accidents per capita. A probable reason for this is the overall rise in vehicle–km, a growing proportion of which is in private cars. Furthermore, accidents strike the vulnerable populations disproportionately: 20% of those killed in accidents in 2000, for example, were over 65, although they were only about 10% of the population. In addition, 42% of those killed in traffic accidents that year were pedestrians and bicycle riders. With Israeli cities becoming more car–dependent, the disparity in power between motorized and non–motorized transport modes is increasing. Despite this, road accident policy in Israel focuses primarily on making car dependent transport safer, rather than reconsidering a system that has such a high social cost.

In sum, by opting for a car–dependent transport system, Israel has embarked on an environmentally unsustainable trajectory, limiting the resources available to future generations, in addition to denying them the choice of a preferred urban environment. Current generations already suffer from congestion, air–pollution (which is discussed in a separate chapter of the shadow report), noise and costs in human life, health, mobility and accessibility.

The Trans–Israel Highway and its opponents

When considering the past ten years, the decisions that most defined the future of transport and land–use policy were the planning, authorization and construction process of the 300 km–long Trans–Israel highway. While the route of the highway existed in the National Outline Plan for roads prior to the 1990s, it was not much more than a line on the map, until the mass immigration from the (then) USSR was used by the government as a

rationale for its development. The professed purpose of the highway is to create a new north–south corridor along the eastern border of Israel (at points parallel to the Green Line), while the central part of the highway is to become the ring road of the Tel–Aviv metropolitan area. To this end, the highway is to have ten large interchanges along the 90 kilometers of its central section, leading off to a network of lateral roads.

The construction of the highway was undertaken despite it being a major investment in road infrastructure at a time when public transport services were deteriorating and rail infrastructure had suffered years of neglect. In addition, besides the large proportion of land to be paved directly in an area which serves as a 'green lung' for the densely populated center of Israel, it is also likely that the highway will draw sprawling development eastward. These were major points introduced in a petition to the High Court of Justice put forward by the Israeli Union for Environmental Defense (IUED), demanding that an environmental impact assessment be carried out for the highway as a whole, rather than the section–by–section assessments submitted. The petition was rejected.

The degree to which the construction of the highway precludes more environmentally sustainable transport alternatives has been debated. Ostensibly, the highway is a privately funded build–operate–transfer (BOT) project, to be run as a toll road. However, the state has paid for the planning, the appropriation of land, compensation (which is constantly growing), for clearing the corridor from infrastructure and building two major interchanges. In addition, the state is responsible for the lateral roads. Furthermore, since its contract with the construction consortium commits the state to compensating up to 72% of losses in the event of a lower number of users than projected, the state now has an interest in securing a high level of road use and in prioritizing the construction of any new lateral roads required.

The NGO campaign against the highway, the first campaign of its kind in Israel, has been going on for almost ten years and is characterized by much muddling. The initial decision of the Society for the Protection of Nature in Israel (SPNI) not to fight the highway as such, but rather to attempt to limit its harmful effects, was coupled by the IUED attempt to try stop the highway, at least temporarily, in court. The consequence was that during the period when the highway was going through the official channels of authorization, the only group free and willing to campaign against it outright was the newly–founded Green Action. However, its case (at the time) against the highway was far from clear to the public and to decision–makers. Only around 1996 was a more consistent and broadly argued attempt made to

build real opposition to the highway and to increase inter–organizational cooperation. Transport policy and alternatives (particularly rail), rather than nature protection, became the focus of the campaign, and professional reports supporting the case against the highway were published. One consequence of this change was a growing realization of the need for a professional NGO promoting environmentally sustainable transport alternatives; Transport—Today and Tomorrow was founded in 1998 to fill this role.

The next step was a massive campaign initiated by the Forum for Public Transport for a parliamentary decision to reconsider the highway. Trying to draw support from various sectors, a coalition was formed bringing together social and environmental organizations. This was not a first attempt at a coalition—a previous attempt was the IUED–led Coalition for Environmentally Friendly Public Transport, and on a slightly smaller scale a coalition of women's organizations had also organized a campaign for public transport (prompted by general public concern rather than a feminist analysis). None of these attempts lasted long. However, the forum's work, coupled with a highly colorful campaign carried out by the student group *Megama Yeruka* (Green Course), began a comprehensive attempt to link together an environmental and social justice agenda. All these efforts reached a climax when the construction of the highway started and a series of attempts to prevent the work ensued, leading to daily arrests. A movement to stop the highway was set up, once again bringing in social organizations and a social agenda, and a substantial public opinion campaign was on its way until it ended, abruptly, with the outbreak of the 'El–Aqsa' Intifada in the fall of 2001.

In terms of preventing the construction of the central section of the highway, the NGO campaign has clearly failed, though it may have raised the stakes for the rest of the highway and for future projects. However, one cannot ignore the fact that transport policy and transport alternatives have become part of the governmental and NGO agenda, and various local initiatives (e.g. promoting bicycle riding) have ensued. Furthermore, time will tell whether the campaign against the highway was the catalyst for a broader social–environmental agenda and the sort of coalition–building necessary for a broad and sustainable environmental movement. It should also be noted, that the above actions relate only to the NGO national campaign against the highway. The planning and building of the highway have been (and still are) accompanied by resistance from the communities along the highway, which has shifted from outright opposition to noise reduction measures and compensation. Arab communities, in particular, have been a leading force in the local campaign, setting an important precedent by forcing the state to make land exchanges, rather than compensation, for land requisitioned.

Follow–up to Agenda 21

Since Israel is considered a non–annex I country under the United Nations Framework Convention on Climate Change (UNFCCC), it has not been required to reduce carbon emissions. Israel's national report on climate change submitted to the conference of the parties of the UNFCCC merely provides a list of (non–prioritized) recommendations for reducing emissions from transport with equal emphasis on technical and transportation control measures. Lacking precise targets, one can only assess Israel's transport policy in light of a general aim to limit the consumption of resources over time, without harming the overall accessibility of the current generation. A three–level approach should start with reducing the overall need to travel, by integrating land–use and transport planning, promoting alternatives to the private car and, finally, by securing the most eco–efficient transport technologies (e.g. clean buses, clean and alternative fuels, etc.). This type of approach would be in line with the Agenda 21 suggestion to "re–evaluate the present consumption and production patterns in order to reduce energy and national resources" concerning urban transport systems (article 7.52(f)).

In the absence of an overall approach, the following section will focus on Israel's more narrow policy targets, as set by a 1997 governmental decision on measures for dealing with road congestion and prioritizing public transport. These targets will be assessed in view of measures set by Agenda 21 for promoting sustainable transport systems in cities. For the sake of brevity, examples are partial and for illustration only.

The first measure to be considered is the suggestion that land–use and transportation planning be integrated to encourage development patterns that reduce transport demand (7.52(a)). This approach has been promoted by the NTMP and the previous National Outline Plan (NOP 31), which focus on increasing densities in existing settlements in order to support viable public transport, but has yet to be translated into local decisions. The new National Outline Plan (NOP 35), which is supposed to set the planning agenda in Israel for the next 20 years, has the specific agenda of controlling sprawl in the center of Israel. However, its authorization process, initiated in 1996, has been held up time and again due to the diverging interests of different sectors, groups and politicians.

In the meantime, much could have been done in terms of parking policy within the larger cities. Current parking standards in urban centers (which date back to 1983) have a negative effect on the reduction of car use. The 1997 government decision noted above specified that the Minister of Interior take steps to reduce the number of parking spaces to be built in the center

of big cities. No target was set, but a new parking standard is being finalized, which is fashioned along the Dutch model and aimed at a strict reduction in the number of parking places near public transport stations in city centers. In Jerusalem, a new standard was confirmed, limiting parking places for business and retail in the city center in order to support the first light–rail line. The Tel–Aviv municipality, on the other hand, has opposed any changes in parking standards until viable public transport alternatives exist, for fear that businesses will move to the outskirts of the city/ metropolitan area.

This reasonable objection leads to Agenda 21's next suggestion to "adopt urban transportation programs favoring high–occupancy public transport" (7.52(b)). Here, too, practice lags behind Israel's national planning objectives as set by the previous National Outline Plan (NOP 31), which requires priority for public transport systems (both buses and rail), particularly in the metropolitan areas. Over the years, rail has notably **not** been a priority in budget allocations and most of the state investment in public transport has been in subsidies for the bus system. The government's 1997 decision was followed by a growing investment in rail during the past four years, but it is by no means adequate to cover a serious lag in investment. Israel Rail (the Israeli government–owned rail company) has invested available resources in improving and upgrading existing lines and has increased the number of passengers (there has been a four–fold growth in passenger–km between 1990 and 2000), but it lacks the means for the major relaying and rerouting projects. The position of the budget department of the Ministry of Finance regarding the major projects has been to promote private–sector involvement. An example here is the long–awaited relaying of an extension to the northeastern bound suburban rail line in the Tel–Aviv metropolitan area. This was to be a model of a rail service built and operated by private investors. After endless debates and an NGO campaign, a decision was finally reached in August 2000 whereby the government would fund the infrastructure work and the operation of the service would be contracted out.

Metropolitan rail programs have not fared much better. For many years now, a debate has been going on regarding the nature of the mass–transit system in Tel–Aviv and the surrounding municipalities. Finally, in 1996, the government set up a company with the task of planning and promoting the transport system. However, a change in government brought a more skeptical Minister of Finance who halted the programs temporarily. Then, in 1999, the company came out with its plan for a light–rail system that raised objections from the municipality (which, in turn, favored an underground system). Only in 2000, was a compromise reached. The prolonged process was due not just to lack of funding, but also to the diverging agendas of the different adjoining municipalities. In Jerusalem, where there is one

municipality, as opposed to several in the Tel–Aviv area, the latter problem was avoided and the selection process for a company that will build and operate the first light–rail line is underway, albeit with several open questions regarding its interface with the existing bus service.

Israel's official report to the Rio+10 summit notes that metropolitan mass–transit systems are being planned, but fails to mention how long the process has taken. In addition, throughout this period public transport efficiency and patronage could have been increased by improvements in the existing bus system. Israel's professed policy in the 1997 government decision was both to prioritize buses by building bus lanes and to re–plan bus routes. At least 60 million NIS was to be allocated each year to dedicated bus lanes. In the yearly budgets, these funds have indeed been allocated. However, they are not fully utilized, due primarily to political resistance from local authorities who do not wish to antagonize car drivers and shop owners.

While initiatives in mass–transit alternatives to car use may be progressing, albeit slowly, policies in accordance with Agenda 21's suggestion that countries "encourage non–motorized modes of transport by providing safe cycleways and footways in urban and suburban centers in countries as appropriate" (7.52(c)), are insufficient. Israel has not taken on non–motorized transport as a national issue: the NTMP does not consider walking and cycling to be major transport modes and there is no relevant section in the national budget (although this in itself is not an indicator). There is also no national data on non–motorized travel habits. One finds some programs for bicycle lanes in a few municipalities including Tel–Aviv, but the initiative is local, often the result of NGO pressure. Pedestrian zones are just as scarce, while obstructions on sidewalks, including parked cars, are prevalent.

A final Agenda 21 suggestion that is of relevance to this report is for countries to "devote particular attention to effective traffic management, to efficient operation of public transport and to maintenance of transport infrastructure" (7.52(d)). The 1997 government decision required that the Ministers of Transport and Finance set up a committee to consider the pricing of road infrastructure and particularly congestion pricing. In the 'Economic Arrangements Law' accompanying the 2000 budget, an article was passed allowing the Ministry of Transport to convert new lanes/roads into high occupancy toll (HOT) lanes. A pilot project is planned for sections of the Tel–Aviv–Jerusalem highway leading into Tel–Aviv and into Jerusalem. HOT lanes could be justified if properly integrated with public transport and the proceeds earmarked accordingly, but as of December 2001 the pilot

project has been put on hold by the Minister of Transport, who is concerned about the social implications of charging for the use of a road.

Concerning the efficient operation of public transport, the main instruction of the 1997 government decision was to set up a public transport directorate in the Ministry of Transport in order to increase competition among public transport providers. The directorate is up and operating with alacrity, considering the Ministry's lags on other fronts. However, the contribution of this liberalization process to increased efficiency is debatable. A major requirement for an efficient system is coordination between public transport services (regarding timetables, information provision, ticketing, transfers between services, etc.). Unfortunately, the history of bus–bus and bus–train coordination in Israel is not good, and without public transport authorities (national or metropolitan) to coordinate services, the situation is unlikely to improve. Unless such measures are introduced, it would appear that the government's objective is the reduction of state subsidies for public transport, rather than the overall efficiency of the public transport system.

Overall assessment and recommendations

If policy documents promote public transport alternatives, politicians are for rail and everyone would like to reduce congestion, air and noise pollution and road accidents, why is there no notable move away from the current trend toward a car–dependent system? To start with, a combination of conflicting policies and hidden subsidies contributes to continuing car dependence:

- Urban sprawl has been encouraged by a rush during the 1990s to free agricultural land in the center of Israel for development, after decades of a strict policy preventing the use of land for non–agricultural purposes. The reasons for this are a steep rise in housing prices in the early 1990s threatening much–feared inflation, coupled with an opportunity to help settle some of the growing debt incurred by agricultural settlements based on the proceeds from the re–designation of their agricultural lands.

- Israel's revenue benefits from high, non–earmarked, taxes on the purchase of cars and car parts.

- A relatively low tax on petrol (compared to European countries) may also encourage car use (though a higher tax on petrol on its own is not a socially equitable policy to limit car use).

- Perks, and related tax concessions, such as company cars, free parking places provided by employers and/or car upkeep allowances given to (mainly white–collar) workers encourage and/or subsidize car use.

These and other conflicts between different government policies and agendas are indicative of the lack of system–wide commitment to environmentally sustainable transport and/or legislation to that effect.

Furthermore, transport planning has traditionally been modal, that is, roads are planned independently of other modes of transport and vice versa. The planning of the Trans–Israel Highway independently of other transport systems is a prime example. As the State Comptroller has noted, the decision was not made in light of a comprehensive transport plan. It is at the interfaces between transport modes that transport policy in Israel fails the integration test. No matter how much money is invested in transport alternatives, without a system that enables the traveler to pursue a 'seamless' journey, there is little hope of offering a viable alternative to the private car. However, while some efforts are being made, 'park and ride' facilities are rare, feeder bus services to the train sporadic, many transit stations are not efficient and the interface with non–motorized transport (e.g. bicycle–bus, bicycle–train) is almost non–existent.

This has not been helped, over the years, by the institutional split between authorities responsible for the various aspects of transport planning: the Ministry of Transport, Israel Rail, the state's road infrastructure company and, more recently, the Trans–Israel Highway company. Only in 1999 did the newly–elected government finally bring these units together under the auspices of the Ministry of Transport, thus opening a window of opportunity, but which has yet to bring about a real change in the ministry's overall approach.

What can be done? While several (governmental and non–governmental) reports on environmentally sustainable transport policy were studied for this chapter, they do not differ substantially when it comes to recommendations. We do not lack ideas for policy initiatives. Rather, what we face is an **implementation gap** between plans and/or government agendas, and the decisions made in practice. A series of institutional, organizational, political and other failures needs to be overcome

This is a window of opportunity through which NGOs can, and have, become involved. For example, NGOs can, and should, require transport impact assessments of local land–use changes. While such assessments are traditionally 'traffic' rather than 'transport' assessments, the Ministry of

Transport is reconsidering the character of these reports, including the place of non–motorized transport. NGOs are also insisting on inter–modality in transport decisions, as has been the case in Jerusalem where the SPNI has used the municipality's professed support for mass–transit to combat initiatives for a new road. However, this sort of activity emphasizes the need for stronger integration on the local NGO front between activists and professionals.

A second area for recommended action relates to **non–motorized transport**. Lack of a national agenda has meant primarily initiatives by local authorities, thereby enhancing the role of local groups such as "Tel–Aviv for Bikes". More can be done here on the level of local coalition–building, by making the obvious connection between such policies as traffic calming and pedestrian zones to road safety and the mobility of particularly vulnerable groups such as the elderly and children.

A further conclusion relates to the major role of **sprawl** in any discussion of environmentally sustainable transport. Considering the current government's attitude towards farmers' rights to develop land that is leased to them, the building of new settlements in Israel and the future of the new National Outline Plan, sprawl is clearly a major issue for environmental activism in the next few years. It is also a possible angle from which to continue the struggle against the detrimental effects of the Trans–Israel highway.

Finally, the future of the struggle against the **Trans–Israel highway** is being debated by the NGOs involved, and it is not the role of a single contributor to settle this point. However, since the northern and southern extensions of the highway were never really its selling point, except for rhetorical purposes, they should be reconsidered. At the very least, a re–evaluation of the actual costs accrued to the state by the highway should be conducted and made available to the public.

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PROTECTING AND PROMOTING HUMAN HEALTH

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This report refers to each of the program areas covered by Chapter 6 of Agenda 21, similar to the format of the official governmental report (June 2001). It attempts to critically summarize the progress made in Israel in the last decade, referring to the objectives and the list of relevant activities of Agenda 21.

Meeting primary health care needs

Israel has a high quality health system with qualified medical and para-medical staff. The Ministry of Health, through its regional offices, is responsible for monitoring and controlling sanitation, food and water safety (drinking and swimming water). The Ministry of Health is also responsible for the establishment of health facilities nationally.

Life expectancy at age 0 increased, among women, from 78.4 in 1990 to 80.3 in 1998 and among men from 74.9 to 76.1(1).* Similarly, life expectancy at age 75 increased both in men and women (from 10.7 in 1990–94 to 11.1 in 1994–98 for women and from 9.6 to 10.0 for men). As to the meeting of needs, the rate of licensed beds for long–term care increased from 1.48 per 1,000 persons at the end of 1990, to 2.86 per 1,000 at the end of 2000 (1).

* As distinct from the rest of this report, this chapter uses a style of endnote referencing known as "Index Medicus," particular to medical academic texts.

Since 1995 the National Health Insurance Law provides standardized medical care (through a "basket" of services) for all citizens and covers 100% of citizens. The list of drugs and technologies that are covered by the National Insurance is updated every year. Primary care services, which are provided either by the Ministry of Health, or by health insurance companies (sick funds) or NGOs, are accessible to all citizens. "Mother and Child" health care facilities are located in every city and town (2). Nurses and doctors of the Regional Health Offices provide part–time services to rural areas.

Despite the coverage offered by the National Insurance program, the personal health care expenditure (excluding private services) is 26.9% of the national health care expenditure (3), which is one of the highest rates among OECD countries.

As the National Insurance does not cover all the medications and technologies, there are a variety of complementary insurance programs, which not all citizens can afford. This may in turn intensify the inequalities in health of different population groups.

Israel declared the acceptance of the WHO strategy of 'health for all', though specific targets for "Health 21" were not defined. As a result, there is no strategic plan for improving health, there are no health indicators (except for mortality and morbidity) for monitoring progress and there are no mechanisms for supporting coordination between health and related sectors. There is a special fund in the Ministry of Health, however, for health promotion activities in the community.

Health promotion has been developing in Israel over the last decade, both conceptually and practically. Primary care settings provide preventive and health promotion activities, including health education. The central issues are prevention or early detection of chronic diseases (cardiovascular disease, breast or colon cancer) or promoting healthy lifestyles (reducing smoking, improving diet, increasing physical activities). In rural areas, health education is provided mainly by the regional offices for health, who deal with personal hygiene and sanitation as well.

A joint committee of the Ministry of Education and the Ministry of Health determines the curriculum of health education in schools. A network of health–promoting schools is coordinated by the Ministry of Education.

Several voluntary organizations have been dealing with health issues for many years. Such organizations engage in fund–raising and allocation as

well as complementing the activities of public services. Many self–help groups deal with specific health problems. These groups are coordinated by the Israel Center for Self–Help, which is supported by the Ministry of Health.

There are no national mechanisms for improving coordination between health and related sectors, nor are there any which facilitate citizens' participation. Some examples of good practices can be found on a regional level, as well as on the local level (e.g. Healthy–Cities Network).

Public health research has been developing for several decades in Israel. There is a tradition of multi–disciplinary cooperative research. Environmental health research, however, has yet to be developed.

Control of communicable diseases

Israel has established a nation–wide immunization program which has succeeded in eradicating polio and measles (since 1990 not a single case of measles or polio were reported to the Ministry of Health registry). Infectious diseases have become a very minor contributor to infant mortality in all parts of Israel.

The vaccination coverage of children aged two years (MMR, DTP, Polio, HBV and Hemophylus Influenza B) is over 90% in all population groups (1). Vaccination of infants for Hepatitis A was introduced as a national program in 1999. Until that year it was too expensive to be used by children of lower social classes who were at a higher risk for contracting the disease.

An increased incidence of tuberculosis was noted during the last decade (reaching an average annual incidence rate of 7.9 per 100,000 persons during the 1990s compared to 5.5 in the 1980s) (1). Special clinics for direct treatment (DOT) have been set up and are operated by the Ministry of Health.

At the end of 2000 there were 207 persons with AIDS in Israel, out of 701 who were ever diagnosed in Israel (1). Fifty–one new cases were diagnosed in 2000, compared to an average of 40 per year during 1989–1995 (4). Health education for prevention of HIV infection is provided both by the education and health systems, as well as by voluntary groups.

Recently, there has been evidence that inter–ministerial efforts to combat a communicable disease (West Nile Fever), which caused mortality last year, have been successful.

Protecting vulnerable groups

National and local initiatives focus on specific vulnerable groups (children and youth, women, handicapped, new immigrants, elderly). Some deal with data collection and dissemination for increasing public awareness, while others provide counseling, training or treatment.

There is no national policy for populations with special needs and no inter–ministerial national policy or regulated coordination between initiatives.

- Prenatal care services have been well–established for several decades. They are provided to every community throughout the country, either directly by the Ministry of Health or by the health insurance companies. Over 90% of the pregnant women in Israel use these prenatal care services (2). 70% of the women who gave birth in 1998 used the Ministry of Health's prenatal care (2). Programs that promote breast–feeding are implemented in most of the obstetric wards of the general hospitals, as well as in the 'Mother and Child' Services of the Ministry of Health.

- The last decade has seen increasing rates of risky behavior among youth in Israel. For example, use of drugs among students 12–18 years old increased from 4.9% in 1992 to 9.8% in 1998 (5). Education and counseling programs for prevention of risky behavior are implemented through the formal and informal education systems. The Ministry of Health provides school health services, for students of kindergarten to Grade 9, which supplies vaccinations, growth and development testing, as well as screening and early detection of vision and hearing problems. The Ministry of Education, Ministry of Health, Ministry of Labor and Welfare, health services providers, the Israel Association of Community Centers and local authorities, all are involved in health education programs. These programs are not always coordinated. In some of the programs, children are involved in planning and implementation. There are some good examples of multi–sectoral programs, which are community–based (e.g., "Safe kids" youth counseling centers).

- Many women's health centers are operated by various health or social services. In most cases these are the initiative of the service provider, rather than a planned, coordinated community program in which local women's groups are involved in identifying their needs. Violence towards women has increased in the last decade (or else reporting has increased, possibly because it has become more socially legitimate to do so). Between 1990 and 1998, 196 women were murdered, and two–thirds of the victims were murdered by their partner or by another family member

(6). In response, the number of shelters for battered women increased from 6 in 1993 to 13 in 1998. The Israel Association for the Advancement of Women's Health (7) was established in 1994 and is dedicated to advocating women's health issues, health education and leadership training and empowerment.

- The percentage of the elderly population (aged 65+) increased from 9.0% in 1989 to 9.8% in 1999 (1). 30% of the elderly population receives income completion benefits from the National Insurance Institute (8). Strategic plans for caring for the elderly have been under development over the last few years, mainly by local authorities in cooperation with the JDC–Brookdale Institute of Gerontology and Human Development. There are many local initiatives for caring for the elderly. One example are the programs for the prevention of falls that the community health services developed and implemented for their insured elderly population.

- During the years 1990–99, 956,319 new immigrants arrived in Israel (amounting to a 20% growth in Israel's population). Among these 86% came from the former USSR and 4% from Ethiopia (8). Absorption of such a large wave of immigration in such a short period of time, together with their special social and health needs, required combined efforts of official health services, local authorities and voluntary groups. Many local initiatives for social inclusion and mutual help for special immigration groups were established.

- The minority groups in Israel, mainly the Arab population, represented 18.7% of the total population in 2000. This sector of the population lives mainly in rural areas. There are still inequalities in health between the Arab and Jewish populations. The infant mortality rate, which has been decreasing over the years across all population groups, still has a constant rate ratio of 1.9 (7.5/1000 life births among the Jewish population in 1992, compared to 14.3/1000 among the Arab population. In 1999 both rates decreased to 4.5/1000 and 8.4/1000, respectively) (1).

- The National Insurance Institute (NII) is promoting a program that enables local governments and institutions to provide the handicapped with full and equal access to municipal facilities and services. By providing up to 80% of the cost of renovations of old buildings to make them accessible to handicapped persons, the NII program will complement provisions outlined in the Planning and Building Law (1965) that require full accessibility to all newly–built structures.

Meeting the urban health challenge

Ninety–two percent of the Israeli population lives in urban localities (8). The crowding index (persons per room) is higher among the rural population than in the urban, and higher in the non–Jewish than in the Jewish population (1.5 and 0.91, respectively) (1).

As part of the centralized system of government in Israel, different initiatives for improving the quality of life are offered by different ministries to local authorities for implementation, in exchange for matching funds. Most initiatives require a steering committee, planning and data collection. In many instances these initiatives are not coordinated within the municipality, which results in overlapping themes and committee members. In the last few years, however, there has been an increasing awareness of the need for partnerships and coordination of activities.

The "Healthy Cities Network," which has operated in Israel since 1990, provides examples of partnerships and coordination within the municipalities, as well as networking for collaboration and the exchange of models of good practices between municipalities. All 37 member cities and towns have adopted the principles and strategies of "Health for All," "Agenda 21," and an equity agenda. Members develop active collaboration with service providers and citizens in the city. They are committed to designing their health development plans on the basis of a city health profile. Members use data collection from different sources (for the last few years The Central Bureau of Statistics has provided more data on a municipal basis) for describing the health, social and environmental conditions in the cities. Members identify the population's needs, inequalities in health and the aspirations of the citizens as a basis for inter–sectorial discussions and a participatory process for priority–setting and planning for intervention. The Healthy Cities adopt "enabling and mediating strategies" and are committed to creating a supportive environment for health. Some of the Healthy Cities pioneered the implementation in Israel of new regulations to ban smoking in public places (August 2001). Most of these cities have health–promoting schools and health–promoting community centers. Haifa, an active member of the network, conducted a comprehensive environmental survey in the mid–1990s, sponsored by the European Union. The output was a "Green Strategy," a multi–annual program, which is now being implemented.

Environmental impact assessment has become a mandatory procedure for public urban planning. Health impact assessment, however, is not yet part of the planning process.

A new initiative is the multi–disciplinary forum for community development, aimed at promoting equity through social development, which has been operating since 1999, and aims at extending its activities in scope and scale.

Recently, a pilot project of "sustainable cities" in Israel has been undertaken as a joint effort of ministerial and NGO bodies.

Reducing health risks from environmental hazards and pollution

Several ministries are involved in regulating and monitoring the quality of air and water, food safety and the control of hazardous substances. There are regulations about exposure to hazardous substances, noise, ionizing and non–ionizing radiation. The Governmental Report provides a wealth of details under these headings. The following section supplies some additional important information.

Urban air pollution is monitored by the Ministry of the Environment and by local authorities, mainly in big cities. In some places (Haifa) the level of pollutants is presented on–line on the city web site—enabling transparency of the information. There is very limited epidemiological research relating air pollution to morbidity and mortality in Israel. However, the construction of the first coal power plant in Israel, which was monitored by environmental, agricultural and health systems, created the occasion for a prospective study of schoolchildren's health. This study demonstrated a significant rise in the prevalence of asthma during 9 years of follow–up, which was not associated with the power plant's location (10). Increase in Asthma mortality was noted between 1971 to 1990 (11) only among people aged 5 to 34 years. That increase is similar to other developed countries.

A Ministry of Health report, "Geographical Mapping of Malignant Diseases in Israel: 1984–1999", was published in 2001. This report initiated discussions in local authorities and among the general public about the possibility that environmental factors were associated with such diseases. No analytical research has been carried out so far to support these hypotheses.

The Ministry of Health is responsible for the **quality of drinking water**. Drinking water is monitored by mandatory testing for total coliforms as well as chemical contaminants. The improvement in the quality of community water supplies was demonstrated by a decrease in the number of outbreaks of waterborne gastrointestinal disease from 1976 to 1995, with zero outbreaks reported in 1996–97 (12). Only in the last few years, have authorities taken action towards cleaning up the rivers. Yet industrial wastes

continue to be discharged into rivers and into the sea. The carcinogenic effect of the Kishon River is currently being investigated.

Prenatal exposure to lead was analyzed in newborns in Israel (13) and the analysis found that there is no risk of lead exposure.

Traffic road accidents (the fourth leading cause of death) are a major problem in Israel. Although there has been a decrease in the absolute number of deaths (507 in 1992 to 461 in 2000), there was an increase in the number of vehicles and number of drivers (14), and the number of accidents and injuries are increasing. It is important to note that since 1997, the number of accidents within urban areas has decreased. National initiatives for preventing road traffic accidents should focus now on promoting safety on highways.

There has been a growing awareness among the population about the environmental influences on health. NGOs and activist groups have taken many initiatives toward the preservation of green open spaces, reduction of air and water pollution and the preservation of energy. However, research in environmental health has yet to be developed.

Notes

(1) *Health in Israel* 2001, selected data, Ministry of Health.

(2) *Mapping of Public Ambulatory Health Services by Settlements in Israel, 1999*, Ministry of Health, Jerusalem, June 2000 (Hebrew).

(3) *International comparisons in health systems, OECD countries and Israel, 1980–1998*, Ministry of Health (Hebrew).

(4) *Health in Israel,* selected data, Health Information and Computer Services, Ministry of Health, Jerusalem 1996.

(5) *Mental Health in Israel,* Annual Statistics 2000, Ministry of Health.

(6) *Women's Health in Israel 1999, A Data Book*, edited by Anneke Ifrach MA, MPH.

(7) www.la–briut.org.il

(8) www.btl.gov.il

(9) www.cbs.gov.il

(10) Goren A.I., Hellmann S. "Has the Prevalence of Asthma Increased in Children? Evidence from a long term study" in *J Epidemiol. Community Health* 1997, 51:227–32.

(11) Livne M., Weissgarten J., Stav D., Wilf–Miron R. and Katz Y. "Asthma mortality in Israel 1971–1990." *Ann. Allergy Asthma Immunol.* 1996. 76:261–265.

(12) Tulchinsky T.H., Burla E., Clayman M., Sadik C., Brown A. and Goldberger S. "Safety of community drinking–water and outbreaks of waterborne enteric diseases: Israel, 1976–97." *Bull. World Health Org* 2000, 78:1466–73.

(13) Amitai Y., Katz D., Lifshitz M., Gofin R., Tepferberg M., Almog S. "Prenatal Lead Exposure in Israel: An International Comparison." *IMAJ* 1999, 1:250–253.

(14) *Road Traffic Accidents in Israel 1995–2000*. Ministry of Transportation, 2001 (in Hebrew).

CULTIVATING AN INTERDISCIPLINARY APPROACH TO ENVIRONMENTAL AWARENESS

Developing Environmental Awareness through Art

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Introduction

The following chapter responds to the governmental report's section on "Environmental Education and Promoting Public Awareness," by examining the role of the arts in this area, and in seeking ways to incorporate Israeli artists in efforts to solve environmental problems. Two important questions guide our discussion:

- Does an interdisciplinary framework for cooperation truly exist, as the governmental report claims?
- Can the artist become a link between people and the environment and reclaim her or his traditional role as a social and cultural agent?

Our argument, that the artist's role should be promoted and adopted as a means toward environmental progress, introduces possibilities that are not

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yet imagined in current environmental policy in Israel. In this sense, the present chapter is more than just a critical analysis of the government's report. We contend, furthermore, that as an issue for environmental policy, these questions should be presented from an inherently environmental standpoint, and not only from an artistic one.

Our central argument is that any interdisciplinary cooperation, which the governmental report claims to favor, will be incomplete unless the role of artists is enhanced in these processes. This will be achieved not merely by including artists in groups of professionals who research, restore and reclaim damaged environments, but chiefly through an authentic integration of an artistic viewpoint into the field of environmental study. Conversely, an environmental approach must be introduced within art studies. Serious interdisciplinary cooperation on environmental issues—involving artists, scientists, humanists, planners, activists, and governmental bodies—does not exist in Israel. We argue that until this integration is achieved, dichotomous patterns of thinking, which separate science and governance from art and culture, will continue to prevail. Visual art has the power to transform the way individuals think about the environment, as we illustrate in a few historical and contemporary examples. Artists can play a major role in mediating between the community and scientists, and between citizens and their environment.

This chapter concludes with practical suggestions for changing the current situation, at the level of government and of NGOs. The course of action indicated includes: official incorporation of artists in decision–making processes; allocation of resources for ecological art projects; hiring of artists as consultants to governmental projects; the creation of formal programs for professional training for artists on environmental and planning issues; as well as the creation of venues for study, exhibition, and creative work.

The current situation

The environment has no face. It has no image. If an environmental problem lacks a face, the existence of the problem is diminished. Jewish culture is at a certain disadvantage where images are concerned. This is reflected even within the educational system, where a great discrepancy exists between written materials and contemporary visual material available for students. In the age of channel–surfing, this discrepancy is all the more apparent.

Take, for example, the problem of illegal mining of sand: if the public is not presented with a mirror that reflects the problem visually (through photography, filmmaking, poetry etc.), they will not be aware of the problem, and consequently the intensity of their response will be much diminished.

Similarly, the public does not have an intimate knowledge of local biodiversity. The life of the zebra is more familiar to most people than the life of the local gazelle. Art has much to contribute to this sort of familiarity and experiential, local connection. Even the most proficient scientist would not succeed in communicating the severity of an environmental problem to the public, because she or he would not know how to evoke a mixed response from the audience, or provoke a deep sense of belonging or the feeling of "Genius Loci." This can be the role of an artist, a director, or a writer. Art has the power to impact the environment, as well as raising awareness of environmental issues.

Decision–makers in the environmental realm in Israel do not involve artists in decision–making processes. Engineers, architects, and even landscape architects do not, as a matter of routine, engage in dialogue or collaborative efforts with artists. Even scientists, ecologists and environmental consultants do not view artists as partners in the process of environmental problem–solving. No venue exists in Israel for training in the fields of Eco–Art, involving planning, conservation or reclamation, so that they might later join an existing interdisciplinary framework. Although ecological art can offer unconventional solutions to environmental problems, and has the status of a recognized profession in some places in the United States, Germany and England, in Israel it is still not recognized as a discipline in its own right.

The **Israeli Forum for Ecological Art**, an NGO formally founded in 1999, is working to gain recognition for this discipline nationwide, in the spirit of Agenda 21, which calls for better communication between scientists, decision–makers, and the public, as part of environmental policy–making. In this context, artists constitute more than merely a certain type of public or a particular segment of the public, but are a necessary and vital link for remedying the absence of public awareness, as noted in Agenda 21. Art must be seen as an invaluable asset to society. The Israeli Forum for Ecological Art has been taking an increasingly active role in working for the environment and towards the promotion of the four–way dialogue that is so absent still: artist–scientist–community–establishment.

Background

History can offer examples of the artist's contribution to environmental awareness. In nineteenth-century United States, artists who drew distant landscapes were able to influence decision–makers, by fusing their documentary gaze with their rich imaginations, with the result that a site's

natural beauty, made famous through a certain painting, could cause policy–makers to preserve that place, and accord it the legal status of a park or reserve. In other words, the artist's sensitive eye contributed to the public's awareness of a place's beauty, but also contributed to its conservation (for example, Thomas Moran's paintings, such as "Grand Canyon of the Yellowstone," 1872). However, in the course of time, artists' social stature, as well as their ability to influence decision–makers, has declined dramatically.

In Israel, already in the 1930s, the late artist Itzhak Danziger created "Nimrod," sculpted out of Nubian sandstone. This work, together with his sheep sculptures, became a unique expression of the local landscape, and a part of Israeli cultural heritage. In the early 1970s, Danziger initiated the rehabilitation of the Nesher Quarry (in the north of Israel, adjacent to Haifa), as an experiment in interdisciplinary work involving artists, ecologists and scientists. This unique mode of work was unprecedented at the time, and was not to be repeated for a long time afterwards. Danziger's work was defined by Moti Omer (Director of the Tel-Aviv Art Museum) as a "declaration of loyalty of a local resident to his home, an obligation to involvement and acceptance of the burden of that involvement".[1]

In modern Israel, the 1970s saw the blossoming of environmental art. This decade in Israel was characterized by artists' involvement in social activism. The novelty of this movement lay in the fact that artists began to venture out of their studios to work in open spaces, in the street, in the desert, and in abandoned quarries. The work produced had a conceptual dimension, and sometimes made a political statement. This art, for the most part, did not produce objects for museums and collectors, but expressed itself as "earth–art", as body art and as performance art, among others.

Danziger's work, together with the earth–works and the recycling works of the 1970s (Avital Geva, Dov Or Ner, Micha Ullman) laid the foundations for ecological art in Israel in the 1990s. The dream of organic nature and an egalitarian society was replaced with the dismal vision of a dying Nature.

One of the first artistic works in Israel that dealt with ecology was produced in 1970 under the name "Jerusalem River Project", by artists Joshua Neustein, Georgette Batlle and Gerard Marx. This was a two–week long attempt to depict an imaginary dried–up river, using the sound of flowing water in the Jerusalem hills. "Jerusalem River" created an illusory, symbolic dimension of a river's flow (using a loudspeaker system), thus underscoring metaphorically the need for a wet element in Jerusalem's arid landscape, just as depicted in the Bible, in ancient maps, and in Jerusalem folklore. This project was sponsored by the Israel Museum.

In 2001, 29 years later, artist Shai Zakai is rehabilitating a river–bed that was clogged–up by cement from a nearby factory and quarry, in a project entitled "Concrete Creek." In this three–year long project, the artist rehabilitates the creek bed on two simultaneous planes: the physical cleansing is paralleled by a spiritual cleansing, i.e. the physical cleansing of the river–bed from waste and cement products, and the spiritual cleansing of the polluters from their indifference to the environment. The activity in the stream receives an ecological meaning, not only at the practical level of cleaning up the gully, but also in the broader sense of "environment", which encompasses interpersonal and community ties among people, and between people and their surroundings. This project was sponsored by the Ministry of Environment, the Ministry of Science, Culture, and Sport, private funds and NGO green movements.

The Government's commitment to an interdisciplinary framework

Agenda 21 notes a "lack of awareness about the nature of the interrelated nature of all human activity and the environment" (Agenda 36.8). Similarly, it calls for "multi–disciplinary courses, in areas that have an impact on the environment." (Agenda 21 Chapter 36.D)

The Ministry of the Environment is the only government branch that is showing an understanding of the importance of interdisciplinary work in relation to environmental issues. However, other ministries lag far behind. Although the governmental report speaks of a transformation in environmental education in schools, which "are now teaching the subject from an interdisciplinary and multidisciplinary framework," this treatment of the problem is inadequate and superficial. The government's understanding of "interdisciplinary cooperation," in this context, is limited to cooperation between a biologist and a chemist, for example, but does not include cooperation between a psychologist and an historian, or an artist and a botanist.

The essence of interdisciplinary work is the complete equality of all professions and disciplines, working together from different perspectives on one assignment. Each of the participants brings with him or her a different solution, and as a consequence the whole process receives broader dimensions and gains in richness. Unfortunately, however, even the Ministry of Culture and Science does not carry out any regular activities that genuinely involve both of these departments (i.e. Culture and Science), so that in reality the two branches operate as dichotomous entities. As long as there is no policy that integrates the different specializations of these

government ministries, no interdisciplinary approach to education will emerge from policymakers.

International Ecological Art

The type of activities that are emerging on the international art scene can serve as models for a new partnership in Israel. A large group of artists, mainly in England, Germany and the United States (but in other countries as well), now devote their life and art to the exploration of, and response to, environmental problems. Museums and galleries have produced extensive exhibitions about ecology, galleries sell documentation of degradable works, which are designed to leave behind only a photographic record, and governments consult with ecological artists before reclaiming a river, a quarry or a garbage dump. Many scholarships exist for artists working on such projects, and in distinction from the situation in Israel, an artist receiving such a scholarship will hire scientists and ecologists to be part of his/her team.

Recently, a tender was put out for the rehabilitation of the largest landfill in the world, in New York City. Artists were invited to compete for the project. In Greece, the Ministry of Culture took on the rehabilitation of an abandoned quarry, whereas in Israel the Ministry of Infrastructure is responsible for this area, and artists are never invited to compete for tenders. Throughout the world, art residencies that specialize in the environment host visiting artists for varying periods of times, and contribute to the local community through their work. One of the famous visiting artist residencies is located in the center of a garbage dump in San Francisco. Ecological artists around the world are usually either environmentalists themselves, or collaborate on a regular basis with ecologists. In different countries around the world, one can find interdisciplinary courses taught by artists in the academy (e.g. England: University of Manchester, Schumacher College, USA: University of New Mexico, Goddard College, Carnegie Mellon University, and others). These programs include study of environmental ethics, environmental literature, and the relationship between humans, environment and culture, through the language of art. Scientific conferences devote sections to ecological art, and present work created through collaborations between artists and scientists (e.g. Artscience 2001, City University of New York, in New York City, 2001).

Recommendations for change

In order to promote true interdisciplinary cooperation toward raising environmental awareness, in the spirit of Agenda 21, and to facilitate artists' role as social and cultural agents, we recommend the following courses of action:

- Artists and humanists should be incorporated into decision–making processes, at the highest level. Planning committees should include environmentally concerned artists, philosophers, historians, etc. as an inseparable part of the team.
- A framework will be created for the development and promotion of art works that investigate environmental issues, and that involve inter-disciplinary teams working within communities, with the support of the Ministry of Culture and Science, and the Ministry of the Environment.
- The Ministry of Education. together with all other stakeholders, should prepare an annual program incorporating ecology with the arts and humanities. The program should be implemented by teams of inter-disciplinary coordinators, working together. Programs involving artists and communities in joint ecological-art work should be supported and promoted.
- Interdisciplinary Centers for Creative Inquiry should be established for raising awareness and instigating change by introducing a creative dialogue that is at once more visual and more spiritually oriented.
- A joint committee of the Ministry of the Environment, the Ministry of Culture, and the Ministry of Infrastructure should be established, with executive powers, to revise the law of Quarry Rehabilitation, and allow artists to take part in these projects.
- An incentive should be given to industrial plants to siphon off a certain percentage of their profits for ecological art projects focusing on the rehabilitation of the damage caused by their activities.
- Incentives should be given to scientists and planners to include artists in ecological projects.
- National and local campaigns should be encouraged to give a more central role to Ecological Art.

PART II

Sustainable Management of Vital Resources

AIR POLLUTION, GLOBAL WARMING AND OZONE DEPLETION

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Israel Union for Environmental Defense

Israel today faces air pollution problems whose impacts range from damage to public health at the local level to global warming and stratospheric ozone depletion. This chapter begins with a brief survey of the international agreements addressing these concerns. A brief overview of Israel's greenhouse gas emissions follows, after which the focus turns to the atmospheric impacts of two key sectors: electricity production and transport. Finally, Israel's contribution to ozone depletion is examined.

Throughout the chapter, critical attention is given to the Government of Israel's *Report to the Department of Economic and Social Affairs of the United Nations* (June 2001). Claims made by the report, and issues avoided by it, provide the context for analyzing current trends in Israel's environmental performance.

Israel's obligations under international agreements

Two major international conventions are of primary relevance to Israel's efforts to protect the atmosphere: the UN Framework Convention on Climate Change, addressing the problem of greenhouse gas emissions; and the Vienna Convention for the Protection of the Ozone Layer, geared toward phasing out the manufacture and use of ozone–depleting chemicals. Israel is a party to both regimes. Paradoxically, however, Israel is inconsistently

regarded as a "developing" nation under the Climate Change Convention and a "developed" nation under the Vienna Convention.

Under the **Global Convention on Climate Change (1992)**, "developed" nations are defined simply and categorically as those belonging to the Organization for Economic Cooperation and Development (OECD). According to this definition, Israel is a developing nation despite the fact that, in terms of per capita gross domestic product, Israel is clearly in league with the world's more economically prosperous societies. Nevertheless, as a "developing" nation under the Convention, Israel is not bound to achieve a specific reduction in greenhouse gas emissions. Rather, it is simply obligated to prepare a national inventory of greenhouse gas emissions and their removal by natural "sinks." While all parties to the Convention are obligated to take precautionary measures to anticipate, prevent or minimize the causes of climate change (art. 3), this duty is general and is therefore extremely difficult to enforce.

The Vienna Convention for the Protection of the Ozone Layer (1985) and the Montreal Protocol on Substances that Deplete the Ozone Layer (1987) provide a framework for controlling the manufacture and use of ozone–depleting substances. Specific targets for reducing and eventually eliminating the production and consumption of these substances have been established under this regime. A developed nation as defined by the Convention, Israel must phase out its production of ozone–depleting chemicals by 2005, with certain exceptions to be discussed below. This requirement has real significance to Israel, as the world's second–largest producer of methyl bromide, a "controlled substance" under the regime.

Beyond the two issue–specific regimes to which it is a party, Israel is a signatory to **Agenda 21,** which includes a broad array of measures aimed at protecting the atmosphere. In addition to addressing global warming and ozone depletion, Chapter 9 of Agenda 21 calls for measures to promote energy efficiency and renewable energy resources development. It also lists steps to combat transport–generated pollution, and to reduce emissions causing transboundary air pollution. Agenda 21, while declaratory in nature, provides a constructive framework for advancing necessary reforms in Israel's energy, transport and industrial sectors.

Overall trends in greenhouse gas emissions

The Government of Israel's *Report to the Department of Economic and Social Affairs of the United Nations* (June 2001)—hereafter referred to as the "Government's Report"—includes a brief declaration that a national inventory of greenhouse gas emissions and the removal of those gases has been

prepared. No specific data is provided, however, skirting the fact that Israel's greenhouse gas emissions have increased dramatically during the decade since the Climate Change Convention was adopted. Electricity production in Israel grew by an average of 7.5 percent per year from 1990 to 2000,[1] with coal, fuel oil, and diesel accounting for 100 percent of the energy resources used by this sector.[2] The number of motor vehicles operating on Israel's roads during the same period rose from just over one million vehicles in 1990 to 1.73 million in 1999.[3] By the end of 2001, the number of vehicles is expected to reach 2 million—fully double the number of vehicles operating in 1990.

These and other developments have led to a major increase in Israel's greenhouse gas emissions over the past decade. Though not included in the Government Report, other sources reveal that from 1990 to 1999, total CO_2 emissions nearly doubled—from 35 million tons to 62 million tons.[4] Per capita CO_2 emissions rose significantly during the same period—from 7.5 tons to 10 tons.[5] As of 1995, Israel was a larger per–capita CO_2 producer than Austria, France, Switzerland and Sweden.[6] Nitrogen oxide emissions, another contributor to global warming, registered even more dramatic growth—from 146,000 tons in 1990 to 310,000 tons in 1999.[7]

The increase in Israel's greenhouse gas emissions reflects, in part, the rapid growth of Israel's population over the past decade. From 1990 to 1999, the nation expanded by a staggering 34 percent, from 4.660 million to 6.125 million people.[8] Today, Israel's population continues to grow by roughly 2.3 to 2.5 percent per year—a rate unmatched by other advanced industrial nations. Yet population trends alone do not explain the growth in greenhouse gas emissions. At the same time that Israel's population expanded, its economy soared, placing it firmly in the league of "developed" nations as measured by per capita Gross Domestic Product (GDP). It is ironic, in this regard, that Israel—a "developing" nation under the Climate Change Convention—has a per capita GDP exceeding that of several states that are considered "developed" nations under the Convention simply by virtue of their OECD membership (Greece, Mexico, Poland, Portugal, and Spain, for example).[9]

By the year 2012, developed nations are bound by article 3 of the Kyoto Protocol (which Israel has signed but has yet to ratify) to cut greenhouse gas emission to 5 percent below 1990 levels. Given its sustained population growth, Israel is likely to be far from meeting this target, from which it is exempt, in any case, as a "developing nation." Nevertheless, a vigorous campaign to stabilize, if not reduce, Israel's greenhouse gas emissions is urgently needed. The fact that electricity production continues to grow at three times Israel's current rate of population growth suggests that there is ample untapped potential for curbing greenhouse gas emissions through energy conservation measures.

While the Government Report declares that Israel will undertake "voluntary activities" toward reducing its greenhouse gas emissions, no specific reduc-

tion or stabilization targets have been set. Moreover, the Government to date has exercised no practical leadership in identifying or promoting practical measures to slow the nation's ever–growing output of greenhouse gases. In the absence of a systematic plan incorporating measures to be taken by private producers and consumers as well as the Government itself, the declared commitment to "voluntary measures" stands as an empty promise.

Electricity production and use

The Government Report acknowledges that electricity demand has risen dramatically over the past decade, reaching 7.7 percent annual growth in recent years. The Report also states that while current electricity production is largely dependent on oil and coal, a 1997 Government decision calls for diversification through the large–scale introduction of natural gas. More specifically, the Report refers to a commitment by the Israel Electric Corporation to phase out old oil–powered stations and replace them with natural gas–fueled turbines by 2005.

For many years, the Electric Corporation has avoided investing in sulfur dioxide scrubbers and other essential pollution–control technology at aging oil–fired power stations in Tel Aviv, Haifa and Ashdod. To ward off public pressure and Government enforcement actions, the Corporation has repeatedly asserted that these facilities would be converted to clean–burning natural gas as soon as it became available. While the supply of gas seems closer today than in the past, the Electric Corporation's oil–burning plants continue to contribute significantly to nitrogen oxide, particulate matter and sulfur dioxide loadings in these three metropolitan areas.

Plans for a natural gas transmission network have been prepared, but the expected source of gas supplies remains in dispute. While substantial gas deposits have been discovered in Israel's Mediterranean territorial waters, no final decision has been reached regarding the exploitation of this gas to meet Israel's near–term needs. Delays in reaching a decision, which requires formal Knesset approval, derive in part from the expectation that cheaper gas supplies may be obtainable from Egypt or the Palestinian Authority. Yet in the current political climate, the likelihood of reaching a long–term supply arrangement with Israel's neighbors remains in doubt.

During the past several years, the Electric Corporation has built a number of new "gas turbines" to boost electricity during peak periods. Despite their promising name, these turbines currently rely on diesel fuel, considered an interim energy resource to be employed until natural gas becomes available. As of 2000, over 5 percent of Israel's electricity was generated by these

units,[10] operating at relatively low caloric efficiency and yielding relatively large quantities of nitrogen oxide, particulate pollution, and sulfur dioxide. With several additional turbine units nearing completion, Israel's use of diesel for power generation can be expected to rise substantially in the coming years. Even once natural gas is available, the timetable for converting diesel–fired turbines to gas is uncertain given the Corporation's declared investment priority of converting older oil–burning plants to gas.

While the Electric Corporation may eventually convert its oil–burning power plants to natural gas, it has no such plans for the massive coal–burning facilities now operating at two Mediterranean coastal sites. Coal consumption for electricity production in Israel rose from 3.79 million tons in 1990 to 10.35 million tons in 2000.[11] As of 2000, coal generated 70.6 percent of the nation's overall electricity output.[12]

Already highly dependent on coal, Israel's official policy is to press for an even higher rate of coal reliance in the years ahead. In August 2001, Israel's Infrastructure Minister gave preliminary approval to a proposed new 1100–megawatt coal–burning power station in Ashqelon, despite opposition to the plant by environmental groups as well as two government bodies—the Environment and Finance Ministries. At a time when new coal–burning power plants are generally not being built in advanced industrial nations, it is disturbing that Israel continues to expand its coal dependence. Compared to power stations using natural gas, coal–burning plants produce six times the sulfur dioxide and nearly 50 times the particulate emissions per kilowatt hour of electricity generated. In addition, they emit over twice as much carbon dioxide and five times the level of nitrogen oxides per kilowatt hour than plants operating on natural gas[13]—significantly boosting Israel's contribution to global warming.

In November 2001, the Israel Union for Environmental Defense filed a petition before Israel's Supreme Court, claiming that the Infrastructure Minister's decision favoring additional coal–based electricity production was arbitrary and unreasonable, failing to take adequate account of the environmental, health and economic factors favoring natural gas as the fuel of choice for new power generation. The petition is pending.[14]

Renewable energy resources

The Government's Report credits Israel as a pioneer in developing renewable energy technologies. According to the Report, "some 80 percent of all water heating requirements" are met through solar collectors. Beyond this current solar energy application, the Report refers to renewable energy research

experiments, ranging from solar–thermal and photovoltaic research at the Ben–Gurion Solar Energy Research Center to the heat–concentrating Solar Tower at the Weizmann Institute of Science.

Given Israel's very high level of year–round solar radiation and its advanced state of technological development, the nation has fallen far short of its potential for demonstrating the widespread practical potential for renewable energy use. The Report states that the Electric Corporation's intention is to supply 20 megawatts of electricity from "environment–friendly" power plants by 2010. In addition, brief reference is made to a 6–megawatt wind farm now in operation, a 3–megawatt Solar Tower currently used for research purposes, and a planned commercial solar power conversion system that will fuel a 250–kilowatt gas turbine.

The combined electricity from these current and planned facilities amounts to less than 30 megawatts, out of a total electricity network that, by 2010, will substantially exceed 14,000 megawatts if demand continues to grow at its current rate of 7 percent a year. Even compared to today's total installed capacity of slightly more than 9,000 megawatts,[15] 30 megawatts of renewable resource–derived electricity would contribute a mere 0.3 percent to total electricity generation.

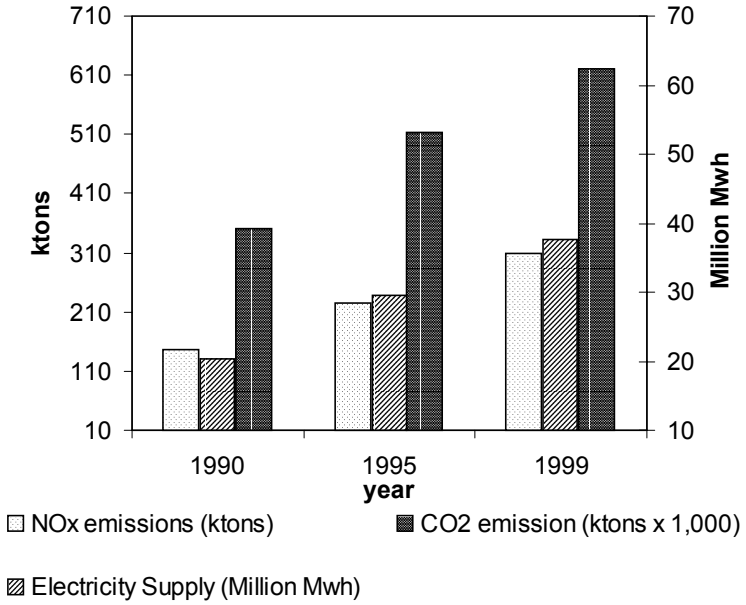
Steps are urgently needed to open up the market for renewable energy use in Israel. The Israel Electric Corporation's refusal, to date, to offer two–way metering for household–based photovoltaic arrays and other small–scale electricity generators is one of several ongoing obstacles to the introduction of alternative power–generation technologies. In addition to facilitating two–way metering, the Government should offer investment tax credits and other economic incentives to encourage investment in renewable resource–based electricity production.

Energy conservation

The Government's Report identifies energy conservation as another component of Israel's energy policy, pointing to a toll–free information hotline as well as other Government–funded sources of information on energy conservation and appliance efficiency. The Report acknowledges, however, that these steps "have not had a significant impact" and that current fuel subsidies may pose a market barrier to competition by technologies based on renewable resources.

In contrast to the Government's substantial funding of publicity campaigns promoting water conservation, particularly during the recent drought years, there has been no concerted effort by the Government or the Electric Corporation to highlight the need for energy conservation. To the contrary,

continued rapid growth in electricity demand is the driving assumption behind the Infrastructure Ministry's endorsement of expanded coal–fired electricity generation, with the Electric Corporation pressing strongly for the development of new installed capacity.



The fact that electricity consumption has been increasing at three times Israel's rate of population growth points clearly to the need for vigorous and innovative measures to conserve electricity. A genuine commitment to this challenge, by government, industry and citizen groups, is essential. Beyond public service advertising and other educational tools to promote energy conservation, the Government should review current fuel subsidies that allow for the provision of electricity to residential customers at prices well below those charged in many other developed nations. According to data published by the Electric Corporation, Israeli residential customers pay little more than one–third the rate charged in Japan, less than half the price paid in Denmark, and substantially less than residential customers pay in Germany and Spain.[16] It should be added that, from 1990 to 2000, the real price of electricity supplied to residential customers dropped by 17.1 percent.[17]

Along with the Government's misguided policies, there has been no sustained NGO–led campaign to raise public and official awareness of the

need to conserve energy. Similarly, there has been no orchestrated public pressure to provide financial and other incentives favoring renewable energy as a partial substitute for Israel's overwhelming reliance on fossil fuels. If Israel is to pursue the ultimate goal of the Climate Change Convention, rather than simply complying with its procedural reporting requirements, a shared commitment by government agencies, industry and citizen groups to promote energy conservation and renewable energy use is essential.

Energy and Israel's water crisis

A discussion of Israel's rapid rise in electricity demand would not be complete without relating this trend to the Government's ambitious plans for seawater desalination. According to Government plans, a series of desalination facilities will commence operating by 2004, supplementing existing freshwater supplies by approximately 200 million cubic meters of water annually.

The need for a far–reaching Israeli commitment to water conservation is discussed in a separate chapter of this report. For purposes of the present chapter, it is important to note that desalination, as a "supply–side" response to the nation's mounting water deficit, comes at an environmental price. Desalination is an energy–intensive technology, requiring an estimated 4 kilowatt hours of electricity per cubic meter of desalinated water.[18] Assuming that Israel meets its target of generating 200 million cubic meters of desalinated water by 2004, an additional 90 to 100 megawatts of power–generating capacity will be needed. Locally, this added electricity demand will translate into higher air pollution levels, varying according to the choice of fuel at new or expanded power plants. Globally, Israel's contribution to greenhouse gas emissions will also rise correspondingly.

The transport sector

With motor vehicle ownership approaching 2 million—nearly double the number of vehicles on the road in 1990—and with total vehicle travel having nearly doubled during the same period,[19] Israel's transport sector has a major and growing impact on local air quality as well as global greenhouse gas emissions. Vigorous efforts to improve the environmental performance of this sector are urgently needed.[20]

The Government's Report states that "[e]fforts have been made to improve fuel quality and to update emissions standards" for motor vehicles, referring to the introduction of mandatory catalytic converters on 1993 model–year cars and the intended phase–out of lead as a fuel additive by the end of 2002. Israel's lead phase–out is, indeed, under way, although there is no

approved timetable for the final withdrawal of lead from all automotive fuels. Meanwhile, leaded fuel continues to comprise some 43 percent of the petrol supplied to the transport sector, even though only 14 percent of Israeli motor vehicles actually require leaded gas or lead–replacement fuel for their effective operation.[21]

The Government's Report also points to recent progress in reducing the sulfur content of diesel fuel—a key precipitator of particulate pollution from diesel vehicles. As a result of recent improvements, the maximum sulfur content of diesel transport fuel has dropped from 0.2 percent to 0.035 percent. Moreover, the country's two major bus companies, Egged and Dan, have been ordered to use low–sulfur diesel fuel (0.005 percent sulfur) on specified urban routes. The Israel Union for Environmental Defense, a non–governmental advocacy group, is now pressing for the immediate adoption of this standard, and the subsequent adoption of 0.001 percent sulfur fuel, for all private as well as public diesel transport uses.

The importance of reducing particulate pollution from Israel's transport sector has been underscored by recent and ongoing risk assessment studies. In one study, it was estimated that small particulate matter (PM_{10}) generated by motor vehicles caused 293 premature deaths in Tel Aviv's over–30 population during 1997, representing seven percent of the 4048 deaths not caused by accidents among Tel Aviv's over–30 population.[22] In another, ongoing study of air pollution in two major metropolitan areas (Tel Aviv and Ashdod), particulate pollution has again been identified as the leading estimated cause of illness and premature death among five pollution parameters examined.[23]

Non–governmental organizations have played, and continue to play, a key role in strengthening measures to reduce particulate pollution from the transport sector. Beyond efforts to lower the sulfur content of diesel fuel, persistent non–governmental pressure led to Environment Ministry action to reduce pollution from the Egged and Dan bus companies. Over many years, the Ministry took no action addressing the companies' inadequate steps to upgrade their fleets and adopt cleaner fuels. In June 2000, the Israel Union for Environmental Defense filed a Supreme Court petition challenging the Ministry's inaction.[24] Faced with the prospect of defending itself before the Court, the Environment Minister finally issued decrees against the bus companies in June 2001, demanding specified reductions in nitrogen oxide, hydrocarbon, and particulate matter emissions. Egged, the larger of the two companies, has since filed a Supreme Court petition protesting the Minister's order.[25]

While the Government has belatedly taken steps to reduce pollution from diesel transport vehicles, it has made no changes in the highly imbalanced tax structure favoring diesel. According to a 1996 World Bank survey of transport fuel pricing in 100 nations, the only nation surpassing Israel's price bias favoring diesel was Nigeria, where a liter of diesel was sold at 23 percent of the price of petrol. Israel, at the time, sold diesel at 25.8 percent of the price of petrol. Spain—often Israel's benchmark in the European Union—priced diesel at 74.7 percent of the price of petrol, while in France and Germany, the rates were 69.5 percent and 66.6 percent, respectively. In the United States, by contrast, diesel was sold at 89.7 percent of the price of petrol.[26]

In the autumn of 2000, Israel's Finance Ministry tentatively proposed a moderate increase in the excise tax on diesel fuel to the Knesset's Finance Committee. Despite environmental movement support for this measure, intensive lobbying by the Freight Haulers Association quickly defeated it. Predictably, diesel continues to be the "fuel of choice" for small as well as large commercial vehicles, corporate passenger vehicle fleets, the Israeli military (which operates the nation's largest passenger–vehicle fleet), and a growing number of private car owners.

Inadequate roadside enforcement of motor vehicle pollution control standards is a further obstacle to protecting Israel's air quality. Authority for roadside vehicle inspections is loosely shared by the Environment and Transport ministries, yet neither ministry fields the equipment or personnel needed to project a strong enforcement presence. This problem is among the issues now being examined by a joint NGO–Government working group on mobile source enforcement, coordinated by the Arava Institute for Environmental Studies. To fill the national enforcement gap, the Haifa Area Association of Towns has adopted a by–law authorizing local officials to conduct roadside motor vehicle emissions checks, including the power to fine vehicle owners for non–compliance with emissions standards. The Tel Aviv City Council has given preliminary approval to a municipal by–law achieving the same purposes.[27]

While making some progress in reducing emissions from conventional–fuel vehicles, the Government has done little to promote the use of alternative–fuel vehicles. In one initially promising move, the Government issued a decision setting a December 2000 deadline for relevant ministries to take prescribed steps enabling the import and use of liquefied petroleum gas (LPG) vehicles. The deadline has long passed as of the time of this writing, and the necessary measures have yet to be taken.[28]

Production and use of ozone–depleting chemicals

The Government's Report states categorically that Israel is in compliance with all provisions of the Montreal Protocol on Substances that Deplete the Ozone Layer and its amendments. It further declares that the Government is implementing a strategy "to phase out import, consumption and production of ozone–depleting substances in accordance with the timetables set in the protocol and amendments."

Although a small nation, Israel is one of the world's two primary producers of methyl bromide, a "controlled substance" under the Montreal Protocol. Accounting for roughly one–third of global output, Israel ranks second only to the United States in its production of the compound. According to the U.S. Environmental Protection Agency, human–made methyl bromide is responsible for about 4 percent of ozone depletion over the past 20 years, with use of the compound for agricultural fumigation accounting for about 2.5 percent of overall ozone depletion.[29]

The Government's Report states very generally that "production of methyl bromide has been restricted and control is ensured by means of special conditions incorporated into the business license of the Israeli manufacturer." The Report, however, provides no detail regarding the current level of methyl bromide manufacture by Dead Sea Bromine, the Israeli company that produces the substance. According to the Protocol's phase–out targets, Dead Sea Bromine's production in 2001 and 2002 must be no more than 50 percent of its 1991 output level. By 2005, the company must achieve "zero" production—with certain exceptions.[30] For example, production for "critical uses" may continue beyond the phase–out deadline, yet the Parties to the Montreal Protocol have not defined what these uses may be. A further exception applies to production that meets the "basic domestic needs" of developing nations.[31] Finally, production of methyl bromide for quarantine and pre–shipment applications is entirely excluded from the Protocol's restrictions.[32]

Effective oversight of compliance with methyl bromide phase–out targets is greatly complicated by these various exceptions to the phase–out deadlines. In Israel's case, accountability is further compromised by the involvement of Dead Sea Bromine in methyl bromide manufacture outside Israel's borders. In response to a recent inquiry, Dead Sea Bromine has generally acknowledged that it has a business partnership with a Chinese corporation that manufactures methyl bromide. However, the extent of its investment in this corporation and the quantities of methyl bromide produced and marketed through this arrangement have not been divulged to date.[33]

Israel's cooperation with China is particularly disturbing in light of China's failure to ratify the 1992 "Copenhagen Amendment" to the Montreal Protocol, the critical provision designating methyl bromide as a controlled ozone–depleting substance under the Protocol. As China has not subscribed to the Copenhagen Amendment, it remains exempt from any obligation to reduce its production and use of methyl bromide, apparently giving Dead Sea Bromine a major avenue to continued manufacture of the substance beyond the limits applicable to Israel under the terms of the Protocol.

Of further concern is the fact that Israel has failed to ratify the 1997 "Montreal Amendment" to the Montreal Protocol, barring Parties from engaging in the trade of methyl bromide with non–Parties.[34] Looking only at economic factors, it is easy to understand the Government's decision not to ratify the trade ban. So long as the other leading producers of methyl bromide—the U.S. and China—refuse to sign onto the trade ban, Israel's ratification of the Montreal Amendment exposes Dead Sea Bromine to the predictable loss of valued customers to its competitors. Yet, from an environmental perspective, the refusal of Israel and other producer–nations to subscribe to the trade ban severely erodes the integrity and effectiveness of the phase–out regime. It is therefore vital that the Government of Israel—ideally, though not necessarily, together with the United States and China—ratify the Montreal Amendment.

Greater transparency in the Government of Israel's oversight of the Protocol is also essential. The inter–ministerial committee charged with overseeing implementation of the Montreal Protocol, chaired by the Environment Ministry, includes no NGO representatives and to date has invited no public participation. This utter lack of transparency leaves the public with no reliable means of evaluating the degree to which Israel is taking necessary and appropriate measures to achieve the declared purposes of the ozone protection regime.

Conclusions

A number of urgent steps should be taken by the Government of Israel to comply more fully with the overriding purposes of the Climate Change Convention and the ozone protection regime established by the Vienna Convention and the Montreal Protocol. Beyond these measures, the Government should genuinely undertake to advance the broader goals of Agenda 21 pertaining to atmospheric pollution and air quality protection. Priority should be given to the following:

- **Actions to reduce health–endangering air pollution from the transport sector.** Measures that should be taken in this sector include:

adoption of low-sulfur fuel (0.005% sulfur, and eventually 0.001% sulfur) for all diesel transport uses; tax reforms substantially narrowing the price differential between diesel and petrol; a complete phase–out of leaded fuel by the end of 2002; vigorous enforcement of motor vehicle emissions standards at the national and local levels; full implementation of the pollution control reforms applicable to the nation's two major bus companies under the recently–issued official decrees; and expedited entry of LPG and other clean–fuel vehicles for commercial and private use.

- **Steps to curb greenhouse gas emissions.** In addition to ratifying the Kyoto Protocol, Israel should move beyond the mere inventorying of greenhouse gas emissions and sinks to a genuine, systematic campaign geared toward curbing the nation's rapidly increasing greenhouse gas emissions. Specifically, a high–profile energy conservation campaign should be matched with real investment in energy–saving technology, as means of slowing the nation's ongoing rampant growth in electricity consumption. Market signals should be reformed toward the same end, raising electricity prices to close the gap between Israel and other developed nations, while at the same time providing real and substantial subsidies to the development of non–polluting renewable resource–based energy applications. In the transport sector, strong measures should also be taken to strengthen public transit and non–motorized modes of mobility.

- **Measures to protect the ozone layer.** As a first step toward ensuring its good–faith commitment to ozone layer protection, the Government of Israel should immediately ratify the 1997 Amendment to the Montreal Protocol, barring trade in methyl bromide with non–Parties. To build public confidence in the steps being taken to phase out production and use of ozone–depleting compounds (most notably methyl bromide), public representatives should be invited to participate in, or at least observe, the meetings of the inter–ministerial committee established to oversee compliance with the Montreal Protocol. Finally, Dead Sea Bromine's investment in methyl bromide manufacture in China—for all practical purposes a non–Party to the Protocol as applied to methyl bromide—should be subject to rigorous public scrutiny.

Notes

1. Israel Electric Corporation, *Statistical Report – 2000*, Table 83 (in Hebrew).

2. *Ibid*., Table 78.

3. Central Bureau of Statistics, *Statistical Abstract of Israel – 2000*. Table 18.15.

4. *Ibid*., Table 1.7.

5. Per capita emissions are calculated by dividing overall $C0_2$ emissions by population: 4.660 million in 1990 and 6.125 million in 1999.

6. Israel Ministry of the Environment, *Environmental Indicators in Israel* (2001).

7. *Statistical Abstract of Israel*, Table 1.7.

8. Israel Central Bureau of Statistics, http://www.cbs.gov.il.

9. *Statistical Abstract of Israel – 2000*. Table 6.19.

10. Israel Electric Corporation, *Statistical Report – 2000*, Table 6.

11. *Ibid*., Table 10.

12. *Ibid*., Table 6.

13. Dr. Ayala Tamari, "Gas for Electricity Production: The Natural Choice," *Yarok Cahol Lavan*, Aug.–Sept. 2000 (in Hebrew). Dr. Tamari served as Head of the Environmental Department of the Israel Infrastructure Ministry (previously the Energy Ministry) from 1987 to 1999.

14. *Israel Union for Environmental Defense v. Minister of National Infrastructure*, No. 9032/01.

15. Israel Electric Corporation, *Statistical Report – 2000*, Table 75.

16. As of 1 January 2000, the price charged to Israeli residential customers was $0.091 per kilowatt hour (KWH), whereas in Japan, the comparable charge was $0.25 per KWH; in Denmark, $0.19 per KWH; in Germany, $0.134 per KWH; and in Spain, $0.117. Source: Israel Electric Corporation, *Statistical Report – 2000*, Table 86.

17. Israel Electric Corporation table, reprinted in *Haaretz*, 3 July 2001.

18. P. Glickstern, "Desalination: The Present Situation and Future Possibilities," in Barry Rubin, ed., *Efficient Use of Limited Water Resources* (Begin–Sadat Center, Bar Ilan University, Dec. 2001), p. 16 (in Hebrew).

19. Total land transport rose from 18.7 billion kilometers in 1990 to 35 billion km. in 1999, with the primary growth occurring in private vehicle travel (12.2 billion km. to 21.7 billion km.). *Statistical Abstract of Israel – 2000*, Table 18.17.

20. While major shifts in transport infrastructure investments are essential (e.g. introducing urban and inter–urban rail as well as encouraging non–motorized mobility), recommendations on this subject are presented in a separate chapter of this report.

21. Energy Engineering Center, Faculty of Mechanical Engineering, Technion – Israel Institute of Technology, *Strategy for Removing Lead from Petrol in the State of Israel*, Interim Report #2, Research #034–177 (August 2000), p. 7.

22. Ginsberg et al., "Mortality from vehicular particulate emissions in Tel Aviv–Jafo," in *World Transport Policy and Practice* 4/2 [1998], 27–31.

23. This study is a joint undertaking of the U.S. Environmental Protection Agency, Israel's Environment Ministry, and the Israel Union for Environmental Defense. Its results are expected to

be released early in 2002. The pollution parameters examined by this study are particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide, sulfur dioxide, and ozone.

24. *Israel Union for Environmental Defense v. Ministers of Environment, Infrastructure, and Transport, and the Egged and Dan Bus Cooperatives*, No. 3974/00.

25. *Egged Bus Cooperative v. Ministers of Environment, Infrastructure, Transport, and Industry, and the Israel Union for Environmental Defense*, No. 5208/01.

26. Faiz et al*., Air Pollution from Motor Vehicles: Standards and Technologies for Controlling Emissions* (World Bank, 1996). Percentages are derived from diesel and petrol price comparisons appearing in Table A3.3.2.

27. The Tel Aviv by–law, adopted in principle by the City Council in August 2001, is the outcome of a joint campaign of the Council's two–member Green Party faction and the Israel Union for Environmental Defense.

28. In January 2001, the Israel Union for Environmental Defense filed a Supreme Court petition – still pending – calling on the relevant government agencies to meet their obligations facilitating LPG use by the transport sector. *Israel Union for Environmental Defense v. Ministries of Infrastructure, Transport and Environment*, No. 327/01.

29. U.S. Environmental Protection Agency, Methyl Bromide Phase Out Web Site, http://www.epa.gov/ozone/mbr/mbrqa.html.

30. These deadlines, set forth in Adjustments to Article 2H of the Montreal Protocol as agreed at the Ninth Meeting of the Parties in September 1997, are automatically binding on all Parties.

31. Montreal Protocol, Art. 2H(4) & (5). The phase–out schedule applicable to methyl bromide production directed at meeting "basic domestic needs" in developing nations extends through 1 January 2015. See *Handbook for the International Treaties for the Protection of the Ozone Layer* (Ozone Secretariat, UNEP, Fifth Edition, 2000), pp. 320–21.

32. Montreal Protocol, Art. 2H(6). As an admittedly crude gauge of the magnitude of methyl bromide use for quarantine and pre–shipment applications globally, it is worth noting that these uses constitute roughly 10 percent of total U.S. consumption of the compound, according to the USEPA. http://www.epa.gov/ozone/mbr/mbrqa.html.

33. Letter from Efrati, Galili & Co., 6 December 2001, attorneys representing Dead Sea Bromine, in response to a formal query submitted by the Israel Union for Environmental Defense, 14 November 2001.

34. Israel approved the Montreal Amendment in Government Decision No. 2268, 17 August 2000. However, in a letter to the Government Secretary dated 17 June 2001, Israel's Foreign Minister Shimon Peres announced that the inter–ministerial committee charged with overseeing the Montreal Protocol's implementation had reversed its earlier endorsement of the trade ban, now recommending a freeze on all steps toward ratification of the Amendment.

CONSERVATION OF BIOLOGICAL DIVERSITY

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Located at a biogeographic crossroads and enjoying extremely diverse topography and climatic zones, Israel's biodiversity is extremely rich. However, a high rate of population growth and development imperil Israeli biodiversity. This chapter begins with a review of institutional lacunae related to recording, studying, and monitoring biodiversity. It is followed by a brief discussion of the state of biodiversity education in Israel. The chapter proceeds with a review of specific major conservation problems in Israel. In conclusion, actions are listed that the Israeli government must take in order to conserve its biodiversity.

Introduction

Israel is located at a biogeographical crossroads, a meeting point for fauna and flora that originate from three different continents: Europe, Asia and Africa. The fauna and flora of Israel are therefore extremely diverse, and this diversity is further enhanced by the many climatological zones found in this small country. Israel is situated between the Mediterranean and the Red Seas, and on the most important bird migration route in the eastern hemisphere, which increases the country's biodiversity even more.

Over the past century, Israel's environment has been severely affected by a tremendous surge of urbanization and development aimed at absorbing a tenfold increase in the population (at least a 16–fold increase between the Mediterranean Sea and the Jordan River) and developing a successful

agriculture. Unfortunately, these processes have led to sharp habitat decrease, severe habitat fragmentation, rechanneling and contamination of Israel's meager water supply, coastal water and land, and widespread use of dangerous pesticides. All these factors have affected and continued to affect Israel's environment and its biodiversity.

Conserving biodiversity requires a sound scientific basis for actions taken, the ability to take action, and public support which is the outcome of education resulting in public understanding. Biodiversity research is crucial for forming viable plans and future projections for nature conservation and management. Education is important for developing public understanding and awareness.

The present report focuses on three types of issues: a) institutional lacunae related to recording, studying, and monitoring biodiversity in Israel, b) biodiversity education in Israel, and c) specific conservation issues.

Institutional lacunae related to recording, studying, and monitoring biodiversity

Agenda 21 refers to the need for surveying, monitoring, recording, and studying biodiversity, as follows:

> **A (l) Promote, where appropriate, the establishment and strengthening of national inventory, regulation or management and control systems related to biological resources, at the appropriate level;**
>
> **C (c) ...Special attention should be given to the development and strengthening of national capabilities by means of human resource development and institution–building, including the transfer of technology and/or development of research and management facilities, such as herbaria, museums, gene banks, and laboratories, related to the conservation of biodiversity.**
>
> **C (h) Promote national efforts with respect to surveys, data collection, sampling and evaluation, and the maintenance of gene banks.**
>
> **B ...the need to develop:(a) efficient methodologies for baseline surveys and inventories, as well as for the systematic sampling and evaluation of biological resources.**

Israel has a national Gene Bank for Agricultural Crops, at the Volcani Center, which supports both *ex situ* and *in situ* conservation of plant species indigenous to Israel that are related to domesticated plants. However, it has no institution whose mission is to record and study its biodiversity. In most

countries, national museums of natural history and national herbaria assume this role. Israel has no national museum of natural history or national herbarium, and the only existing collections are housed and curated by scientists at the Hebrew University of Jerusalem and at Tel Aviv University. The existence of taxonomic expertise in the country therefore relies on the goodwill and dedication of particular scientists and on the development programs in Israeli institutions of higher learning. With the vagaries of academic development and the emphasis in the past several decades on molecular level biology at the expense of organismal level research, taxonomic expertise is decreasing in the country, and it is sorely missing for key taxa. At this point, for want of experts, it is virtually impossible to develop this expertise within the country.

At the Hebrew University of Jerusalem, retired curators have not been replaced by new scientists in this field, and taxonomic expertise has declined dramatically. At Tel Aviv University, where an active group of scientists is still employed, the collections, the chief record of the biodiversity of our region in the past century, are housed in appalling conditions, severely limiting their development and even endangering their very existence.

This problem is particularly severe if one considers the high natural species diversity of the country, the extreme rate of human development, the relatively short tradition of natural history research in Israel, and the paucity of biodiversity research in the entire region.

Making the biodiversity data available in Israel through BioGIS, a national database of flora and fauna established by the Hebrew University, (see Ministry of the Environment [MOE] report) is at present possible only for some plant data, and even that is part of a scientific initiative that has so far not received any public funding.

Israel has no formal biological survey, as do many other countries. Some surveys are conducted by the Society for the Protection of Nature in Israel (SPNI, an NGO) and by the Israel Nature and National Parks Protection Authority (NNPPA) but these are almost entirely limited to some of the larger vertebrates and to vascular or even woody plants. Other taxa are not monitored regularly. Whatever monitoring does take place is carried out by particular scientists in the Israeli academy, usually with a view to their own research rather than a national view. The decline or disappearance of some species (freshwater fishes, for example) was discovered in recent years by a local expert due to his dedication alone. Due to the lack of biodiversity records in Israel, it is almost impossible to estimate and verify loss of biodiversity or other processes and changes (i.e. invasion of species).

Moreover, it is extremely difficult to raise funds for biological surveys in Israel. Scientific funding agencies have no sections dedicated to this issue, so even interested scientists are limited in their abilities. For example, research funds in the Ministry of the Environment do not include biodiversity surveys as research topics, while the NNPPA does not have the appropriate funding opportunities for this type of activity.

As a result, environmental impact assessment reports, even when they have an ecological aspect are usually limited to a small number of taxa (woody plants, birds, mammals) and do not reflect any other biodiversity components. Plants are often considered fairly insensitive to disturbance, so using them as indicators may be misleading in allowing development.

Biodiversity education

Agenda 21 refers to the need for awareness and education:

> **C There is a need where appropriate to: (c) promote and encourage understanding of the importance of the measures required for conservation of biological diversity and the sustainable use of biological resources at all policy–making and decision–making levels in governments, business enterprises and lending institutions, and promote and encourage the inclusion of these topics in educational programs.**

The change of emphasis in biological research has influenced the trends in Science Education in schools and in informal frameworks. The educational systems, at a time lag of 20 years, changed their focus from field biology to biochemistry as expressed in physiological systems. In the Israeli social and cultural arena, these universal trends coincide with a transformation from agrarian romanticism to hedonistic urbanism. Thus, the idealistic Zionism of the early decades of last century orchestrated a dissonance between glorifying modern development and construction on the one hand—poetically invoked as “clothing the land in concrete”—and a romantic bonding with the land of the Bible its fauna and its flora on the other. However, in the last three decades a rift is growing between the public and the natural landscape.

Today, the biological curricula is dominated by the science education approach of ‘Science and Technology in the Society (STS). A new curriculum was recently introduced to elementary and middle schools, as well as to non–science high school students, in which there is only minor status given to biodiversity issues. The curriculum of the high–school biology stream has a chapter on ecology, but no serious discussion of human–biosphere inter-

actions. However, this curriculum is now under preliminary revision and it has been suggested that 'Biodiversity' be introduced as a topic with greater weight. Thus, one can conclude that there is no serious attempt within the formal school system to educate future citizens to an understanding of, and responsibility toward, environmental biodiversity.

There are some initiatives outside of the formal school system, led mainly by NGOs, which attempt to develop biodiversity education programs. Many of these suffer from the fact that much of the NGO teaching work is carried out by people without formal training or education. A new initiative of Tel Aviv University recently established a biodiversity center named 'Nature Campus'. The audience for these activities is as yet very limited, and many of Israel's children and adults never receive any exposure to biodiversity issues.

Specific biodiversity conservation issues

- The most severe threat to biodiversity worldwide is habitat loss and fragmentation. Therefore, careful and educated planning is key to biodiversity conservation, in particular in a small country like Israel, where entrepreneurs are aggressively pushing for many building projects. In February 2002, the Israeli government succeeded in approving a major change in planning procedures, by piggybacking the legislation onto the yearly national budget. This change implies that projects deemed as 'national' can be planned and executed without the approval of the regular professional planning channels of the country. A further worrisome fact in this respect is that the new national–level plan for Israel's development, that does have the value of open spaces and habitat corridors in mind, is now being blocked as a result of political pressure.

- Israel has very few railways, so most of the transportation is based on roads, whose development has been accelerated in the past decade. Most, if not all, of these roads are constructed without a view to their effect on habitat fragmentation. In many of the wider roads, the cross traffic is separated by concrete blocks that run for miles, practically fragmenting all populations of non–volant species.

- Although the MOE report states that 25% of the country is designated as nature reserves, most of these reserves are not yet approved, and they are not equally distributed. Most of this land is in the arid Negev desert, where development pressure is low. It should be noted, however, that a large fraction of this designated area serves the dual purpose of nature reserve and military training zone, with tanks, artillery and infantry sharing the land with biodiversity, to the latter's detriment. Under 3% of

the Mediterranean zone of Israel is designated as nature reserves (contrary to the 10% of the IUCN recommendations [International Union for Conservation of Nature and Natural Resources]) and this implies the dire need for careful and responsible land management.

- Many areas designated in the different plans as nature reserves and national parks have not been formally declared as such for years. This implies that the level of protections that they are currently under is much lower than what they would be entitled to once approved. It is hard to understand why this process must be so lengthy.

- Agenda 21 states the following:

  A (j) Promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas.

  Israel's small size, coupled with its intensive agriculture and development, imply that in many protected areas this recommendation is not heeded. For example, Ein Afeq, one of Israel's two Ramsar designed major wetlands (see MOE report), is a small nature reserve surrounded by agricultural fields where intensive agriculture is being practiced. The fields, including the fertilizers and pesticides therein, drain into the nature reserve. The concept of biosphere reserves incorporates these curbed development approaches, but Israel has a single biosphere reserve, whose functioning is questionable, and plans for a second biosphere reserve have recently been halted.

- Although alien invasive species are considered the second most serious threat to biodiversity worldwide, no systematic research of alien invasive species has been conducted to date in the country, and awareness of this issue among the public and among policy–makers is very low. Invasive species in the country include plants imported in order to stabilize sand dunes, nutrias, exotic aquaria fish and other exotic marine species, etc. In the Sea of Galilee we are now aware of a number of invasive species that have established large populations in the lake. Furthermore, there are species that regularly escape fish farms, as well as the regular restocking of the lake with native and exotic fish. These species affect the lake by preying upon native species, turning over the sediment, etc. It is noteworthy that the controversial aquaculture initiative in the Gulf of Eilat—already considered by many marine biologists as a threat to the ecosystem and the coral reef due to its enriching of the Red Sea waters—also implies the introduction of an alien fish species to the Red Sea, and the introduction of some alien fish diseases as well. Still, no practical actions have been taken so far. A much better understanding of these

problems and suitable legislation are required. The controversy over the status of the aquaculture in the Gulf of Eilat is ongoing.

- Israel is currently undergoing a freshwater crisis. The dearth of freshwater and over–pumping produce lower water tables, and the result is the drying up of Israel's wetlands. Moreover, Israel's rivers are drying up, since their waters are generally curbed upstream. This, coupled with severe contamination from chemical plants and other industries, has severely harmed many of Israel's freshwater species. Moreover, treated sewage in Israel, which may become the major type of water available for Israeli rivers, is not reclaimed to a high standard, and this may be a limiting factor for some of Israel's aquatic species. The Hula Nature Reserve, Israel's flagship wetland designed as a Ramsar site (see MOE report), suffers severely from this problem. Much of the water in this reserve is recycled from fish ponds, and the implications of this situation are clear. The major problem is that there is no strict allocation of freshwater for nature in Israel, and this issue requires legislation.

- Poaching has become an issue in Israel in recent years, due to the large number of agricultural workers from Thailand (currently *ca.* 25,000 workers). In a small country with only 4000 registered local hunters, many of whom are not active, this number of Thai poachers is having a severe impact in some areas. Although poaching activities have been documented time and again, it is difficult to deal with; there is a long delay between pressing charges and legal action, and a large number of vertebrate and marine invertebrate species are apparently suffering severe losses. Here the problems are compounded—with enforcement, legislation, cultural awareness, and politics all playing a part.

- Pesticides are used intensively in many parts of the country, resulting in both potential health hazards and in a real risk to wildlife. The topics of pesticide registration with regard to wildlife risk assessments, control of pesticide usage, and monitoring effects on wildlife, are far below the standards practiced in most developed countries. This problem has affected particular populations of raptors in the country, but other species have also been harmed. It is important to remember that migratory birds are affected by the use of pesticides as well, so the effect of these substances reaches beyond the borders of the country.

- One of the major problems plaguing biodiversity conservation in Israel is low allocation of funds and human resources for enforcement. Many harmful activities such as driving all–terrain vehicles and illegal sand mining are rampant and the current workforce is unable to control them. With political friction and the rise in violence in the region, enforcement becomes even more difficult. The budget of the NNPPA, which is in

charge of enforcement, is based to a great degree on the public's visits to NNPPA reserves and parks. Over the past year, these visits have dropped precipitously due to the situation in our region and the NNPPA cannot carry out its duties without heavy government aid. This unhealthy situation invites political involvement to the detriment of nature conservation. A recent move by the Israeli government, to remove a force of 31 rangers of the Green Patrol from under the supervision of the NNPPA, and to transfer them to the Ministry of Infrastructure is bound to make the situation even worse. By comparison, the NNPPA has a staff of only some 45 rangers, so removing 31 is a severe blow to enforcement.

Conclusions

- Although, generally speaking, there is a growing awareness in Israel of the need to conserve biodiversity, the formal institutions for studying, recording, and monitoring biodiversity are lacking. It is imperative that a national museum of natural history be established, in order to study and to record the biodiversity of the country. Moreover, a biological survey is necessary in order to monitor changes in biodiversity. The two can be united institutionally, and careful planning may enable both to function within, or in collaboration with, Israeli universities, in order to save funds and to make use of the current facilities. However, national funding for these activities is crucial, and national guidance is required in order to ensure the continued monitoring of the country's biodiversity.

- Any public agenda, such as nature conservation, depends on public demand and consent. Conservation has a price–tag to it, and involves many opposing interest parties. Without public support of the toll paid for conservation, a campaign cannot be pursued. This support is the outcome of educating the public, decision–makers and the layperson voter or her/his children, to the crucial importance of conserving bio-diversity, for the benefit of all. To this end, biodiversity education should be promoted at all levels.

- A specific allocation of water for nature conservation is required. Reclaimed water that goes into rivers must meet much higher standards than the current ones.

- More strict control, enforcement, and legislation regarding the use of pesticides are required.

- Funds for enforcement, and more strict enforcement measures, are crucial, if biodiversity in Israel is to be preserved. Low funding means poorer enforcement and greater dependence on the whims of political forces.

- Sustainable development practices and the preservation of biodiversity should be major considerations in the planning process in such a small and overpopulated country as Israel. Laws for bypassing national planning procedures are to be condemned.

- The declaration of designated nature reserves and national parks should be expedited.

REGIONAL & INTERNATIONAL COOPERATION

Gidon Bromberg and Robin Twite

Abstract

Effective international and regional cooperation are key components of Agenda 21 and prerequisites for sustainable development, due to the rapid development of the global economy and the transboundary nature of ecosystems.

After detailing the regional and international setting and issues at stake, this chapter reviews Israel's Agenda 21 and other environmental treaty obligations over this last decade. The authors recognize that the political instability and violence taking place in the region have made cooperation difficult. This chapter concludes, however, that despite the situation, a lack of leadership and political will on regional environmental issues has been shown at different times by all governments and authorities in the region. Though some progress has been recorded, the political echelon have too often held environmental issues, and in particular pollution prevention, hostage to advances in the Peace Process, or either side has too often used them for political point scoring.

The cost of this failure to cooperate on regional environmental issues has directly contributed to the dramatic degradation of key natural ecosystems in Israel and the region. For example, pollution of the Coastal and Mountain Aquifers (key sources of drinking water for both Israelis and Palestinians) and the degradation of sites of global heritage such as the River Jordan and the Dead Sea, could have been avoided or mitigated if the political will and commitment had existed to cooperate regionally for the benefit of the environment.

Environmental justice issues pertaining to the exploitation of scarce transboundary natural resources are also discussed in this chapter. Furthermore, this chapter briefly reviews Israel's international environmental obligations, calls for specific treaties to be ratified prior to the Johannesburg Summit and concludes that specific government policy

concerning economic globalization and trade policies have insufficiently taken into account sustainability considerations. Finally, a set of specific recommendations for action concludes this chapter.

Importance of the issue

The Regional Setting

In the Middle East, in particular, regional cooperation on environmental issues is essential, due to the small size of many of the countries in the region and the fact that two or more peoples share key ecosystems on which much of the development takes place. Key topographic features and related ecosystems are shared with neighboring peoples. Israelis and Palestinians share the Coastal and Mountain Aquifers, Israel's largest ground water source. Israelis, Syrians and Lebanese share the upper reaches of the River Jordan. Israelis, Palestinians and Jordanians share the lower Jordan and the Dead Sea Basin, a unique crossroads of cultural and biological diversity. Israelis, Jordanians, Egyptians and Saudis share the Gulf of Aqaba, the most northern coral reef in the world. Finally, the Eastern Mediterranean, along whose shores more than 70% of the Israeli population lives, is shared with Palestinians, Egyptians, Lebanese, Syrians, Turks and Cypriots. The transboundary nature of these ecosystems and the small size of the countries in the region mean that transboundary pollution issues, be they sewage flow, air pollution or solid waste disposal, require cooperative efforts to protect the shared ecosystems. Scarcity of resources (in particular water and land), require that parties cooperate to avoid over–exploitation, prevent problems of externalities and spillover effects and for the purpose of guaranteeing equity in resource allocation.

In order of importance, the relevant resources affect:

Water Issues:

Over the last decade, water resources have been a contentious issue on the negotiating table of the Peace Process. Israelis and Palestinians claim water rights to the Coastal and Mountain Aquifers, while Israelis, Palestinians and Jordanians all have riparian claims to the Jordan River.[1] For Israelis and Palestinians, these water resources make up close to 100% of their water supply. The Oslo Peace Process and the Peace Treaty between Israel and Jordan did seem to bring some concrete advances on water issues between the respective parties during this last decade.[2] Israel recognized Palestinian water rights[3] and both Jordan and the Palestinians saw an increase in water transferred as a direct result of negotiations.

There remain, however, some 180 Palestinian villages[4] that are unconnected to water mains and have to rely on water tanks or rainwater harvesting in order to meet their most basic water needs. There is also a disparity in water consumption rates between Israelis and Palestinians,[5] due in part to Israeli control of the water resources of the Mountain Aquifer under the claim that Israel developed and fully utilized the water resource first by pumping from springs in Israel proper before 1967. Palestinians claim that water allocation rates must be corrected for their benefit because the recharge area of the Mountain Aquifer is largely over the West Bank. The fact remains that average rates of 50 to 80 liters per day per person are insufficient to meet basic Palestinian domestic needs and, according to Agenda 21 principles, they should be increased to 100 liters or possibly 150 liters considering the hot climatic conditions.[6] Many writers have suggested arrangements whereby water increases to the Palestinians would be compensated by treated sewage to be returned for Israeli agriculture. Despite the violence—and at times virtual collapse of the Peace Process—it is significant to note that, on water supply issues, meetings of the Joint Israeli/Palestinian Water Commission and other water negotiations have never come to a standstill and are informally taking place to this day.[7]

In contrast to water supply issues, very little progress has been evident on the prevention of pollution of shared water resources. Untreated sewage continues to flow out of almost all Palestinian towns and cities,[8] and many Israeli settlements—and in particular industrial zones—do not adequately treat their sewage to the levels required by Israeli law.[9] The same is true for the over 250 waste disposal sites dotted all over the West Bank, leaching into the groundwater. Not a single sanitary waste disposal site exists in the West Bank either for the Palestinian communities or for Israeli settler communities.[10]

Political point–scoring has prevented progress. Some Israeli governments had linked their approval of sewage facilities or sanitary waste disposal sites in the West Bank with the connection of those facilities to surrounding Israeli settlements. The Palestinian side would then refuse to proceed on the grounds that any such linkage would be seen as *de facto* recognition of settlements. At other times, Palestinian officials had decided simply to refuse cooperation on environment—linking any cooperation to political progress in negotiations. International assistance offered to build sewage treatment plants had therefore been lost, with the result that millions of cubic meters of raw sewage have continued to flow and pollute the groundwater.[11] In times of closure, collected municipal garbage has been dumped outside Palestinian towns for the sake of not driving on Israeli–made bypass roads, or at other times in order to avoid paying a tipping fee to the Israeli

authorities that manage the dumpsite.[12] The NIMBY syndrome is also prevalent, as the close proximity of Israeli and Palestinian communities makes the siting of any locally undesired land use (such as wastewater treatment plants or solid waste landfills) a contentious issue for the community affected by it. Outright refusal to work together on pollution prevention issues until the political situation improves was also too often witnessed. The Israeli–Palestinian Committee on the Environment, established under the Oslo Accords, has less than effectively functioned and has not even informally convened for over two years.

The Oslo Interim Agreement that divided the West Bank into Areas A, B and C was never designed to be permanent. The fact that these arrangements continue to exist makes effective environmental management impossible, due to the lack of territorial integrity that they create. An interesting NGO initiative to overcome the political hurdles of environmental protection for the West Bank, advanced the idea that wastewater treatment and related issues, for both the Palestinian populations and Israeli settlements, be dealt with through international private consortia.[13] In the meantime, pollution from sewage and solid waste continues to contaminate the most important source of drinking water that Israelis and Palestinians possess. One expert forecasts that if current practices continue, in just 20-30 years the waters of the Mountain Aquifer, the best quality drinking source in the region, will be so polluted that they will no longer be fit for domestic consumption.[14]

The Dead Sea Basin:

The Dead Sea Basin, shared by Israelis, Palestinians and Jordanians, is the lowest place on earth, where the saltiest large water body on the globe is found (ten times saltier than the Mediterranean Sea). The Dead Sea is rich in mineral compounds that make it both famous as a natural spa, as well as attractive to industry. It is located in the Great Rift Valley at the crossroads, not only of human civilization, but also of biodiversity—linking European, Asian and African species. Despite its unique features, development around the Dead Sea has been based on unsustainable competition for its resources by both Israel and Jordan, and by the different interests that exploit those resources—agriculture, the mineral extraction industry and tourism. The failure on the part of the Israeli and Jordanian governments to recognize the ecological limits of water substraction has resulted in unregulated competition. This has devastated the Dead Sea, with a third of its surface level drying up and the sudden creation of land craters: these sinkholes have appeared where land is collapsing due to human interference with the natural water balance.[15] NGOs have led a major campaign to save the Dead Sea and promote sustainable development for the basin through developing the concept of World Heritage and Biosphere registration for the area.[16] Though some government ministries are now supportive and while some

progress is in the works, political will is still lacking to actually implement changes on the ground and reverse an ongoing ecological tragedy.

Gulf of Aqaba:

Israelis, Jordanians, Egyptians and Saudis share the Gulf of Aqaba, which was formed from the same fault line that created the Dead Sea. The Gulf of Aqaba is the northernmost coral reef in the world, an underwater paradise with nearly 1000 species of tropical fish and 230 varieties of coral, surrounded by high desert mountains on either side.[17] Over–development—particularly at the head of the gulf, by the cities of Aqaba and Eilat (tourism and industry)—has here too placed the future of this unique ecosystem at risk.[18] On the Israeli side, NGO action managed to stop raw sewage from Eilat flowing into the gulf.[19] The Israeli decision earlier this decade to allow fish farms to be built off the coast of Eilat, resulting in similar amount of nutrients to be emitted as the prior sewage outflow, remains highly controversial.[20] Transboundary NGO action has encouraged both Aqaba and Eilat municipalities to publicly express their objection to the fish farms, in recognition that they are polluting their common waters. Because the cities of Eilat and Aqaba are at the southern edges of their respective countries, from a cooperative perspective they are less influenced by the politics of the region. Therefore, effective cooperation has been able to proceed both in terms of oil spill prevention, NGO public awareness and monitoring of the gulf's unique reefs. The survival of the coral reefs and the promotion of sustainable development in this unique desert ecosystem are, however, far from guaranteed, and will require political commitment and continued environmental cooperation. In this regard, Arab objections should be lifted, permitting Israel to become a party to the 1982 Jeddah Convention, formally known as the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment.

The global economy, global environmental cooperation and Israeli responsibilities

International cooperation is specifically referenced in Chapter 2 of Agenda 21, which details the commitment of developed countries to assist developing countries. Issues such as mutually supportive environment and trade policies, debt relief and the obligation to provide financial aid to the developing world are all detailed in Agenda 21.

Although Israel is a small country in size, with a relatively modest population of presently just over 6 million people, its impact on the global economy and exploitation of the world's natural resources is dispro-

portionately high, reflective of its developed economy. Like many developed countries, it has not conceived a strategy to combat its disproportionate consumption of natural resources. Although a recent NGO/Ministry of the Environment initiative does seek to advance the concept of sustainability and ecological footprint, most government circles in Israel are ignorant of the concept and it is unfortunately not integrated into decision–making.[21]

The obligation to meet international treaty and convention commitments related to the environment, is part and parcel of meeting one's international responsibilities regarding the environment and sustainable development. For the most part, Israel has taken its international environmental obligations very seriously, not ratifying a convention before it is certain that it will comply with its terms. Though Israel is therefore a signatory to most international environmental conventions, it is lagging behind in fully implementing the amendments and protocols on some key agreements. Despite an undertaking in Monaco in November 2000 to accept the amendments to the **Barcelona Convention for the Protection of the Marine Environment and Coastal Region of the Mediterranean** and several of its protocols, to the date of publication of this Shadow Report, acceptance has yet to take place.[22] Similarly, Israel has yet to ratify the **Kyoto Protocol** concerning climate change, or the 1997 Amendment to the **Montreal Protocol**, concerning the protection of the ozone layer.[23] Further, Israel did not join the **Aarhus Convention,**[24] nor sign on to the **Cartagena Biosafety Protocol**.[25] Both are important conventions that would well compliment Israel's existing legislation on the public's right to know. Since Israeli industry is increasingly seeking to be active in biotechnology issues, it is of utmost importance that the government agree to comply with the international treaty that regulates such activity.

Critique of Government Report to WSSD

Cooperation at regional level

The Israeli Government Report to the WSSD does touch cursorily upon regional environmental issues and gives some positive examples of co-operation, such as a program to clean up oil spills in the Gulf of Aqaba. However, there is no discussion in the report of the importance of regional cooperation in the Middle East context, as indispensable for the promotion of sustainable development as envisaged under Agenda 21. While a just and fair settlement of the Israeli–Palestinian conflict is urgently required, the resolution of the conflict cannot be a prerequisite for environmental cooperation between the respective authorities. The irreversible nature of the damage currently being done to the environment in the region, at the

expense of both present and future generations, must be the true focus of concern.

Over the last decade, depending on the current state of political affairs, Environment Ministers from both Israel and the Palestinian Authority have done too little to create effective cooperation on environmental issues. In comparison, civil society groups from all sides have been at the forefront of cooperative endeavors on environmental issues, throughout all the ups and downs of the peace process.[26] Awareness campaigns, and research undertaken on environmental health issues, bird migration and shared ecosystems (such as the Dead Sea and the Gulf of Aqaba), as well as common environmental education programs, have brought measured benefits to the respective communities. Civil society groups have indeed been the catalyst behind most of the cooperation that has taken place at the government level and have been exemplary in their message that the environment cannot wait and that the people of the region can work productively together towards a common goal.

All parties in the region need to recognize that the lack of regional cooperation in the government arena on environmental issues will have an impact for generations to come, well after peace is finally obtained. The environmental consequences of non–cooperation need to be assessed, by all sides to the Middle East conflict, as an additional and heavy cost to pay for the non–resolution of the political conflict in the region. Greater international support and intervention is needed, especially by international environmental and developmental institutions, particularly since much of the rich environmental and cultural landscape of the 'Holy Land' is much valued worldwide. The fact that both the Israeli and Palestinian environmental authorities recently agreed to a UNEP desk study and mission to the region is an important step that might lead to renewed dialogue and intergovernmental cooperation, so urgently required.

Blanket support for liberalization

It is disappointing that the Government Report to the WSSD expresses across–the–board support for trade liberalization, deregulation, and privatization policies, without any recognition of their impact on environmental and social issues. This is contrary to the more balanced approach to trade and environment promoted under Agenda 21. The concern expressed here is that an unbalanced approach will lead to further concentration of wealth, further handicapping of minority groups, unsustainable consumption and production patterns, and the accelerated depletion of the natural resource base.[27] In all sectors—be they water, air quality or open spaces—the

economic incentives promoted by neo–liberal policies such as trade liberalization have, for many parameters, moved Israel further away from sustainable development over the last decade.

Trade liberalization at the bilateral and regional level:

At the bilateral and regional level, government policies (particularly those associated with the advance of the Peace Process) have promoted trade liberalization without sufficiently taking into account environmental and social considerations. The building of industrial estates near border areas between Israel and Jordan, and Israel and the PA, has insufficiently taken into consideration the loss of open spaces and damage to unique cultural and natural sites. The building of an industrial estate by the banks of the River Jordan despite tentative World Heritage nomination for the site, is an unfortunate example of how short–term political and economic interests are being advanced at the expense of sustainable development.[28] Lower environmental standards in neighboring countries require agreements that would ensure the upward harmonization of environmental standards when undertaking cross–border economic activity, including adequate guarantee of worker's social rights.

At the Euro–Mediterranean level, Israel is a signatory to an association agreement with the European Union and is committed to the creation of a Euro–Mediterranean Free Trade Zone (MFTZ) as part of the Euro–Mediterranean partnership. This is despite the absence of adequate environmental measures in place to guarantee that environment and trade issues are mutually supportive, as required under Agenda 21. Real concerns for the creation of pollution havens exist due to the unbalanced approach taken by the Euro–Mediterranean partnership.[29] A recent hearing in the Israeli Knesset, however, has sponsored debate that Israel should legislate for sustainability assessments to be mandated prior to the signing of any free trade agreements, including the creation of the MFTZ. Initial support has been noted from the Ministry of Environment for this measure, and all parties await the opinion of the Israeli Commissioner for Future Generations, who was requested to prepare an opinion on the issue to the Knesset Economic Committee.

Israeli Assistance to Developing Countries

Though assistance to developing countries is mentioned in the Government Report to the WSSD, Israel is not allocating anywhere near the Agenda 21 target of 0.7% of GNP from its own national budget for development assistance. In 2000, Israel reported its overseas assistance as 0.15% of GNP, though this figure included sums spent on assistance to new immigrants coming to Israel from developing countries (former USSR states and

Ethiopia).[30] Without assistance to new immigrants, the figure of support by Israel is as low as 0.087%. It is unfortunate that proposed legislation in 2000, aimed at ensuring that Israel mandate increased support to development assistance, was not brought to the government.

As to the nature of the assistance given by Israel, much of it is in the agricultural sector, often supporting agricultural policies that seek to combat desertification. Although Israeli technology and expertise has considerable benefit to the agricultural sector in developing countries in promoting water efficiency, it will encourage unsustainable development if it fails to take into account sufficiency and carrying–capacity considerations. There is a need for Israeli legislation mandating sustainability assessments of all Israeli foreign assistance.

What is not mentioned in the Government Report?

Environmental justice issues between Israelis and Palestinians

The words "Palestinian" or "Palestinian Territories" do not receive any mention in the official Government Report. Since Israelis and Palestinians in practice share the same land, from an ecological perspective there can be little meaningful discussion about sustainable development issues in Israel without mention of Palestinians and their development needs and impacts. It is the opinion of the authors that any solution to Israel's environmental problems cannot be found in isolation from those of the rest of the region, and hence regional environmental issues should have received focused attention in the Government Report. In many cases, Israeli development actions impede sustainable development in Palestinian areas and, in some cases, especially in relation to sewage flows, Palestinian development actions impede sustainable development in Israel.

The principle of environmental justice is key to sustainable development and must be applied to the regional as well as the national level. Reaching a state where both land and water resources are fairly shared by Israelis and Palestinians goes to the heart of the Israeli–Palestinian conflict. Each side needs to recognize the other's right to live on the land and share its resources in accordance with sustainable principles. At this time of continuing violence between the two peoples, environmental justice issues are so heightened that they often become humanitarian issues. For example the provision of drinking water to all Palestinian cities and villages at all times must be a minimum requirement guaranteed by Israeli military action even in response to a violent "Intifada". A recent report of the World Bank esti-

mated damage to Palestinian infrastructure after the April and May 2002 Israeli military strike at $360 million.[31] Damage to water, sewage and solid waste infrastructure alone was estimated at over $15 million.

Transboundary avoidance of Israeli environmental laws

Real concern is expressed on what appears to be a strategy by some government ministries to avoid Israeli environmental laws by either moving large development projects to neighboring countries or initiating joint projects by establishing facts on the ground in the neighboring country. Israeli government officials have publicly justified the proposed building of the Red–Dead Canal wholly in Jordan as a means to avoid the 'impediment' of the Israeli environmental community. Commencement of the building of the Jordan Gateway Industrial Project on the Jordanian side of the River Jordan, well before deliberations in the Israeli planning process and in spite of heated objections by the environmental community, including initially the Environment Ministry, goes contrary to the spirit of cooperation and the spirit of the Treaty of Peace between Israel and Jordan. Too often in the search for peace, and in the belief that concrete joint economic projects will cement that peace, environmental issues have been quickly pushed aside.

Israeli corporate accountability

Should the movement of Israeli industry out of Israel into neighboring countries become more pronounced, there will be a need to impose corporate accountability principles on Israeli industries moving plant facilities to neighboring countries or indeed anywhere else in the world. A good example of initial responsibilities to be imposed on local companies relocating plants overseas is the recently ratified US–Jordan Free Trade Agreement. Under this agreement, US companies must apply at least some of the more strict US environmental standards when investing in Jordan. The same and more extensive accountability principles should be imposed on Israeli companies investing in the region and in developing countries in particular.

Recommendations

In order for Israel to better meet its Agenda 21 and other international environmental obligations, the authors call for the following:

- Israel should encourage third party support to try to reactivate inter–governmental transboundary environmental cooperation. With forecasts that, by 2030, if current pollution levels continue on the Mountain

Aquifer (Palestinian and Israeli), the waters will be so polluted that they will not even be drinkable, a crisis is in the making and must be avoided.

- Israel and her neighbors should develop a specific regional sustainability strategy, with targets, timelines and commitment of financial resources. The strategy must deal with urgent issues, such as equitable water allocation (most urgently to the 180 Palestinian villages still not connected to any water system), protecting shared water resources (sewage and solid wastes) and sustainable management of shared ecosystems, such as the Gulf of Aqaba, Dead Sea and Eastern Mediterranean coastline.
  Mechanisms should be established to overcome the problems posed by the existence of different zones of political control (Areas A, B and C) established under the Oslo Accords.
  If, at this time, this process cannot be undertaken regionally, then Israel should launch this process unilaterally with full public discussion, and seek to include neighboring countries' participation as soon as practical.

- Greater efforts should be made by Israel to ensure that military actions do not destroy Palestinian infrastructure essential for environmental protection and natural resource management. Clear instructions must be given to the military not to damage water pipes, sewage infrastructure or water tanks, and not to cut down trees; garbage collection and disposal to appropriate sites must be maintained. Investigation of alleged breaches should take place with prosecution of offenders.

- Specific agreements need to be entered into between Israel and her neighbors with the aim of upward harmonization of environmental standards for joint projects. This is due to the concern that lower environmental standards are attracting Israeli business to neighboring countries.

- Sustainability assessments need to be undertaken prior to Israel's signing of additional trade agreements, including an assessment of the environmental and social impacts in Israel of the existing WTO and MFTZ trade agreements already signed.

- Corporate accountability legislation needs to be promulgated to regulate the activities of Israeli–owned business overseas, with the aim of setting minimum environmental and social standards when investing in the developing world.

- Israel needs to set a timetable to meet Agenda 21 commitments on foreign assistance. An environmental review of current Israeli development assistance is needed to ensure that sustainable policies are being promoted, particularly in agriculture.

- Israel is called upon to ratify, preferably prior to the Johannesburg Summit, international environmental agreements such as the amendment to the Barcelona Convention and its protocols, the amendment to the Montreal Protocol, and the Kyoto Protocol, and sign on to the Aarhus Convention and Biosafety Protocol.

Notes

1. For a good overview of the issues, see Longerman and Brooks*: "Watershed—The role of fresh water in the Israeli Palestinian conflict*," International Development Research Center (IDRC), 1994.

2. UK Foreign and Commonwealth Office: "*Water in the Middle East Peace Process*," May 2000.

3. Israeli–Palestinian Interim Agreement on the West Bank and the Gaza Strip (The Oslo Peace Accord), 1995, Article 12 deals with environmental protection and Article 40 deals with water and sewage.

4. Nassereddin, Chapter 7 in Feitelson and Haddad, "*Management of Shared Ground Water Resources*," IDRC, 2000.

5. Israeli water consumption rates are 280–300 liters per person per day while Palestinian rates are 50–80 liters on average. See Kliot, "Environmental Conflicts and Environmental Security—Israeli and Palestinian Perspectives," *Studies in the Geography of Israel*, Vol. 16, 2002 (Forthcoming, Hebrew).

6. Ibid.

7. UK Foreign and Commonwealth Office: "*Water in the Middle East Peace Process,*" May 2000.

8. Palestinian Ministry of Planning and International Cooperation, "*Water and Wastewater Existing Situation, Regional Plan for the West Bank Governorates,*" 1998.

9. Kliot: "Environmental Conflicts and Environmental Security—Israeli and Palestinian Perspectives," *Studies in the Geography of Israel*, Vol. 16, 2002, (Forthcoming, Hebrew).

10. Ibid. See also the issue of illegal dumping of Israeli solid wastes in Palestinian Areas in Eyal Artzi, Shadow Report Chapter "Environmentally Sound Management of Solid Waste."

11. Ibid.

12. WECUP: "*Regional Peace Initiative*", 2002.

13. Kliot: "Environmental Conflicts and Environmental Security—Israeli and Palestinian Perspectives", *Studies in the Geography of Israel*, Vol. 16, 2002 (Forthcoming, Hebrew).

14. Geographical Institute of Israel, "*Concealed Sinkholes Detection in the Dead Sea Area*" May 2000 and *Maariv Newspaper* article, "The Next National Disaster," 22 June, 2001 (Hebrew).

15. FoEME: "*Let the Dead Sea Live—Concept Document*", 2000.

16. Philip Warburg, Editor, "*Protecting the Gulf of Aqaba*," Environment Law Institute, 1994.

17. Atkinson, "*Evaluation of Pollution in the Gulf of Eilat*," Report for Israeli Ministries of Infrastructure, Environment and Agriculture, December, 2001.

18. Munir Adgham, Chapter 20, in Philip Warburg, Editor, "*Protecting the Gulf of Aqaba*," Environment Law Institute, 1994.

19. Atkinson, "*Evaluation of Pollution in the Gulf of Eilat*," Report for Israeli Ministries of Infrastructure, Environment and Agriculture, December, 2001.

20. See David Dunetz, Shadow Report Chapter "Education for a Sustainable Society in Israel" and Yaacov Garb, Shadow Report Chapter, "Population Dynamics and Sustainability in the Israeli Context."

21. See GreenPeace, *National Profiles Report to Monaco Conference of the Parties, Barcelona Convention*, November 2001, and see, UNEP/MAP

website under "Status of Signatures and Ratification" at www.unepmap.org.

22. For a detailed discussion, see Philip Warburg, Shadow Report Chapter, "Air Pollution, Ozone Depletion and Global Warming."

23. The UNECE Convention on Access to Information, Public Participation in Decision–making and Access to Justice in Environmental Matters, June 1998.

24. The Conference of the Parties to the Convention on Biological Diversity adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety, on 29 January 2000.

25. See IPCRI, "*Our Shared Environment Conference Reports*", 1994, 1995 and 1996

26. For more information, see Shadow Report Chapters, Raid Fadila and Marganit Ofir–Guntler, "Minorities in Israel," and Barbara Swirski, "Combating Poverty."

27. FoEME, "*World Bank Support for Gateway Project: The Beginning of the End for a Holy River*," 2000.

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MANAGEMENT OF WATER RESOURCES IN ISRAEL

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Despite the fact that its technological expertise in the realm of water use is among the most advanced in the world, Israel is in the throes of an ongoing water crisis, which is becoming progressively more serious, bringing the country to the verge of catastrophe. The damage to the country's three main reservoirs, as a result of excess pumping, salination and contamination, has not been adequately addressed at the systemic level, and no master plan exists to guide the activities carried out by the many bodies entrusted with authority for water management in Israel.

A review of present policies and subsequent reform are urgently needed, and the water problem must be accorded priority on the national agenda, in light of the guidelines suggested by Agenda 21, in order to achieve a balanced and sustainable water management policy. This chapter surveys the various problem areas and proposes strategies for addressing them.

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Introduction

Water quality and quantity are two of the most urgent environmental problems facing Israel over recent years. Located in a semi–arid region, Israel suffers from ongoing damage as a result of over–exploitation and contamination of its meager water sources. With the addition of the anticipated effects of climate change, the country is likely to face a continual decrease of precipitation during the coming decades, followed by a dwindling water supply from its wells.

According to some indicators, such as life–expectancy and per–capita income, Israel is considered a developed country. According to other indicators, however, such as growth–rate of the population, population density, and its semi–arid climate, Israel is more properly classified as a developing country. From the 1950s until the present, nearly all of the natural water sources (90%) have been consolidated and managed by the Water Commissioner. All Israeli residents living in officially recognized communities receive a constant supply of tap–water. Seventy percent of sewage water is collected and treated at some level or other.

In comparison to countries with abundant water sources, the average residential water consumption rate in Israel is not high, amounting to about 324 liters daily. In the West Bank this level of consumption drops sharply to about 50-80 liters daily. (For comparison's sake—California residents consume around 2000 liters daily).

In 1959, the Israeli legislature passed a comprehensive Water Law which, at the time, was one of the most progressive in the world, equipping the state with a system of laws and regulations governing water quality and treatment. According to the Water Law, Israel's water sources are considered public property, to be managed by the Water Commissioner. The Water Law grants the Water Commissioner far–reaching authority:

- to determine water use and its allocation to various sectors;
- to control pollution and manage water quality;

to determine the amounts of water to be pumped and to limit pumping when necessary.

However, despite the establishment of the Kinneret (Lake of Galilee) Authority, the Drainage Basins Law 1957, and the River Restoration Administration, by the Rivers and Springs Law 1993, the condition of rivers in Israel has not improved, but has actually deteriorated. Despite the water

regulations, which were amended in 2001, ongoing surveys reveal a broad variety of pollutants as well as increased salination of water resources.

The current water crisis is the product of a long history of management failures, lack of leadership and negligence, for which ultimately a succession of Israeli prime ministers and ministers should be seen as responsible. Instead of choosing a path of long term sustainable development, everyone involved in water management in Israel has opted to over–exploit Israel's limited water resources, to spoil and ultimately exhaust them.

The current system of water management in Israel, as presented in the Governmental Report, is not sustainable, based as it is on maximum exploitation, exceeding the replenishing capacity of the resources. The Water Commission has drawn "red lines" for every single reservoir, below which water must not be exploited. Yet narrow sector-based and political interests have eroded all of these lines. In fact, the actual water levels have fallen well below the red lines, with the full knowledge and consent of the government. Israel's water crisis, therefore, can be characterized as the result of non–enforcement of regulations, misguided strategy, lack of long term planning, and a mismatch between levels of consumption and available water resources.

A wide chasm divides the law, theory and official policy of water management in Israel from its actual practice. Thus, for example, due to over–pumping and over–exploitation since the 1970s, the levels of salinity and of pollution have been constantly on the rise, there is no watershed management strategy, resulting in the pollution and drying out of wetlands. Preferential allocations to the agricultural sector and the myopic approach of the economy's leaders have caused an irreversible dwindling of water resources, with little view to the future. The government, headed by the Ministry of Finance, has refused over the years to invest sufficient resources in pollution prevention, in purification of polluted water, or desalination of brackish water.

Today Israel faces an impasse. For the past year and a half the Water Commissioner has warned that the consumption of fresh water in Israel is not commensurate with the available resources. The former Minister of the Environment even declared that 40% of the water in Israel was unfit for consumption because of salinization and pollution. The following is a quote from the former Minister for the Environment, Ms Dalia Yitzik, as recorded in the ministry's own publication:

> The current water crisis in Israel should not come as a surprise to anyone. The writing has been on the wall for years. Yet, shortsighted interests have allowed

> economic considerations to transcend environmental considerations. Instead of investing in desalination facilities and upgrading wastewater treatment plants, we paid little heed to our precious water sources. We watched unconcerned as water quantities in our aquifers dropped. We remained indifferent to the growing contamination of our water sources. Despite countless warnings about the impending water crisis by hydrologists and environmentalists, our decision–makers preferred non–action to action.

The difference between the rate of recharge to the rate of water consumption in Israel ranges from 350 MCM per year (a conservative estimate) to 600 MCM (according to other estimates), amounting to 30–50% of the water consumed in 2000. When compared with an average year, (based on the average of the past 30 years), the amount of water missing from the reservoirs in 2001 was 518 MCM. That year was characterized by a drop of the water in all reservoirs to the lowest points in documented history.

In February 2000, the government set up a National Information Head-quarters for Water Conservation with the goal of reducing domestic consumption by 10%. The center spent an extravagant 2.5 million USD in advertising, but the gains were minimal, amounting to no more than 1.5% conservation in the household sector, in contrast with the 10% target. These poor results suggest that the public disagreed with the leadership in respect to the water crisis. In July 2001, the Knesset, Israel's parliament, decided to establish a parliamentary commission of inquiry, which was authorized to investigate the causes behind the water crisis, to find out who was to be held responsible for the situation and to propose remedies. The report was published by the Knesset in June 2002 but has not yet been brought to government. It is doubtful whether its recommendations will be met.

The public has made clear demands, through actions of environmental groups and reports in the print and electronic media, that the government reduce further allocation of water to agriculture and expedite plans to begin projects for desalination of sea water and for reuse of treated effluent. The demands also call for a stringent enforcement campaign against polluters of water sources. The Water Commissioner, too, has requested approval for a proposal that the fresh water supply for agriculture and for public and private parks and gardens be drastically reduced, but lobbyists from the gardening local government and agricultural sectors succeeded in preventing the significant measures that the Commissioner wished to implement.

The international commitments that Israel took on to provide water to neighboring Jordan, subsequent to its peace treaty with that country, were made despite full knowledge concerning the implications for Israel's water system, and the possible long term consequences of this commitment. The

Water Commissioner reports that Israel is currently in fulfillment of its commitment to Jordan, as well as toward the Palestinian Authority, under the agreements signed with them. Nonetheless, these commitments will grow harder to meet if the region is not blessed with a succession of rainy years during the near future.

Water pollution

The drinking water that Israel provides to its residents is taken from the Kinneret (the Lake of Galilee, or the Jordan River watershed) and from various aquifers. Replenishment of water resources varied highly from year to year. Replenishment of three main water reservoirs (Lake Kinneret' The Yarqon –Taninim Aquifer and the Coastal Aquifer) ranged in the past 60 years from 600 MCM/yr to 2700 MCM/yr with the mean of 1350 MCM/yr and a standard deviation of 420MCM/yr. (Israel World Study for the Word Bank. 1933 Ben Gurion University & TAHAL)

The quality of the groundwater in Israel is spoiled primarily as a result of anthropogenic factors, in addition to natural ones. All the water sources in Israel show increased salinization over the past decade. Intensive human activity is the most important cause of both point and non–point source pollution. Pollutants from untreated runoff, and nitrates from fertilizers used in agriculture, percolate into the ground water; crops are irrigated with minimally treated sewage; gasoline leaks, and untreated industrial wastewater are other sources of pollution infiltration. Some 10% of the drinking water wells in the coastal aquifer have been shut down because of excess pollutants. In particular, chloride concentrations have been measured well above the agreeable 250 mg per liter. In addition, there has been a steady rise in nitrate concentrations. For example, 60% of the coastal wells contain high levels of nitrates that are considered health hazards at present concentrations by most European countries. Environmental groups have long claimed that 70% of the water from the wells of the coastal aquifer is unfit for drinking.

Neglect of the pollution problem is a result of misguided strategy: instead of desalinating and purifying the polluted water, it is mixed and diluted with cleaner fresh water. For example, the more saline water from the Lake of Galilee-Kinneret is mixed with the better quality water from the central mountain aquifer. The over–pumping practiced in all of the country's reservoirs causes a steep drop in the water quality as a result of infiltration/intrusion of brine. In effect, the problem is treated in an inverted fashion: instead of treating the pollution problem, wells for drinking water

have been shut down over the past 15 years, because of the presence of various pollutants.

In Israel, many industrial zones and agricultural lands are situated near residential areas. Consequently, water for irrigation, sewage systems, and drinking water lie in close proximity to each other, and the local authorities are at a loss to protect the drinking water. Cases of water mixtures occur, despite the existence of regulations that require installing devices to prevent backflow and the preservation of a protective radius around water wells.

On a more positive note, Ministry of Health data indicate that there has been a constant improvement in the levels of microbial contamination in water supplied to residents by the local authorities, during the years 1996–1999, with the number of outbursts of gastrointestinal infections decreasing during the years 1976–1999, and no outbursts at all registered in 1998 and 1999. This improvement is a result of reasonable compliance with the requirement to disinfect all provided water. However, the requirement to filter the water from the Lake of Galilee (Israel's only source of surface water) was not carried out until recently. Prior to that, installation of a central filter was delayed, from 1992, due to the Ministry of Finance's unwillingness to allocate the necessary resources.

Industrial plants, waste sites, and gasoline stations are a major cause of soil and water contamination. No centralized source of information exists about sources of contamination from industrial effluents and waste runoff. Enforcement against polluters and illegal waste disposal is insufficient. Between the years 1996–1999 for example, only 30 complaints were filed against industrial polluters. This is negligible compared to the number of actual transgressions. While the number of cases initiated has increased considerably during the past two years, the level of enforcement and severity of penalties is still woefully inadequate.

Law enforcement authorities in Israel, including the Environment Ministry, do not do enough to find the guilty parties, or to prosecute them, forestalling any application of the "polluter pays" principle. This past year, for example, an article published the discovery of carcinogenic materials and principle heavy metals in fish caught near the outlet of the Greater Tel Aviv sewage facilities. Seventy-five industrial plants were listed as suspects but the relevant authorities ultimately chose not to file any charges. In 1997, during the opening ceremony of a national sporting event, four athletes died when a bridge collapsed and they were exposed to the contaminated Yarkon River waters. Yet no legal action was taken against polluters.

A study conducted by the Ministry of the Environment to examine fuel containers in gasoline stations found that 40% of the containers were leaky,

causing contamination of groundwater. Only a few of the polluting gasoline stations were indicted. The regulations requiring sealing of gasoline containers, as outlined in the governmental report, apply only to the new fuel stations.

On the other hand, several positive steps have been taken toward preventing pollution from industrial and waste sites. For example, the Ministry of the Environment has enacted regulations requiring industry to discharge salt brine residues into the sea, rather than into the sewage system. During the past year, the Environment Ministry has acted vigorously to shut down illegal waste sites, which were a major source of groundwater contamination. These sites still must be removed and the soil underneath them restored, to prevent further pollution.

Information about water quality and social costs

In Israel, citizens are unable to receive information about the quality of the water supplied to their homes, despite recently enacted regulations. Notwithstanding recent amendments, Israel's water standards still lag behind European standards (in particular as regards nitrates and other inorganic minerals). The maximum concentration of nitrates that the WHO allows in drinking water is 45 mg per liter, while the Israeli standard was 90 mg, with 60 mg set as a target for 2006. The recommended concentration of chlorine is 250 mg per liter, while reports in Israel mention 600 mg of chlorine per liter as permissible in drinking water. The Health Ministry has failed to upgrade standards to levels acceptable in other developed countries.

No central source of information exists in Israel, which can supply reliable information about water quality to residents. The sampling data, which is collected by the Ministry of Health according to law, are not published except in internal Ministry reports that receive no other public exposure. This vital information does not even appear on the websites of the relevant government ministries. In contrast, the National Headquarters for Water Conservation has made use of several public media, including the Internet, to educate the public about water conservation in the private sector.

The public does not have reliable data about the quality of the water it receives from the local authorities. This has led a large segment of the population, among those with the financial means to do so, to effectively vote no confidence in publicly supplied water by increasing consumption of bottled mineral water. The price of bottled water may be as much as 1000 times greater than tap water. Similarly, a large market has developed for

household water purification systems, despite the fact that their utility is questionable.

Sewage

In 2000, recycled sewage effluents provided 25% (265MCM) of the consumption of the agricultural sector, but ever since the 1990s, little advances have been made in this area. No comprehensive national survey about the composition of sewage has been conducted during recent years. Given the assumption that more sewage is produced, and because the percentage of reused water has not increased, it is reasonable to conclude that more untreated sewage ends up in the environment. Data from 1994 indicates that 32% of the sewage undergoes advanced treatment, 8% undergoes secondary treatment, and most undergoes partial treatment, while 17% of raw sewage is discharged into rivers or into the sea. It is worth mentioning the disparity that exists between the investment in sewage infrastructure in Jewish towns and Arab villages and cities. Sewage treatment in the Arab sector lags behind that of the Jewish sector and needs special affirmative action.

It is also clear that the pretreatment by many Israeli industries is extremely poor, leaving chemicals in the municipal waste system, which cannot be broken down by the conventional sewage treatment. This leads to the systematic distribution of industrial solvents, metals and other contaminants by Israeli farmers as they irrigate, and such chemicals have been found in trace quantities throughout Israel's rural aquifers.

No good definition exists for effluents, which are vaguely defined based on generic European standards, with a minimal concentration of 20-30 BOD suspended solids. Some claim that this standard was politically determined. Tests indicate an increase of minerals in groundwater, and also infiltration of carcinogenic chemicals. Irrigation with low–grade treated sewage damages the soil over time, impairing the sustainability of the environment. Indeed, many experts argue that Israel's historical eagerness for wastewater recycling in agriculture has had disastrous consequences for ground water salinity. Without advanced wastewater treatment to drinking water levels, they believe irrigation with effluents should be discontinued. In actuality, in respect to uses of treated sewage no overarching policy exists that takes all the needs and problems into consideration.

Rivers and water as a resource for natural ecosystems

Israel has 12 main rivers and streams that flow into the Mediterranean, and 15 that flow into the Jordan river and the Lake of Galilee. In the past, most

of the rivers were perennial, with the water–flow producing rich natural habitats. Today, virtually all of Israel's rivers and wetlands (97%) have dried out, and are polluted by a layer of toxic sludge originating in industrial effluents, agriculture effluents, municipal sewage, and highway runoff. The streams are filled with heavy metals, chemical compounds, and carcinogenic and toxic materials. Alongside the lack of enforcement against polluters, and the ongoing pollution, these surface water sources are pumped into the national water carrier system, leaving the rivers with little or no flow of fresh water. In addition, the recent drought years and excess pumping have reduced the natural output of the springs. For example, the Betzet Stream in the Western Galilee stopped flowing when its sources dried out in 2001 because of over–pumping carried out at a higher elevation point in the river basin. The Ministry of the Environment's attempt to promote a river reclamation program has been stymied as a result of a chronic lack of fresh water or purified water supply for the riverbed. Allocations to nature take a back seat to other anthropogenic needs. Given the lack of fresh water, a strategic decision was taken in the 1990s to reclaim rivers by supplying them with secondarily treated effluents. Yet during the current crisis, even this is often not carried out.

As mentioned, the condition of Israel's rivers has become so bad that when people fell into a shallow river and swallowed the contaminated water, a number of them died and dozens became ill. Many cases of cancer were recently diagnosed among veterans of the Israeli Navy seals commando unit who had conducted practice dives in the Kishon River, which drains into Haifa Bay. The Kishon area, home to many of Israel's largest petrochemical industries, is considered to be the most polluted of Israeli streams and rivers. The government established a commission of inquiry headed by former Supreme Court Chief Justice, Meir Shamgar, to investigate the sources of the Kishon pollution and the circumstances behind these incidents of disease. As a result of an interim report, the Navy suspended its maneuvers in this stream, but this step was too late for the hundreds of veterans who may soon manifest the results of their protracted exposure to an extremely virulent toxic cocktail.

Misguided strategy and poor leadership

In spite of the fact that Israel's water scarcity has been known for years many actions taken by politicians ignored it. The role of the newly–established state was to "make the desert bloom", through the development of sophisticated modern agriculture. Fueled by this ideological zeal, the

government was convinced that it must encourage agriculture and supply agricultural settlements with water at subsidized prices.

Since the 1970s, the water resources of the country have been in a state of "overdraft." Water reservoirs "go into the red," while administrators cling to the hope that next year's rains will replenish them. Because demand for water is constantly on the rise, supply keeps on decreasing. Experts warn that over–pumping can be practiced only under the condition that water quality is not jeopardized, and that irreversible processes are not set in motion. Regarding the current crisis, it is fair to say that the writing has long been on the wall, and that the warning calls were sounded at every level by scientists, public interest groups and even a few intrepid politicians. Yet, these warnings were not heeded, and policy was never revised to reflect the changing hydrological reality.

The Treasury's economists have operated on the assumption that water was not a scarce resource, and that all that needed to be done was to raise water prices, in order to adapt demand to supply. Their efforts, however, met with little success due to the political power of the agricultural lobby and a national commitment to farming. Yet, while demand management stalled, for more than two decades the Ministry of Finance blocked efforts to promote desalination and sewage treatment projects. Only recently, in the midst of the present crisis, did it succumb to increasing pressure from experts and from the public and approved a series of desalination plants that will eventually provide about 400 MCM per year.

The Finance Ministry has also been responsible for the delay of a massive investment in additional water infrastructure. Only recently, in July 2000, did it approve measures such as disbursement of grants for development of sewage recovery systems, well rehabilitation, desalination of brackish water, connecting private water producers to the network, as well as promotion of conservation measures in the municipal sector. In one of the great paradoxes of Israeli water policy, water fees to residents have served as a source of income for municipalities and local authorities, which mark up the price after paying Mekorot (the national water utility), and then reap windfall profits. This policy encouraged wastage of water, and was reformed only in 2001. Even if all the above measures are implemented in full as planned, it is hardly clear they will succeed in compensating for the huge cumulative deficit of the past decade.

Historically, efforts to raise the real price of water for agriculture were repeatedly blocked by a strong agriculture lobby. Even in 2001, at the height of the water crisis, the Prime Minister intervened in the professional decisions of the Water Commissioner and prevented additional cutting water allocations for agriculture, while he simultaneously approved lowering the

red lines in all the reservoirs and the continuation of over–pumping. These actions were in direct contradiction to all the professional recommendations of the Water Commissioner, as well as those of experts from the scientific community. At the same time, with municipal water demand more inelastic, the increase in prices for the household sector did not yield the intended decrease in consumption.

Institutional concerns

The post of Water Commissioner has occasionally become politicized with appointees who serve the interests of the agricultural sector. Several Water Commissioners made decisions contrary to professional recommendations, and when non–political independent Commissioners were appointed, politicians obstructed their decisions, refused their requests and acted against their policies. Indeed, the tenure of such "professional" commissioners has been short, as politicians expedited their hasty dismissal.

The decentralization of authority in the sphere of water management in Israel is one of the underlying causes of the present crisis, and reflects Israel's "inverted" strategy. Each of the following ministries plays a part in the maintenance of Israel's water system: Finance, Health, Industry Environment, Agriculture, Interior (responsible for the municipal authorities), and the Ministry of National Infrastructures. The diffusion of authority undermines cooperation, comprehensive planning, coordinated and efficient operation, and an approach that takes the complexity of the system into account. The Ministry of Building and Housing, for example, reached the advanced stages of building a new city, Modi'in, without including the necessary sewage treatment plant, allowing sewage to be released into an inappropriate facility. Without the action of environmental NGOs who petitioned the Supreme Court, the city would still be without its own modern sewage treatment facility. Another example of the lack of comprehensive planning is the building of major highways (e.g. the Trans–Israel Highway), without any proper protection measures to capture and treat runoff, even when it clearly would reach water sources that supply drinking water to roughly 2 million inhabitants.

Activities of environmental organizations

Life and Environment, (the umbrella organization of environmental NGOs in Israel), has long been active in issuing warnings about the impending crisis,

and in the attempt to bring information about the state of Israel's water economy to the awareness of the public and the relevant authorities. It has also acted to educate the public about conservation methods, and promotes the involvement of public representatives and members of parliament in addressing the water crisis. The environmental NGOs organized several conferences in 2001 to which the public was invited to learn about conservation methods, prevention of pollution from industry and agriculture, conservation technologies in the municipal sector, allocation of water for river reclamation, and more. Thousands of people attended these conferences, the first of their kind in Israel, including representatives of various authorities, decision–makers, and the public at large.

In addition, the Israeli environmental movement has committed itself to work for better enforcement of existing legislation regarding water and prevention of pollution. Several court actions have been filed by Adam Teva v'Din, the Israel Union for Environmental Defense: to promote the installation of municipal sewage treatment facilities in cities like Safed, Ramla, Lod, Modi'in and Ra'anana; to confront the policy of closing down polluted wells; and to oblige the authorities to install a filter for the water originating in the Kinneret. The organization's suit against major polluters along the Kishon River led to a court–authorized agreement for construction of multi–million dollar industrial treatment processes, full compensation for losses to fishermen who joined the suit and the creation of an area environmental research fund. The Society for the Protection of Nature in Israel recently petitioned the Supreme Court to prevent a further lowering of the red line in the Kinneret reservoir. Life and Environment, in cooperation with the Forum for Public Transportation in Israel, and many other organizations, petitioned the Supreme Court in an attempt to prevent construction of the Trans–Israel Highway along Israel's water drilling lines, on the outskirts of the densely populated Tel–Aviv Metropolitan area (Gush Dan). A local grassroots organization in Modi'in petitioned the court, requiring that the authorities draft a comprehensive water and sewage purification plan for the city.

Other local organizations carry out activities that encourage the public's involvement in various areas, such as the exploitation of gray water, rehabilitation of a well in an Arab village (LINK for the Environment) or in a new desert settlement (SABABA) as well as rehabilitation of polluted rivers (Israel Forum for Ecological Art).

Environmental NGOs are active in the Israeli parliament, working to promote legislation that will protect water sources and prevent pollution. The center for policy at the Arava Institute for Environmental Studies has also set up a working committee to reform Israel's Water Law. Several proposals drafted by its researchers are currently on the Parliament's

docket—including bills that would expand self–reporting by industry, make water quality violations subject to administrative fines, require greater water allocation for natural ecosystems, expand public representation on the National Water Council and prohibit over–pumping by the Water Commissioner.

Conclusions and key recommendations

This chapter recommends that reform of Israel's water management policy be placed at the top of its priorities, in accordance with the philosophy governing Agenda 21. As the Middle East peace process ultimately gets "back on track," Israel will have to confront the water needs of its Palestinians neighbors, needs that it recognized as legitimate in the Second Oslo Accord. Water management is therefore a vital issue impacting the future of the country and the entire region. Without proper management, Israel's residents could be placed in serious danger even in the near future.

Ten steps are required towards an integrated national policy:

Step 1: Preparation of an environmentally sound Master Plan for Israel's Water and Wastewater

According to Agenda 21, a master plan should be completed as soon as possible, which will address water supply and demand and protect regional watersheds from both a comprehensive and a particular viewpoint. Implementation of the plan must be overseen by fully authorized, environmentally committed government authorities.

Step 2: Creation of a politically independent National Water Authority, centralization of authority and pooling of resources

Balancing the water economy and implementing policy require a strong central authority and management of budgets under an independent body, which will not be subordinate to any given governmental ministry, or subject to partisan political pressure. The Authority needs to act without conflict of interests, with the sole priority of ensuring a balanced and sustainable water management strategy for all the citizens of Israel.

Step 3: Ending pollution and reclamation of water sources and ground

All existing measures must be enforced and implemented to identify and curtail all current sources of pollution, and to plan and carry out the rehabilitation of polluted soil and wells.

Step 4: Guaranteeing water quality in Israel, according to internationally accepted standards

Israeli water standards must be upgraded to those of the WHO. Existing regulations regarding the quality of drinking water supplied to citizens must be implemented and enforced. A permanent monitoring and testing system must be established, allowing for online access to drinking water data and recently approved regulations regarding publication of water quality must be implemented consistently and unambiguously.

Step 5: Internalization of external environmental costs in water pricing

The price of water in Israel does not reflect the external costs of environmental damage, or of damage to water sources, as a result of excess–pumping, salinization, and pollution. These external costs must be "internalized" into the price of water, so that it reflects real price. In addition, price mechanisms must be used to regulate demand.

Step 6: Efficiency and Conservation

The government must lead the way in adopting more efficient water–saving practices within its own institutions to set an example. It should subsidize water saving and environmentally–friendly technologies, and enhance enforcement of various water–saving regulations, as well as invest in educating citizens and various sectors of the economy towards greater awareness. Israel has tremendous knowledge and experience in developing efficient water systems. Prudent exploitation of these systems and efficient management in local authorities can make a great contribution to improving efficiency.

Step 7: Agriculture—preventing soil degradation and establishing standards for effluent irrigation

The water crisis is just one of several crises that Israel's agricultural sector has had to confront. In the past, agriculture was subsidized through lower water prices. As a result of the water crisis, agriculture has been forced to relinquish about half of its water allocations. In 2001 the agricultural sector consumed 43% of all potable water (400 MCM), and received another 1/3 from treated effluents. Half of the 0.4 million hectares of land cultivated in Israel is irrigated. The irrigation uses water conserving technology as drip irrigation or sprinklers. Agriculture has a critical role in the conservation of

open spaces which, among other ecological services, provide percolating surfaces for groundwater, and emergency reservoirs. Tougher regulations for irrigation from treated effluents must be promulgated based on broader environmental criteria than the public health approach that has dominated at present. This is critical to the prevention of additional salinization of lands, nitrates in groundwater and pollution of groundwater. Similarly, regulations need to be drafted to prevent pollution from general agricultural activity.

Step 8: Augmenting water supply and prevention of water losses

New additional water amounts manufactures for increasing supply must be developed and implemented, provided they meet the proper environmental criteria. Given the growing population in the region, desalination is an important part of a future water strategy. A systemic solution for increasing water supply will depend on proper allocation, including reuse of highly treated effluents for agriculture, and for river reclamation, desalination systems and possibly importation. A special emphasis must be made to develop efficient and environmental friendly means for preventing water losses. Israel's Law of Planning and Building must be amended so that it includes water conserving planning and construction guidelines for collection of rainwater in public lawns and gardens within municipal level.

Step 9: Guaranteeing water supply for natural ecosystems

It is important that the government endorse a fundamental change in the prioritization of water resources and make a real commitment to the rehabilitation of rivers. Wetlands and streams with flowing water must be treated as endangered natural resources.

Step 10: Improved sewage treatment

Completion of infrastructure for collecting of sewage water in all communities in Israel, especially in Israel's Arab sector and conveying them to upgraded treatment facilities is a threshold environmental requirement that is long overdue. Planning of a nationwide system for the exploitation of treated sewage, while setting standards that will prevent salinization of soil and pollution of groundwater should be a central part of the country's future water supply strategy.

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ENVIRONMENTAL PLANNING AND SUSTAINABLE DEVELOPMENT OF LAND RESOURCES

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The Society for the Protection of Nature in Israel

Main findings and recommendations

The last ten years, which began with the large wave of immigration from the former Soviet Union, have been marked by the vigorous and comprehensive preparation of outline plans at a national and regional level. This is the main step that has been taken by the government to achieve sustainable development targets—and even this is too little, too late. Notwithstanding the supreme importance of planning in Israel, in many cases it remains "on paper" while in practice an anti–environmental reality is forming, contrary to intelligent land use principles.

A number of substantial and systemic problems pose a real threat to the potential implementation of comprehensive planning in Israel, and to the achievement of sustainable development targets: planning institutions' politicized and unbalanced composition; the absence of implements for preserving open spaces; the absence of adequate incentives for urban renewal and development—including integrated transportation and land use planning; continued encouragement of sprawl; inadequate examination of the environmental aspects of planning.

A number of initiatives, originating from the government itself, run contrary to comprehensive planning and remove it of its very substance: government

initiatives opposed to planning (such as the establishment of new towns and villages); local initiatives which exploit the flexibility of the comprehensive plans; and the tendency for planning flexibility. Not only is Israel's planning system not striding ahead towards democratic, environmental and sustainable planning, but it is regressing and turning into a centralized, unbalanced system, closed to the public, and which functions like an operative arm of the body which is at the same time entrepreneur, planner and the point of approval—the government.

Both the planning system and the green organizations deal largely with damage control, whereas instead, the policy required should direct planning and implement it in advance based on comprehensive considerations. In order to change this situation, preparation and updating the comprehensive outline plans should be continued at all levels, and they should be based on an analysis of the ground–level sensitivity, on the need for effective land resource use, and on public participation. A clear preference should be created for development within cities, and for processes of urban renewal and rehabilitation, rather than ground–gorging suburban development. Planning which integrates land use with public transport development should be promoted.

The public's part in the planning process should be substantially increased, and the composition of the planning boards should be changed at all levels so as to include a wider representation of members of the public and independent professionals. There should be an immediate halt to all destructive enterprises initiated by the government in opposition to planning policy and through a flagrant reduction of the public's right to be a party to the process.

Innovative tools should be developed to ensure the preservation of appropriate open spaces, while attending to the rights of the land's owners or leaseholders. The environmental organizations must operate through complete coordination and in coalitions which are as broad–based as possible. The green groups and the government must act vigorously to intensify Israeli environmental awareness.

Background on the last ten years and a description of the current situation

The last ten years, beginning with the large immigration wave from the former Soviet Union, have been marked by the vigorous and comprehensive preparation of outline plans on a national and regional level. The first

integrated National Outline Plan for Development, Preservation and Immigrant Absorption, NOP 31, was prepared in the early nineteen–nineties. At the same time, a broad team of experts prepared the Israeli masterplan for the twenty–first century "Israel 2020," the main principles of which have formed the basis for the National Outline Plan currently in preparation, NOP 35. This decade has seen the preparation, and in some cases even the approval, of regional plans for every region. For some, this was the first regional statutory plan ever.

These processes, outlined in the Ministry of the Environment's Agenda 21 implementation report, are essential and significant in a country as crowded as Israel, and with such a high development rate. On the whole, the comprehensive plans do incorporate the need for effective land resource use, and for the redirection of development to less environmentally sensitive areas. A number of environmental organizations have taken and continue to take part in the design and approval of these plans, out of a recognition of their importance, as will be specified below.

However, despite the supreme importance of comprehensive planning for Israel, it remains in many cases "on paper," while another reality, extremely severe environmentally, is forming on the ground. This reality has absolutely no connection with sustainable development and effective land resource usage. A number of processes and initiatives pose a real threat to the capability of implementing comprehensive planning in Israel:

- Government anti–planning initiatives.
- Local initiatives which exploit the flexibility of the comprehensive plans.
- The trend for planning flexibility.

A number of other problems preventing the possibility of reaching sustainable development targets are:

- Absence of sufficient incentive for development and renewal within existing cities, including integrated land use and transportation planning; continued encouragement of suburban sprawl.
- Inadequate examination of the environmental aspects of planning.
- Political and unbalanced composition of the planning institutions.
- Absence of tools for preserving open spaces.

The following is a short outline of the aforementioned problems.

Government anti–planning initiatives

Since the early nineties, alongside the absorption of the large wave of immigration, the government has begun to promote rapid planning processes, dissociated from and contradictory to the national outline plans, with dire environmental consequences. The first of these initiatives was the establishment of special committees for dealing with dwellings and employment—Councils for Building Dwellings, which hastily approved many plans, disregarding national planning trends. These plans gnawed away at open spaces, without appropriate sewage, transportation solutions and social services infrastructures, and involved land–gouging construction. Since then the government has initiated on a number of occasions moves to speed up the planning processes. Thus far, all of these moves have been blocked by broad public opposition.

The government recently initiated a similar move to speed up planning processes via the Budget Economic Arrangements Bill. The bill includes the formulation of a special committee to approve large scale projects, specifically infrastructure facilities, those inflicting the most severe environmental impacts. The committee consists of a small number of members with government representatives constituting an absolute majority. The proposed process allows for incomplete examination of environmental aspects, and the public's already small capacity to influence the project or oppose it is reduced to a minimum. The proposal has not been advanced through the regular legislation proposal process, so that its promotion is essentially political and has not been professionally examined.

At the same time, the government is initiating the establishment of new towns, villages and cities. The beginning of the decade saw the establishment of a number of new settlements through a security–oriented settlement doctrine. Some of these towns now form satellite suburbs for the cities of the Dan Block metropolis (the greater Tel–Aviv metropolitan area), along with the accompanying transportation issues. They are characterized by wasteful and land–greedy construction. The initiative to set up new towns has recently been energetically renewed, and a number of government ministries are initiating plans for dozens of new towns throughout the country. Nearly all of these new plans are proposed for highly environmentally sensitive areas. These initiatives ignore the need to strengthen existing towns and cities; they intensify the already severe state of dispersed, land–gorging construction; they prevent the realization of the goal

of redirecting most of the development to existing cities; and they create a necessity for the laying of new infrastructure, particularly roads. Furthermore, they prevent any potential to strengthen weak communities in existing towns. The main motive behind these plans is politics, not planning, certainly not environmental planning and definitely not sustainable planning.

The Israel Land Administration (ILA) has made a number of decisions in recent years which clearly encourage a change in land zoning from agriculture to development. These decisions fundamentally alter the policy of preserving agricultural land, which had been zealously guarded until the early nineties. They also spawned a host of initiatives to clear agricultural land for construction. Since the ILA administers over 90% of state land, its change in policy is incomparably severe. Just at a time when the need to defend agricultural land is so acute, due to the development boom and the absorption of the immigration waves, this organization should have made a clear statement concerning the importance of conserving open space.

The realization of these initiatives will put to rest any ability for Israel to implement planning goals based on principles such as concentration in built–up areas and directing development to less sensitive areas. These initiatives remove all substance from the national planning policy, which the government has declared itself a party to, and turns the Israeli planning system into a centralized, unbalanced set–up, closed to the public, and functioning as the operational arm of the same body which initiates, plans and approves—the government. This planning system will become an instrument for a politicized demographic outlook rather than a planning–based, social and environmental one.

Local initiatives which exploit the overall planning flexibility

Although Israel has a hierarchical planning system, in which the desired policy is supposed to be dictated at each level from top to bottom, in actual fact many initiatives are advanced from the bottom up, with massive pressure applied for exemptions from approved plans.

A large portion of these initiatives originate with organizations which are supposed to be entrusted with maintaining the national planning goals—the ILA and local municipal authorities. However, the latter act in every way like private entrepreneurs, promoting isolated plans, which contradict the desired planning policy by exploiting flexibility and loopholes in planning regulations. Outstanding examples exist along the coastline—enormous projects promoted, and in some cases approved and erected, in complete contravention of the National Outline Plan for the Coast. In sum, these

initiatives remove all substance from the comprehensive plan, which in the end becomes no more than a basis for alterations.

Flexible tendencies in planning

The new, inchoate Outline Plans, primarily NOP 35, adopt ambiguous planning language and are open to wide–ranging interpretations. The source of this tendency is the desire to transfer the conflicts inherent in the process to the later, more specific planning stages, by refraining from making clear statements. This state of obtuseness and lack of clarity in the end serve the interests of development and enterprise, more than those of conservation and balance.

A number of other cardinal problems prevent intelligent planning from being realized, and sustainable development targets from being met:

- The absence of adequate incentive for development and renewal within urban boundaries on the one hand, alongside continued encouragement of sprawl on the other: Israel's conventional policy gives priority to ground–level suburban development over development and restoration within cities. This is owing to the relative ease with which open spaces can be freed for construction, the non–granting of urban renewal incentives, and an absence of coordinated development of land use and transit.

Insufficient examination of environmental aspects of planning: The main legally–mandated tool, the environmental impact assessment (EIA), does not actually contribute to the redirection of development to less environmentally sensitive areas, but acts merely as a justification for the site requested by the developer—who finances the survey. In most plans, at all levels, the environmental information is still not a main basis for planning. Other considerations—demographic, political, property—largely dictate land use.

Political and non–balanced composition of planning institutions: Independent professionals and public representatives make up an extremely small portion of the planning institutions. In some committees, the power relationships are such that the considerations weighed when approving a plan are neither sufficiently professional or environmental, but are governed by political factors. Government representatives form a large portion of the National Planning Committee, preventing an independent examination of plans in certain cases.

Absence of tools for preserving open spaces: Open spaces in Israel are mainly preserved via the national outline plans. Relatively smaller open spaces are protected by the direct legislation of the National Parks and Nature Reserves Law, and the Forest Ordinance. Other tools for preserving open spaces are notably absent in Israel, especially when seen against the need to cope with the rights of private owners and leaseholders on the land designated for conservation. To our distress, substantial portions of land that should be designated for conservation are not protected with this status, owing to the absence of procedures for dealing with the landowners' rights. As a result, land use is dictated by property considerations rather than by an environmental–planning rationale. Tools that could alleviate this problem (such as purchasing the land and transferring it to public ownership, purchasing or transferring development rights) are practiced in other western countries and should be adopted in Israel too.

The Government's essential undertakings according to Agenda 21:

Consolidating a policy of optimal and sustainable land resource use and management, addressing particular attention to the issue of agricultural land.

Encouraging a policy of sustainable development of land resources, while also dealing with the interests of local communities.

Reinforcing the planning system by updating national outline plans, preparing plans with integrative treatment of all natural resources—water, air, land, ecosystems and so on.

Advancing the implementation of innovative tools for land planning and management—tools for evaluating environmental sensitivity, including risk surveys, absorbing the value of environmental resources into national cost analyses and so on.

Educating towards awareness of the significance of the land resource and its efficient management, emphasizing the place of the individual and the group in affecting the achievement of these goals.

Public participation in planning processes by means of innovative methods, operating programs and projects, and designating resources to the issue. Particular stress is to be devoted to groups who are normally excluded from the process—women, young people, various local groups.

Creating a broad and up–to–date information base on environmental issues that will form the basis for environmental planning. This is to take place

both through information and data gathering, and by improving the contacts and flow of information among bodies and institutions so as to enable a common information base to be set up.

Whether and how the government has fulfilled its obligations

Against the background of these criticisms, it is important to note that there were a number of years in the mid–nineteen–nineties when the incumbent government advanced a number of environmental preservation goals. A number of important decisions were made in this period, such as the non–establishment of new towns, protection of the region of the craters (in Hebrew: *makhteshim*) in the Negev desert, the declaration of the preservation of the Sharon Park which laid the way for instituting its preservation status, and so on.

Unfortunately, these significant achievements could be obliterated as a result of a number of subsequent years of flagrantly anti–environmental policy, which has reached its peak over the last year.

The government has largely fulfilled its obligations concerning the advancement of the planning infrastructure through preparation of updated national outline plans. However, the planning violating initiatives recently being promoted by the government, totally obliterate any ability to realize the comprehensive planning policy goals.

Not only has the government not fulfilled its obligations to work towards public participation, education for awareness of land resource significance and scarcity, and creation of a broad environmental basis for planning, but it has also consistently issued contrary messages. These have appeared through a series of its decisions and actions which view land solely for its development potential, a tool for realizing the government's outlook on different issues, and which reduce public involvement in planning processes.

Over all these years, the government has not come out with even one declaration of the importance of conserving land resources, but instead has produced series of decisions encouraging the freeing–up of land for development. From many perspectives, the government has not only failed over the last decade to advance towards the aforementioned goals, but it has regressed the land management and planning system considerably.

The environmental non–government organizations' (NGOs) actions on the issue

The number of environmental and social welfare organizations active in Israel has risen substantially over the last decade. Many of these have arisen out of local campaigns. Similarly, a number of social welfare organizations have taken up issues of environmental justice, mainly as a result of various aspects associated with land resource management.

The massive development boom which has taken place in Israel over the last decade has required, and continues to require, the environmental NGOs to take every step and measure necessary to minimize the environmental damage caused by this wave of development. This task is particularly difficult against the background of the large development needs. The following is a general survey of the main modes of action taken:

- Participation in planning processes: A number of environmental NGOs, led by the Society for the Protection of Nature in Israel (SPNI**)**, have taken part in the national and regional planning processes. This has taken the form of conferral of professional material (such as nature and landscape surveys so that they can form part of the planning data), active participation in steering committee meetings and other planning committees in order to instill the environmental issues into planning directives, submission of legally mandated objections, public and media activity, consolidating environmental alternatives, working in coalitions with other organizations—information exchange, and so on.

- Fighting anti–planning initiatives: An uncompromising campaign has been waged throughout the years against every government initiative inconsistent with the national planning goals and which harms the public's rights. This campaign has taken place through the media, professional conferences, public activism such as demonstrations, and so on.

- Public activism: Ongoing action in the communities, particularly urban ones, towards attaining sustainable development goals, and rallying to individual campaigns where needed.

- Education and developing awareness: Broad–based environmental education activity in schools, work with local communities, operating environmental specialization programs for planning and architecture students, holding study days and seminars for planners and decision–makers.

- Professional work: Preparing nature and landscape surveys, initiated alternative planning and consolidation of environmental alternatives to harmful projects, carrying out studies on environmental issues by gathering information and learning from other countries. Distributing the information amongst decision–makers, planners and the wider public.

- Legal activity: Approaching the courts on issues relating to actions contrary to planning policy, where pretext exists. A number of legal battles have ended by setting environmentally oriented precedents and legal rulings. The leading organization in this field is the Israel Union for Environmental Defense, but other NGOs are also making more and more use of the judicial tool.

Recommendations for change

The government, and all its departments, must continue to advance the preparation and updating of comprehensive outline plans on a national, regional and local level.

These planning processes should be based on a sensitivity analysis of the area, on the need for efficient and correct use of land resources, and on public participation.

The role of the environmental examination in the planning process should be strengthened so that an area's environmental sensitivity forms a necessary and obligatory basis for planning.

A change should be made to the Planning and Building Law, so as to increase substantially the public's place in the planning process, as against the miserable current state of affairs.

Composition of the planning boards should be altered at all levels so as to include a wider representation of the public and of independent professionals.

A clear government statement is required, covering all its departments, concerning the importance of the conservation of open spaces. This declaration should be instituted in both legislation and through the policy of the Israel Land Administration, which currently represents an opposing approach.

A stop must be made, immediately, to the government's constantly renewed, destructive initiatives to speed up planning and construction processes and to erect new settlements contrary to planning policy and through a flagrant reduction of the public's right to participate in the process.

Clear priority should be given to development within cities and to processes of urban rehabilitation and renewal, ahead of land–devouring suburban development.

Agricultural land is the "soft underbelly" of the various kinds of open space in Israel. These are large areas (around half of all the open space north of Beersheva), which are under–protected in the plans, some are no longer cultivated due to the water shortage, and they are under large pressure for rezoning owing to the low returns from agriculture. Priority and efforts should be directed to preserving agricultural land, whether as cultivated areas or as another kind of open landscape.

Planning should be promoted which incorporates land use zoning with transit development.

Appropriate innovative tools should be developed in order to enable the preservation of open spaces to be solidified while responding to the rights of landowners or leaseholders. The environmental organizations have recently begun a research initiative on the issue, but that is insufficient. Suitable resources must be allocated to this process, since some cases involve compensation and the purchasing of property rights.

The environmental organizations must work in full coordination, constantly updating and exchanging information on different issues, out of an intention to operate in the broadest possible coalitions. Coordinated operation will enable response to numerous environmental issues, while allowing each organization to focus and increase its professionalism. In light of the environmental state of emergency in Israel, the environmental movement must join forces and gather as much strength as possible.

Government and environmental NGOs must work to deepen Israeli environmental awareness through the formal and informal education systems, higher education and modes of informing the public at large.

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THE MEDITERRANEAN COAST

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Introduction

This chapter discusses Israel's Mediterranean coastal strip, which extends for 190 km and is subject to intense competition over land use as well as massive development pressures. The decade that has passed since the Rio convention in 1992 has been perhaps the most strenuous for Israel's Mediterranean coast. During this period, and especially at its outset, an unprecedented surge in development began along the coast. This accelerated development was as far removed from the notion of sustainable development as could be imagined. In the last few years, in the wake of a far–reaching public and legal campaign led by the environmental organizations and the Environment Ministry against these trends, a transformation can be discerned in the attitude of the decision–makers and the public towards coastal development. However, there is still a significant gap between recent declarations about a progressive approach to coastal development and reality, which shows little proof of progress in anchoring these intentions in statutory or legally binding instruments.

Changing the current situation and reversing the anticipated trends will demand simultaneous action along a number of lines: protective legislation;

increased enforcement; and application of the established policy in relation to Israel's coastal stretch.

Description of the current situation

This document relates solely to the coastal region. Since the accumulation of pressures on the coast has increased substantially in the past decade, activists' efforts have naturally been geared mostly toward this sphere. The sea region, on the other hand, although it too is threatened, has experienced a general tendency towards improvement in the past years.

When one considers the existing condition of Israel's Mediterranean coastal stretch, the need to apply the concept of sustainable development gains increased validity. This coast extends for only 190 km, and one–quarter of it is already occupied by infrastructure and military facilities, and is hence closed to the public. The remaining 150 km is subject to intense competition over different land–uses, and subsequently the stress on this coastal region is extreme. The extent of development planned along the coast is expected to increase: another 40 km of coastal stretch is designated for building; six additional marinas are at various stages of planning; a long line of planned resort villages threaten the continuity of open spaces along the coast; and large–scale infrastructure projects are in the planning process—including desalination plants, a power station, a marine network for the transportation and supply of gas, and the construction of an artificial island as an airport. The ever–increasing pressure on the coastal strip is largely tied to the rise in population, as evidenced by calculations which show that today only 2.5 cm of coastal strip per resident remain, as opposed to 31 cm of strip per resident 50 years ago, at the time of the State's establishment.

The current picture points to the discrepancy between the progressive–sounding declarations relating to the coastal strip, and the fact that no binding legal or statutory ground for such declarations exists, as will be outlined below. The principles of sustainable development along the coast are advocated across almost every platform, and yet the planning institutions and governmental authorities continue to promote and to approve plans that contradict these very principles. Among the primary reasons for this is the fact that the coastal strip is viewed by various agents (the government among them) primarily as an economic resource, and not as a natural and public resource.

In one of the decisions given this past year, the Israeli Supreme Court addressed the state of Israel's shores, in a statement which accurately reflects reality: "We have only to add that in our present situation the

question of coastal preservation and access to the shoreline gains increased importance in light of the need to preserve what little is left of the nation's coasts, which have quickly become a scarce and over–exploited resource, and not always for the benefit of the general public."

Nevertheless, the current situation also indicates that the trends of intensified and unchecked development that characterized the early 1990s, and which will be delineated further on, have been considerably curbed. At the same time, planning for most of the coastal territory has been revised in ways that embrace both the positive and negative possibilities of development.

Background on the past ten years

Today, the primary means for protecting the coasts is through the National Outline Plan for the Mediterranean Coasts (NOP 13), which designates land–uses, and specifies what is allowed or prohibited along the coastal strip. This plan, which was approved 20 years ago, embodies a correct approach to development.

Attempts on behalf of the Environment Ministry during the 1990s to update the plan (NPP 13C) and to bolster its environmental underpinnings did not succeed and were not fulfilled, so that this plan, which had already come a long way, is now slowly receding into oblivion. Its potential contribution currently receives only indirect expression, primarily among those who were responsible for drafting it.

A policy document regarding Israel's coastal waters was prepared towards the end of the 1990s and approved in 1999 by the National Council for Planning and Building—Israel's uppermost planning institution. The policy document, which was prepared by a broad interdisciplinary committee of experts and coordinated by the Ministry of the Interior, undoubtedly represents a step forward in respect to the treatment of the coast as a natural and public resource. The document speaks in favor of integrated management for sustainable development and details the necessary action in each and every field. It defines a long list of principles whose application will allow development alongside preservation of both natural resources as well as the public's rights to the coast.

However, and this is the central point, this document lacks any kind of statutory, legal or binding authority, and therefore the true test is in the application of its recommendations. In actuality, very few of the recom-

mendations have received any kind of attention at all and even fewer have been realized or put into action.

In order to substantiate the change in approach towards the coastal territory and in order to strengthen protection of the coast from heavy development pressures, the Environment Ministry has drafted a bill for the "Protection of the Coastal Environment." This proposal, however, has been shuttled from one government office to another for three years now, and at present no end can be seen to this deferment. The result is the discrepancy mentioned earlier between theory and practice.

Examining the current state of affairs allows for a rough division of the decade since the Rio convention into two periods. The first half of the decade was characterized by extremely accelerated development along the coastal line which bore no resemblance to principles of sustainable development, social justice, preservation of natural and landscape values, and so on. There was one catalyst for this accelerated development—real estate. The rising land value of the coastal strip, along with rapid growth, led to heavy strains on the coastal region. Examples are numerous, and we will highlight the foremost among them:

Development of new marinas, e.g. the Herzliya Marina: At the outset of the 1990s there began a wave of marina developments that were ostensibly a response to demand for anchoring sites, and designed to serve as tourist attractions. However, upon closer scrutiny, the case of the Herzliya marina shows that the occupancy of anchoring spots is less than 50% and that all the hotels planned in the project were transformed during the promotion period into private holiday apartments for the wealthy. This state of affairs, typical of other marinas as well, suggests that the true reasons for the development of the marinas were not those declared at the outset but rather the opportunity that "arose" for developers to sell luxury apartments on the coastline. In addition, the project was executed by private entrepreneurs who built the public infrastructure in exchange for dried land for marketing. This system, in which the state is involved only in the planning stages, led to a series of violations whose motivation was to increase the developers' profits at the expense of the public good, and in some of the cases legal proceedings are pending.

Herzliya Marina

Housing development in the guise of tourist development, e.g. the Carmel Beach Towers: The phenomenon of housing development disguised as tourism projects, evident in the previous example as well, proceeded throughout the 1990s along the entire coastline in a series of projects. The most outstanding project, in several respects, is the Carmel Beach Towers in Haifa. This development was built on the Haifa coastline on land that was designated in NOP 13 for hotels and recreation. In reality, when the project entered the marketing stage, it was revealed that the hotel units were being sold as holiday apartments for private residency. When it became evident that the government bodies with a hand in the matter, such as the Ministry of the Interior, the Ministry of Tourism, the Israel Land Authority and the local authorities were keeping silent, a petition was filed at the Supreme Court by the environmental organizations. This petition was recently heard

by the Court, which judged that one of the goals of NOP 13 had been to prevent private residency along the coast. Consequently, all further marketing for such purposes was prohibited. Legal decisions in a similar spirit had already been given in preceding years, but not in such a high–level court.

Carmel Beach Towers

Destruction of the coast and cliffs, e.g. the Ashkelon beaches: Because coastal currents traveling from south to north are the primary source of sand replenishing Israel's beaches, every marine construction creates an obstruction to this flow of sand. The largest such constructions erected in the last decade are the three marinas in the cities of Herzliya, Ashkelon, and Ashdod. Although the complex modeling that was used during the planning stages of the Ashkelon marina predicted that damage to the coast would be minimal, in reality the coastal strip to the north of the marina has diminished by more than 50%, and the cliffs along the coast are deteriorating. This coastal strip lies in the 'shadow' of the marina and the supply of sand to it has therefore almost completely ceased. As a result, the coastal strip has narrowed and protection of the cliffs has been impaired, causing accelerated deterioration of the cliffs. Attempts to obligate the local authorities or the developers to restore the damage have been fruitless.

Fencing of the coast and obstruction of free passage, e.g. the Nitzanim Beach: Despite the fact that the right to free passage along the coast is mentioned in several documents, in reality one finds a trend of beaches being closed off for events. This is in addition to those already closed for security or military purposes. Nitzanim Beach, for example, one of the most popular open beaches in Israel, has transformed in the past two years into a giant event park in which sections of the beach are closed off to the general public during private functions of different kinds (weddings, trade union gatherings, parties, etc.). This phenomenon of appropriation of the coast by developers has not met with any opposition from state authorities.

Automobile use on the coast: With the rise in standard of living and the increase of off–road vehicles in Israel, the trend of driving cars along the beach has become a national scourge, and a source of injury to both the bathers and the natural coastal territory. In 1997, the Israeli government approved a bill to prohibit automobile use on the coast. However, to date the local authorities have not taken the trouble to enforce the law. In response to a petition filed by a private lawyer, a number of measures were taken, but with the withdrawal of the petition matters reverted to their previous state and the off–road vehicles continue to destroy the coast.

Protection of the natural value of the coast: The most effective protection of the coastal environment is achieved by formally declaring the area a nature reserve. In reality, although 20 reserves along 42 kilometers of beach have been defined by the Nature and Parks Authority as worthy of protection and were nominated as nature reserves, only six kilometers have been declared. The state of marine reserves is even more severe. The primary reason for this is the refusal of local and state authorities to declare territories in their jurisdiction as nature reserves.

Nevertheless, in the second half of the last decade and over the past few years, there has been a certain change in attitude and awareness in relation to the coastal environment. The drive for development depicted above has for the most part been curbed, and the position of decision–makers and the public in relation to the coast has begun to undergo a process of transformation. Of late, it is possible to recognize this progress among professionals at the highest echelons. It is difficult to say the same for decision–makers on the local level, or even on the political level. The primary reasons for this change can be traced to a number of factors that collectively contributed to it: the negative impression created by the projects built along the coast, the persistent campaign against them led by the environmental organizations, and the enlistment of the Environment Ministry in this campaign.

Has the government fulfilled its obligations, and if so, how?

As a signatory to Agenda 21, the Israeli government has committed itself to a plan of integrated and sustainable management of the coastal area, both on the level of policy and on the level of implementation. The immediate outcome was to be the creation of a designated body or authority to enforce the policy on the local and national levels.

On the national level, the statutory basis provided by NOP 13 at the beginning of the 1980s was expanded at the end of the 1990s into an inclusive and wide–ranging policy regarding the coastal complex. The policy document regarding Israel's coastal territory was drafted primarily by state authorities, and clearly reflects an overall sustainable vision of coastal protection and development, even in relation to the policy guidelines set out in Agenda 21.

However, to a large extent this policy document arrived too late—after many new realities had already materialized "on the ground." More importantly, it has no statutory or legal standing that might affect future development.

The Israeli government did not act upon Agenda 21's recommendation to create the necessary apparatus for integrated and sustainable coastal management, either at the national level and certainly not at the local level. Nor does government policy anywhere reflect a key topic emphasized in Agenda 21—education—in particular, education for the sustainable development of coasts.

In actual fact, the national authorities were not capable of resisting the extreme pressures from developers, who succeeded in advancing their own interests. They did this, on the one hand, by taking advantage of gaps and oversights in the NOP 13 and, on the other hand, because of lack of scrutiny and enforcement on the part of the government. This incompetence in protecting the country's coastal resource is expressed in the State Comptroller's Report No. 49 (1998), which stated that the program: "established principles for development of the coast and for the creation of tourism and recreation centers for the general public, alongside assurances of the protection of the coast's natural resources. It was found that the program failed in protecting these resources."

Not only did the relevant government ministries fold under the development pressures they faced, they also failed to recognize the focal problems in time and to take action accordingly. The planning institutions and the government agencies are in fact responsible for neutralizing the National Outline Plan for Coasts, by allowing developers and local authorities to bypass it, thereby voiding it of content and lending a hand to the unbridled and destructive development along the coast. The government authorities were

not vigilant about enforcing the law, nor did they outline and implement a policy that would protect the public's rights on the coast or the coast's natural resources, as the examples in the previous section have clearly demonstrated.

Only in the past few years, as described above, is it possible to point to some kind of progress. This progress is most evident in the Environment Ministry, which has harnessed itself to the campaign begun by the environmental organizations. Certain progress, although less dramatic, can be discerned within the Ministry of the Interior, which has begun to understand the need for controlled development of this limited and essential resource: the coast.

What have the environmental organizations done?

In the mid–1990s, Israel's environmental organizations recognized the trends and threats overshadowing Israel's Mediterranean coasts as a result of accelerated development. The response to this was a concentration of effort in the realm of planning and construction by means of wide–ranging activity, consisting primarily of:

- Public campaigns against projects which were in the process of construction along the coast. These campaigns succeeded in undermining the projects on the one hand, and in increasing public awareness of the problem on the other.

- Legal campaigns against a series of projects along the coast, which were built for private residences, although they were originally intended for tourism. These campaigns led to a series of important rulings in the courts, which accepted the petitions and spoke out against the infringement of the public's rights to the coast.

- Far–reaching planning activity, which led to a high level of specialization. This allowed for successful deliberation in the planning institutions and led to the rejection of certain plans.

- Generation of professional reports and opinion documents that were acknowledged by decision–makers and contributed to a change in position, of both the decision–makers and of the general public.

Parallel to the various channels of activity, wide–ranging public and media activity was undertaken year–round by the environmental organizations,

preventing the issue from disappearing from the public agenda, and allowing it to penetrate the public's awareness and bring about change.

In addition to local campaigns, the environmental organizations are privately advancing a bill in the Knesset (parliament) for the protection of the Mediterranean coast, by means of a coalition of 20 organizations called the Coastal Organization Forum. The bill deals with a long series of issues and is based on the need for sustainable development along the coast, and the protection of public rights. The bill has passed a preliminary reading in the Knesset, and is in preparation for a first reading.

Recommendations for change

- Change in the current situation can be brought about in the long term by means of education that will engender a significant change in attitudes. However, the complex of pressures threatening the Mediterranean coasts also demands an immediate response. The most rapid and most significant change can be achieved by means of clear, comprehensive and effective legislation, which will be readily enforced. This would follow in the footsteps of many countries that are endowed with a much longer coastline than Israel, but have still found reason to legislate laws to protect their coasts. It is therefore essential that the government recognize the urgency of this legislation. Only recognition of this type will prevent the government from placing obstacles in the way of policy implementation, and will allow it to resist the pressures of economic players and of local governments.

- Change can also be brought about by means of increased enforcement. In recent years, the environmental organizations have filled the void in this area and have often pursued legal avenues of action. But the correct and appropriate way is for the government bodies responsible for enforcement to faithfully carry out their job, even if it means changing priorities and investing resources.

- Implementation of the Coastal Policy Document for Israel, in which tremendous effort was invested. The document was adopted by the National Committee for Planning and Building, and all that remains now is to carry out its recommendations. The government can call for implementation of the policy at different levels and can actively work to this end.

- It is useful to expose decision–makers to action that has been taken around the world in relation to coastal issues. The abundant and wide–

ranging activity of Western countries can directly or indirectly influence Israel's decision–makers.

- The proposal to establish a coastal and river authority, which is currently being kicked about in the Environment Ministry, should be considered. However, it is feared that the establishment of a limited authority without all the requisite capacities, which are currently dispersed, is likely to complicate the system even further, and to come at the expense of other objectives, such as the promotion of the coastal legislation.

- It is necessary to consolidate and strengthen the authority of the Environment Ministry so that it can operate more effectively, both on the level of integrating principles of sustainable coastal development, and on the level of enforcement and administration of penalties.

ENVIRONMENTALLY SOUND MANAGEMENT OF SOLID WASTE

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Introduction

This chapter discusses most sources of solid waste: household waste, municipal solid waste, commercial and industrial waste, agricultural and hazardous waste, and examines the degree to which Israel has progressed in the area of solid waste management from 1992 till the present. To an extent, it also considers plans for the future. While this document includes a critique of the Ministry of the Environment's activity, the major source of data and analysis on the subject is the ministry's own Solid Waste Division.

Summary

According to figures from the Ministry of the Environment and the Central Bureau of Statistics, Israel produces 4,818,000 tons of municipal solid waste (in 1998). This includes domestic waste, yard trimmings, and commercial and industrial waste (excluding construction waste). In addition, Israel produces 2 to 6 million tons of construction waste, 300,000 tons of agricultural waste (not including biodegradable organic waste), 3 million tons of animal excrement, 1 million tons of produce which is destroyed, 500,000 tons of wastewater sludge, 500,000 tons of contaminated soil, and more than 200,000 tons of hazardous waste.

The yearly rate of increase of solid waste in Israel is 5%, while the growth rate of the population is only 2% a year (Toward Sustainable Development 1998). For example, in 1998, each resident produced 2.2 kg of waste, representing an increase of 83% from the 1.2 kg of waste produced in 1972.

Solid waste management in Israel underwent a radical change during the 1990s, after the closure of scores of unlined garbage dumps. By the end of the 1990s, several regulated landfills designed for collection and treatment of leachate and biogas were in operation. Despite the apparent progress, solid waste management in Israel is in crisis, and lacks sufficiently advanced, environmentally sound planning solutions for both the short and long terms.

Local government authorities are responsible for treatment of solid waste in Israel, whereas the role of the Ministry of the Environment is in formulating policy and enforcing the laws relating to waste management. Over the last decade, the Ministry has failed to draw up a detailed master plan with policy guidelines, targets, budgets and methods of waste treatment. In the absence of such a plan, any attempts at creating the appropriate infrastructure for phasing in advanced waste management solutions meets with serious difficulties. Given this state of affairs, local authorities ultimately dictate waste management policy, more often than not seeking the cheapest solutions, and, lacking adequate guidelines and assistance, turning to landfill disposal, including unregulated dumps, as a solution.

According to the Ministry of the Environment's most recent data, 14% of municipal waste (by weight) is recycled, and the rest is sent to landfills. 35% of municipal waste is transferred to unlined waste dumps, without any facilities for collection and treatment of leachate and biogas. In 1993, the Collection and Transfer of Waste for Recycling Law was passed; regulations adopted in 1998 required local authorities to meet recycling targets of 10% by 2000, 15% by 2001, and 25% by 2007. Despite the modesty of these targets relative to European or North American standards, nearly all local authorities evade this requirement. The reasons for this are the extremely low costs of landfilling, minimal enforcement, and a lack of infrastructure. Environmentally sound alternatives to landfill disposal have not developed in Israel, with the exception of three Material Recovery Facilities (MRF), the recycling of approximately 30% of paper and cardboard, and a few compost facilities for trimmings and organic agricultural wastes.

International commitments

The **UN Framework Convention on Climate Change (1992)** defines Israel as a developing country, obligated merely to inventory sources of greenhouse gas emissions within its territory, with a general commitment to prevention of climate change. Agenda 21 sets forth a number of solid waste–related objectives:

Reduction of waste, including the creation of a mechanism for monitoring changes in the amounts and composition of the waste. Developing countries were expected to stabilize waste generation, without curtailing economic growth, by the year 2000. All countries are required to draw up plans for reduction of agrochemical waste and hazardous packaging materials.

Maximum reuse and recycling, while exploiting technologies with a reduced environmental impact. Public awareness campaigns and public participation are integral to this activity, as well as the identification and development of markets for recovered materials.

Promotion of environmentally sound techniques for the disposal and treatment of waste.

Expansion of existing collection and disposal systems that meet minimal sanitation requirements, to prevent the outbreak of epidemics and environmental damage among all population sectors.

The ongoing dominance of landfill disposal in Israel

Waste management in Israel operates according to the National Outline Plan for Waste Disposal, drawn up in 1973–1974. At that time, landfilling was regarded as the only option for waste disposal. Although the plan has since been updated with new landfill sites added, a new detailed plan has not been drawn up answering current needs and based on contemporary knowledge about advanced technologies appropriate to Israel.

During the past decade Israel has relied on landfills as a central solution for solid waste management. The Ministry of the Environment's data reveals that the amount of waste not designated for landfill disposal has risen by 10% over the last decade (from 3% to 14%), and if pre–consumer recycling is counted, the rate of recycling reaches 20%. The rest of the waste goes to landfills, with 35% of the landfilled waste still ending up in unlined dumps.

Over the past decade, the Ministry of the Environment has made a concerted effort to close down most of the illegal waste dumps, and has

concentrated landfilling in a limited number of sites. Currently, 10 central landfills are in operation, as well as 3 material recovery facilities and several local landfills in the Negev. The landfills currently in operation include unlined waste dumps, lacking in infrastructure for the collection and treatment of leachate and biogas, where waste is merely buried and covered by earth. This method still accounts for around 35% of all waste. Almost 20% of waste buried in this manner is located in areas of high hydrological sensitivity, at a time when Israel is suffering a severe water crisis.

The Ministry of the Environment and the Ministry of the Interior declared that they would shut down three of the five remaining illegal landfills by the end of 2001. In fact, only one, which received 1,000 of the 5,000 tons transported daily to illegal landfills, was shut down according to schedule. Again, the local authorities' failure to comply with the law is at the root of the problem. This failure is serious, since most of the waste could have been disposed of by now at modern landfills, thus reducing environmental damage. To facilitate the transition to modern landfill disposal, the Ministry of the Environment has subsidized the difference in price between modern landfill disposal and disposing of solid waste in unlined dumps, reducing the subsidy by 20% per year over a five–year period.

State subsidization of landfill disposal

In Israel, landfills enjoy state subsidies, since no payments are required for the land they use, or for the future limitations on land use many decades after their closure. Many landfills operate without a license, or abuse their license by expanding beyond their limits to accommodate larger quantities of waste. At older landfills, operators in some instances have upgraded sections or "cells," leaving older cells without infrastructure for reducing pollution.

Landfill operators are presently not required to obtain insurance against short– and long–term environmental risks associated with landfill operation. Landfills continue to pose a severe environmental threat for decades after they are shut down, but no guidelines exist for local authorities as to the appropriate procedures for future treatment and monitoring of sites post–closure. New landfills are most likely to be opened in the southern part of the country where, because of the arid conditions, organic matter decomposes slowly. As a result, these landfills present an environmental threat over a longer period of time, requiring monitoring and treatment for many decades. It goes without saying that few local authorities wish to take on such extended responsibility. Clearly, part of the reason that landfills in

Israel are so inexpensive is that long–term consequences are not taken into account.

Changing market conditions

To enable diversion of waste from landfills to more environmentally sound solutions, such as reduction, re–use, and recycling, the latter must become economically competitive. Landfill disposal in Israel is very inexpensive, costing between $8–$12.50 per ton (exclusive of transport).

Since environmental externalities are not internalized, prices are distorted, creating incentives for harmful practices. The Ministry of the Environment has attempted—to date unsuccessfully—to correct this market failure by promoting a fee, which internalizes some of the external costs of landfilling (pollution of air, soil, water, health costs, land use, and others). These parameters do not include constraints on future land use, or the economic costs of long–term environmental risks (estimated at $5–$10 per ton of landfill waste). Integrating these parameters will improve the economic logic of the landfill fee, whose primary purpose is to establish a clear policy for shifting the solid waste burden from landfills to more environmentally sound technologies.

The European Union has taken an unequivocal position, declaring via EU Directive that landfill disposal is an environmentally destructive technology, and establishing that the amount of organic waste going to landfills should be gradually reduced by 75%. While Israel's Environment Ministry has set as its goal the reduction of landfill disposal by 50% by the year 2010, it has declared landfill disposal to be environmentally equivalent to recycling, composting, incineration and anaerobic treatment of solid waste.

Greenhouse gas emissions from landfills

An examination of greenhouse gas sources carried out in 1996 predicted that Israel's landfills would produce 27% of all greenhouse gas emissions generated in Israel over the coming 20 years. Over the next century, these landfills will account for 13% of all greenhouse gas emissions. Landfills rank second only to fossil fuel–burning power plants as a source of greenhouse gas emissions in Israel.

Sector	CO_2 (10^3t/y)	CH_4 (10^3 t/y)	CO_2 equivalent (10^3 t/y)	
			20 years	100 years
Energy	**51,600**		**51,600**	**51,600**
Cement production	**1,700**		**1,700**	**1,700**
Forestry	**– 400**		**– 400**	**– 400**
Agricultural		**42**	**2,400**	**900**
Solid waste disposal		**370**	**20,700**	**7,800**
Wastewater treatment		**10**	**600**	**200**
Total			**76,600**	**61,800**

Table 1. Summary of emissions and removals of carbon dioxide (CO2) and methane (CH4) from different sectors (1996 figures).
Source: Government of Israel: Center for Nuclear Research, Report #2784.

Over the past three years, several landfills, which receive 65% of municipal and other types of solid waste, were established or upgraded to collect and treat biogas and leachate. Current sources of greenhouse gas emissions are: closed dumps or abandoned unrehabilitated cells within operating landfills, modern landfills (where 30% of the gas is not retained in the collection facility), new cells lacking infrastructure for biogas treatment, and active dumps with no infrastructure.

Israel continues to rely on landfilling, and does little to reduce greenhouse gas emissions, apart from changing over to new landfills with biogas treatment facilities. There has been no systematic effort to reduce the amount of organic matter going to landfills, which is the main source of methane and CO_2 emissions. In addition, no national detailed plan or budgetary framework exists to address the problems of data collection and rehabilitation of large abandoned dumps.

Additional air pollutants from landfills

Abandoned, unrehabilitated dumps are a significant potential hazard because, in the past, they accepted various types of waste including hazardous waste and medical waste. Most of the abandoned sites are not monitored, and the rates of their emissions to air, ground and water of various pollutants, including organic and inorganic materials and heavy

metals, are unknown. Several of the sites experience internal burning, but no survey has been conducted to show which sites are burning or to what extent, despite the resulting severe emissions of air pollution. This problem becomes graver yet, as communities expand or new ones are built in proximity to abandoned or unrehabilitated waste sites, in towns such as Shoham, Rishon Le–Tzion and Haifa. Responsibility for rehabilitating the sites lies with the landowner—usually the local government authority. Local government in Israel is generally hard–pressed for finances, and finds it difficult to raise the funds necessary for the task. The consequence is a heightened risk of air and water pollution from scores of large, abandoned waste sites.

Landfill disposal beyond the Green Line

The treatment of solid waste beyond the Green Line is highly problematic: 342 large dumps lacking any infrastructure are in use and waste burning and spontaneous fires are a common occurrence at these dumps. In some Palestinian villages, no collection system exists, and residents bury or burn waste in their yards, or at a small site on the outskirts of the community. Many of these sites are located in hydrologically sensitive areas, threatening water resources of both the Palestinian Authority and the State of Israel. There is also transit of bulk waste and construction waste, as well as varying amounts of municipal waste, from Israel into Palestinian territories. Despite the severe pollution of drinking water, air and soil, and the health risks for residents in these areas, the dumps continue to expand.

Waste reduction and recycling: modest beginnings

In Israel, the only currently practiced alternatives to landfill disposal of solid waste are recycling and composting, which account for approximately 14% of all waste. Recycling is carried out at three waste recovery facilities, which deal with compost, yard trimmings, and separation of cardboard, plastic, and metal. These facilities recycle around 30–40% of the waste they receive. 25% of cellulose used at factories for cellulose products is collected and recycled. A small percentage of plastic and glass is recycled as well, with several municipalities now practicing source separation of PET, cardboard, paper and rags. One plant for recycling scrap metal operates in Israel. This plant also receives tin cans collected in accordance with the Beverage Container Deposit Law.

The fact that the increase in solid waste generation in Israel is twice the rate of population growth indicates a constant growth in consumption (Avnimelech 1999). This also indicates that no significant reduction or stabilization of waste production has occurred. The Ministry of the

Environment's data from 1999 (*Vital Signs 2000*) show that the amount of waste produced in communities with a high socio–economic profile is liable in some cases to be 51 times greater than the amount produced in communities located at the bottom of the socio–economic ladder. Unless efforts are made to reduce waste, the reduction of socio–economic gaps as a result of a rise in the standard of living will bring about a rapid increase in the amount of per capita waste produced. Changing production and consumption patterns is an area where both the Ministry of the Environment and NGOs are active through legislation, education, database development, and initiating pilot projects.

Building public awareness

Public opinion is one of the most important vehicles for implementation of environmental policy. To create public pressure, it is necessary to raise awareness and increase public participation in environmental affairs. Waste management, waste reduction and recycling are areas where the public's role is obvious, extending beyond awareness–building to lifestyle changes.

Education for behavioral change has not taken on the necessary momentum. The activity is limited to schools and pre–schools as part of local initiatives. A few local authorities have integrated education on the subject of waste management into school curricula. The only education center dedicated to the issue, with support from the Ministry of the Environment, is located in the Western Galilee at the Material Recovery Facility "Compost 2000", where about 1,000 students per year participate in educational programs.

Legislation

Changes in consumption patterns can be encouraged through legislation. Israel has passed a Beverage Container Deposit Law, which affords the public a role in recycling. The Ministry of the Environment is promoting a packaging law, which will allow the public to return packages for recycling. Similarly, local authorities are bound by the Collection and Transfer of Waste for Recycling Law, which potentially could become an excellent catalyst for public involvement in changing consumption patterns.

The **Beverage Container Deposit Law,** which went into effect on October 1, 2001, is the first environmental law to require minimization of the waste reaching landfills, based on the principle of EPR (Extended Producer Responsibility). The passage of this law is a tribute to the effectiveness of cooperation between legislators and NGOs in promoting environmental

legislation while facing the opposition of producers, importers, distributors, and even the Ministry of the Environment. The Ministry believed initially that priority should be given to promoting a Packaging Law and therefore refrained from supporting the Deposit Law. After eight years of travail in the legislature, and before the bill's approval in August 2000, the Ministry set aside its earlier opposition and advocated its passage.

In 1994, the Ministry of the Environment began to promote **legislation to reduce packaging**. This initiative is the focus of a committee composed of different parties: government, NGOs, and commercial and industrial interests. At present, commercial and industrial interests are managing to delay any progress on legislation.

In 1993, the **Collection and Transfer of Waste for Recycling Law** was passed, and regulations were adopted in 1998 requiring the local authorities to recycle waste, with targets placed at 10% in 2000, 15% in 2001, and 25% by 2007. Local authorities are responsible for implementing the law, and for encouraging the public to play a role by engaging in source separation of household waste. In fact, the local authorities overwhelmingly ignore the requirements of the law. As the Environment Ministry has not enforced the law, targets are seldom met. In 1999, the Israel Union for Environmental Defense, a non–governmental environmental advocacy group, petitioned the Supreme Court, demanding that local authorities fulfil their reporting obligation and that the ministry use its powers to enforce the law. The petition led to commitments by the Center for Local Government and the Ministry to fulfil their obligations.

Database development

A 1995 survey examined in detail the composition and quantities of municipal solid waste, with secondary attention paid to industrial waste. Other data sources are the annual reports of the local authorities regarding the amount of waste consigned for recycling, in compliance with the Collection and Transfer of Waste for Recycling regulations (1998).

The deficiencies of these information sources compel the Central Bureau of Statistics to estimate quantities of waste for many local authorities. A continuously updated database is an absolute requirement, and serves as a constant reminder for local authorities to examine their practices and seek better solutions. Reporting regulations for recycling must be updated to require data on the kind and quantities of various types of waste designated for different methods of treatment by each local authority.

Municipal collection of household–separated waste

Several pilot projects have been carried out in Israel by the Ministry of the Environment and local government authorities to test the feasibility of involving the public in waste management through household–based source separation. The experiments were carried out in 1972, and later in 1994 and 1998 in towns ranging in size from 10,000 to around 25,000. In general, these efforts have failed, with the exception of the town of Tivon, in the north. Analysis of these projects reveals that the failure does not lie in the unwillingness of residents to change their behavior. On the contrary, the public proved to be enthusiastic and adaptable, and readily performed its part.

The weak link in the public participation scheme was the lack of reliable end–use solutions, and the resistance of local authorities to implementing the necessary long–term changes. Sometimes the failure stemmed from the central government's lack of financial and professional support. NGOs and academic bodies play an important role in these initiatives, and the Ministry of the Environment provides funding and advice. Despite the Ministry's efforts over the past two years in encouraging local authorities to examine recycling alternatives, and even where local authorities could save money by doing so, local decision–makers have generally not cooperated or fulfilled the requirements of the Recycling Law, and continue to display distrust in the public willingness for change.

The Ministry of the Environment has not filled the void created by the local authorities' failure, and has not promoted cost–effective end–use solutions. The Ministry was involved in establishing only one material recovery facility over the past decade (in 1996). Since the public perceives the Ministry as a protector of its interest, the Ministry could take advantage of its image by promoting more projects. This necessitates allocation of budgetary resources and personnel to promoting public participation in source separation. An informed and involved public will strengthen the Ministry's position vis–à–vis other governmental ministries, and will improve the status of environmental protection as one of the more significant governmental goals.

Material recovery facilities

The cost of landfilling mixed waste in Israel is about $8–12.5 per ton, constituting between 2% to 12% of the general cost of treatment (collection, transportation, treatment), which runs between $62–112 per ton. Material recovery currently costs about $20–25 per ton. Under these circumstances, it is no surprise that local authorities should prefer landfilling, unless they

are required to pay the additional costs of long distance transport, including the costs of handling waste at transfer stations.

Given the cost of treating waste at material recovery facilities in Israel, and in light of the fact that the local authorities are not interested in engaging the public in waste management, the most feasible solution is transporting mixed waste to a material recovery facility (MRF), without source separation. Despite the fact that MRFs are the only viable alternative to landfilling in terms of price, they have yet to enter into widespread use in Israel.

In 1999, Haifa, the third largest city in Israel (with 267,000 residents in 1998), made a contract with the Amnir Onyx Co., which operates an MRF in the town of Afula. Through this arrangement, Haifa has become the first major Israeli municipality to comply with the law by recycling 15% of its waste. Events leading up to this arrangement included the closure of an illegal waste site in the city by the Ministry of the Environment, and a lawsuit by the Israel Union for Environmental Defense that forced the Municipality to include recycling in the tender for transfer and treatment of its waste. Haifa's efforts are unique among large cities, however, and will remain so as long as waste management is not given priority at the national level, with the necessary policies and enforcement measures.

Use of household composters

Biodegradable organic waste constitutes about 50% of domestic waste by weight. Separation of organic material within the home can therefore significantly reduce the amount of organic waste reaching landfills. Domestic compostors are one method of treating organic waste at the source. This solution is eminently suitable for residents in rural communities and single unit residences.

In 2000, only 2,600 domestic compostors were in use, amounting roughly to 1% of the potentially suitable households. Every family using a compostor can reduce the amount of waste collected by 0.5 to 1 ton yearly. At present, projects encouraging composting are the result of joint efforts of the Ministry of the Environment, local authorities, and NGOs. The Ministry funds 50% of the purchase cost of a compostor, which runs currently at $87–$100. Even with this subsidy, the cost is high, and purchasers are usually environmental enthusiasts, and not the public at large. Domestic composting can save local authorities the $45–$50 per–ton cost of solid waste collection and disposal, leaving only the one–time investment in a compostor. Despite this advantage and the feasibility at both the local and national level, the rate of composting is marginal.

Other potential applications of recyclable organic waste

Highly–separable organic waste is produced in civilian and military dining halls, in markets, in municipal and domestic parks and gardens, and by agricultural activity. Treating organic waste at a high level of separability would allow exploitation of the organic material for high–quality compost which is valued at $30 a ton, at the compost facility's entrance. The cost of producing compost in Israel has been evaluated at $8–$12 per ton. The price of compost from municipal waste is between $0–$5 per ton, at the facilities' entrance.

The potential of food and market waste has not been exploited, nor has slaughterhouse waste been exploited for production of food for animals. The Israel Defense Forces, with the cooperation of the Ministry of the Environment and local authorities, is examining a scheme for source separation of waste from military dining halls.

According to Ministry estimates, the agricultural sector produces yearly 3 million tons of animal excrement, 1 million tons of produce which is destroyed, and 20,000 tons of plastic sheets. Despite Israel's advanced agricultural sector, this waste is not effectively recycled. Some preliminary experiments have been conducted locally, but no program has been implemented. As most local authorities lack a system for collection of organic agricultural waste, it is generally burned by farmers, along with plastic sheets and chemical fertilizer and pesticide containers, causing severe air pollution. Despite its economic value as a source of high–quality compost, most of the excrement is conveyed via channels to open spaces and riverbeds. Agricultural demand for such compost could provide the key for effective use of this waste as organic fertilizer.

Wastewater sludge from sewage treatment facilities is another source of organic waste, reaching 500,000 tons a year. This waste can be used as a source of energy through anaerobic digestion or as a basis for high–quality compost, when combined with an organic bulky agent. Yet this resource is seldom exploited in Israel. Sewage sludge from the Tel–Aviv metropolitan area, for example, is discharged via marine pipeline into the Mediterranean Sea, rather than being diverted for agricultural uses or energy production. One of the reasons is that municipal treatment systems are generally unable to prevent the entrance of industrial wastewater, which contains high percentages of heavy metals and renders the sludge unusable. Enforcement and documentation of these sources of pollution will allow improvement of wastewater sludge quality, in turn enhancing its suitability for reuse.

Other waste management technologies and practices

Beyond the ongoing struggles between subsidized landfill disposal and recent efforts to introduce recycling/reuse policies and practices, other significant features of solid waste management in Israel merit attention. The first is the emerging interest in incineration, backed by the Ministry of the Environment as well as private–sector investors. The inadequate treatment of hazardous waste and the widespread neglect of construction debris are other important issues. A final area of concern is the wholly inadequate treatment of solid waste beyond the Green Line, exacerbated by the transfer of various forms of waste from Israel into these areas.

Incineration of municipal solid waste

In the absence of a comprehensive, updated master plan for solid waste management, which includes specific targets and schedules, the Ministry of the Environment has been sidetracked by initiatives and projects that may pose serious environmental risks. A clear example is the proposed construction of a large–scale solid waste incinerator in the Haifa metropolitan area. This area already suffers from poor air quality, which can explain the high reported levels of disease and mortality from cancer, cardiovascular and circulatory disease, as compared with other large cities, such as Jerusalem and Tel–Aviv. Installation of an incinerator is liable to aggravate the pollution.

The Ministry of the Environment has offered to promote the Haifa area incinerator by subsidizing the difference between the expected cost of incineration and the lower cost–per–ton of current waste management programs. In a region of the country where recycling has begun to take hold via two material recovery facilities and a number of local recycling programs, the Ministry's subsidy is likely to divert substantial quantities of waste away from recycling.

Worldwide, incineration costs around $70 per ton, and in Israel too the costs are expected to be high in comparison with MRF recycling, whose cost is in the range of $20–25 per ton (not including source separation). The Ministry claims that incineration is a legitimate option for Haifa despite the fact that no alternatives were examined, such as recycling, anaerobic digestion, and others. Neither the Ministry nor the Haifa Municipality has examined with sufficient thoroughness the increased air pollution that the proposed incinerator can be expected to produce.

Among professionals, incineration is viewed as a controversial technology, with regulations made more stringent periodically. The faulty operation of the hazardous waste incinerator in Israel, which was closed down for a

month in 2001 at the request of the Ministry of the Environment, is proof of the grave dangers accompanying incineration, especially when it is done at low cost, without appropriate infrastructure for monitoring and analyzing on location. Experience gained worldwide indicates that the best infrastructure for combined treatment of waste relies on a broad base of recycling, and not on replacing recycling technologies with incineration.

Management of hazardous waste

Industry, commerce and agriculture represent the main sources of hazardous and toxic waste, amounting to more than 200,000 tons of waste per year. Most hazardous waste is treated in a proper manner, but a small unknown portion of hazardous waste is dumped illegally along roadsides or is transported to conventional landfills which are not equipped to handle this kind of waste.

Currently, only one hazardous waste site operates in Israel, in the Ramat Hovav Industrial Zone, in the southern part of the country. The site contains large amounts of waste discarded there from the time of the site's installation. Much of this waste is still unidentified, and is being treated by subcontractors, whose work is not always highly professional.

Comprehensive treatment of toxic waste is usually not integral to production processes in factories, and responsibility is transferred to the hazardous waste site. This arrangement is convenient for the factories, but creates serious hazards because of the transportation and concentration of these materials at a central site.

The official excuse for the faulty treatment of hazardous waste is that authority is dispersed among various government ministries. The transportation of hazardous materials, for example, is the domain of the Ministry of Transport rather than the Ministry of the Environment. As a result, the risks involved in the transport of hazardous materials devolve upon a government ministry with little expertise in the field of environmental protection.

Household toxic waste is not treated as hazardous waste, and is disposed of in conventional landfills, causing serious hazards. According to Environmental Services Company Ltd. (which operates the Ramat Hovav hazardous waste treatment plant), approximately 5 kg of household hazardous waste per capita is generated each year.

The Ministry of the Environment and the local authorities have nominally cooperated on a project for collection and transport of batteries to a hazardous waste site. This project has made only painstaking progress, however, in part because of the local authorities' reluctance to collect the batteries at commercial centers and schools. The Ministry, in turn, has been lax in promoting the project over time.

Construction waste

According to estimates of the Ministry of the Environment, Israel produces annually 350 to 1,000 kilograms of construction waste per capita, or some 2 to 6 million tons every year. Roughly 50% of this waste is discarded along roadsides, in open spaces, and in illegal landfills. Over the years, vast amounts of construction waste have accumulated near most population centers.

Construction waste is cleared away by private contractors, many of whom are unlicensed and unsupervised. Many of them also engage in the theft of sand and topsoil, filling in the illegally gouged holes with construction waste that has been collected for a fee at construction and demolition sites.

Lack of enforcement on the part of central and local government is responsible for this predicament. The central government sets conditions for the licensing of landfills, but pays scant attention to the problem of collection and removal of construction waste, where the problem actually begins. In general, local authorities belittle the importance of supervising disposal of construction waste despite their obligation to do so, expending most of their energy on supervising construction processes.

The central government must develop a detailed national plan for solving the problem, first by outlining the desired division of labor between the central and local government in relation to supervision and enforcement, and second, by requiring all contractors who deal with construction waste to obtain a license. Another approach would be to adopt a solution modeled after the municipal solid waste management system, where disposal is carried out by a limited number of subcontractors who would be approved by the Ministry of the Environment, and work in coordination with the local authority. It should be noted that, despite the clear advantages of recycling construction waste, and the almost identical costs of recovery of aggregates as compared to landfilling them, hardly any recycling activity exists. One of the factors inhibiting use of recycled aggregates is the lack of regulation or guidelines governing the use of recycled materials for infrastructure and construction.

Summary

- 13% of greenhouse gas emissions in Israel come from solid waste landfill sites (1996 data).

- The State of Israel manages its waste based on National Outline Plan 16, dating from 1973–74. An updated master plan is needed as a step toward reduced landfill dependence, and a transfer to environmentally friendly technologies.

- Databases in Israel for the composition and quantities of waste are deficient, because local authorities are the primary information source. A periodic national survey of waste should be conducted, and enforcement of the local authorities' regular reporting requirements is necessary.

- Israel continues to rely on landfills as the primary means of solid waste treatment and disposal. The low cost of landfill disposal ($8–$12.5 per ton) prevents the adoption of any truly environmentally sound alternative technologies. Decision–makers must re–examine their conventional cost–benefit analyses of solid waste management options, revising their calculations to include the economic externalities of landfill disposal. These considerations should lead to elimination of present subsidies for landfilling in the form of free land–use and the absence of liability for long–term environmental damage.

- The central government displays a clear preference for consensual solutions, but as a result of its placatory policy, 35% of landfilled waste reaches unlined waste dumps.

- Despite the existence of legislation requiring local authorities to divert 15% of their waste to recycling at present and 25% by 2007, most local authorities do not comply with the law, as the result of insufficient enforcement on the part of the Ministry of the Environment. In order to achieve integrated solid waste management, a concerted enforcement campaign is required. Local authorities must be made to comply with the Collection and Disposal for Recycling Law.

- Local authorities display ongoing distrust in the public's willingness or capacity to participate in waste management through source separation, despite the fact that pilot projects have successfully demonstrated the public's readiness to participate.

- The only law directly involving the public in advanced waste management is the Beverage Container Deposit Law, which took effect in 2001.

The law has received public support, but is suffering setbacks due to resistance of producers and distributors of beverage containers.

- Educational initiatives geared toward lifestyle changes have been minimal, dependent largely on local government and NGO initiatives with little leadership shown by the Ministry of the Environment.

- Despite the fact that the composition of solid waste in Israel contains a high degree of organic material (around 50% by weight), the country has not taken advantage of composting as a viable alternative, either by creating central installations, or through encouraging domestic composting. Sources of organic waste should be matched with the high demand for quality compost in agricultural areas. This is particularly true for the southern part of the country, whose highly developed agriculture is based on poorly aerated soils, a deficiency that can be readily corrected by the addition of compost.

- The suitability of incineration to Israel as a means of managing various solid waste streams must be critically evaluated, before it is implemented as an alternative to waste reuse, recycling, and landfill disposal.

- Currently, only one hazardous waste site operates in Israel, in the Ramat Hovav Industrial Zone, in the southern part of the country. The site contains large amounts of waste discarded there from the time of the site's installation. Much of this waste is still unidentified, and is being treated by subcontractors, whose work is not always highly professional. Household toxic waste is not treated as hazardous waste, and is disposed of in conventional landfills, causing serious hazards.

- Since Israel has no program for separating and treating hazardous household waste, much household hazardous waste arrives at conventional solid waste landfills in mixed form. Unregulated landfills, as a result, have become sources of severe pollution, and even regulated sites will become hazardous once their biogas and leachate drainage systems collapse, years after the landfills close. The problem needs to be recognized, and legislation is required to assure proper collection and treatment of household hazardous waste.

- The manner in which construction waste is treated in Israel is a national scourge. According to Environment Ministry estimates, 50% of construction waste is discarded on roadsides and in open spaces. The situation requires tough measures by local and central government bodies, including a reduction of the number of companies licensed to deal with this waste, so that their activity can be supervised.

- Undocumented quantities of waste travel beyond the Green Line to illegal waste sites, where waste is disposed of in unlined dumps or is treated by open burning. The transport of waste beyond the Green Line should be prevented by enforcement action against the relevant governmental and private bodies responsible for this environmentally damaging practice.

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POPULATION DYNAMICS AND SUSTAINABILITY IN THE ISRAELI CONTEXT

Navigating between demographic warfare and Malthusianism*

Yaakov Garb

Summary

This essay examines population dynamics as an environmental issue in Israel in light of Agenda 21's broadly integrative approach to the subject. Israel's national planning policies treat population growth rates as a driving variable, to be predicted but not altered; this amounts to internalizing a pro–natalism that is deeply entrenched and broadly consensual, manifest in a range of policies and measures. With Israel not managing many of the impacts of its current populations, the doubling of population size every three decades or so surely merits consideration.

Until recently, the environmental community has not dared challenge this consensus by broaching population as an environmental issue. As it does, however, it is important that treatment of the issue draw on the hard–won insights of the population–environment debate that has evolved elsewhere over recent decades. In this spirit, this essay discusses population as only one contribution to growing and unsustainable environmental impacts, which are due in large measure to increased consumption. In the long term,

* This essay derives from a more extended research project in progress, conducted under the auspices of the Jerusalem Institute for Israel Studies. That research is summarized in a

fertility rates must surely drop; in the short and medium term, however, high–consumption low–fertility lifestyles may be as harmful as low–consumption high–fertility ones. The essay also warns of the political tensions that surround and threaten to infiltrate demographic debates in Israel. It concludes with some proposed guidelines for tackling the population/consumption/environment issue in Israel in a way that is both environmentally committed yet preserves the holistic development view of Agenda 21.

Introduction

The treatment of population issues in Agenda 21 and Israeli national planning

Chapter 5 of Agenda 21 calls for developing and disseminating knowledge on the links between demographic trends and factors and sustainable development, and taking these into account in national policies and local programs.

In its muted tones and emphasis on the interaction of multiple factors, Agenda 21 is a far cry from some of the early classic environmental statements (Paul Ehrlich's 1968 *The Population Bomb*, for example), which identified population growth as the "ultimate threat to humanity." Reflecting developments in the discussion of environment and population in international forums, Agenda 21 never places population growth on the table in isolation, but always as a component of a larger complex of issues, notably increased production and unsustainable consumption patterns, and within a context of broad equity and gender concerns.

Israel's official response to this component of Agenda 21, in its "Draft Review and Assessment of Progress in Implementing Agenda 21 in Israel," dodges even these rather tame proposals. Thus, the sum total of policy treatment of the topic in the Israeli document reads as follows:

> In light of Israel's unique demographic patterns, population concerns are integrated into national planning policy and decision–making. The Central Bureau of Statistics provides updated information on demographic trends, and land–use master plans take account of the implications of demographic trends on development needs and environmental protection.

As a summative description of policy consideration, "integration" and "taking into account" have a lot of slack in them. Were these trends and impacts considered in the sense of "taken into account of and accommodated to" or in the more normative sense of "scrutinized with an eye to acceptance or rejection?" And which environmental dimensions were considered, and how?

In fact, if we examine the kind of land use master plans referred to by the Review's (non–) statement on demography and environment, we find that this "consideration" is of the most general and inert kind. In the country's major national planning documents (such as the National Outline Plans *NOP31* and *NOP35*, and the *2020 Master Plan*), population is a driving variable, like the climate, to be anticipated carefully, but not altered. Thus the "population" section of these plans is solely an attempt to provide reliable demographic inputs to other sections of the plans (transport, infrastructure, population distribution, housing needs, employment, agriculture, social needs, macroeconomics, etc.).[32] Demographic predictions assume the continuation of current pro–natalist policies.

The augmentation of Jewish population size as a national priority

The implicit pronatalism of Israeli national planning documents should be no surprise. A pronatalist policy has long been a part of the country's national strategy, and a host of concrete policy measures reflect a commitment to augmenting the population of the Jewish majority through high birth rates and immigration. The measures supporting large families and thus increasing population size include child allowances, and family–size linked aid in housing, discounts on municipal property taxes, aid for working mothers, health tax payments, prenatal and postnatal aid, alleviation in army reserve duty, and pro–natalist family planning. In addition, there is extensive encouragement of and support for Jewish immigration. One of the most debated levers of pro–natalism is the Large Families Law, which grants parents rising allotments for children: for the fifth child five times that which they receive for the first child, and two and a half times what they receive for the first two children together.

It is important to be more ethnically precise about Israel's pronatalism. The motivation seems to be augmentation of Jewish rather than overall population size. This bias is explicit (as in the case of encouragement and support of Jewish immigration only), or through coded exclusion mechanisms. The Jewish State's sense of urgency in augmenting Jewish populations must be seen in historical context. When it was established in 1948, the country was reeling from the genocidal loss of a major portion of worldwide Jewish populations—the 6 million European Jews murdered in the Holocaust a few years prior. And the country was struggling to establish itself and survive in a hostile setting, where it was far outnumbered numerically. In addition, the high birth rates of Arab populations in Israel and its neighbors were perceived as a threat. Thus, expanding Jewish populations became a largely consensual national goal, and has remained so until the present.[33] The JIIS report on which this essay draws, describes in

more detail the importance placed on demographic engineering by both sides in the Arab–Israeli conflict, and demonstrates that what is usually true in most contexts is inescapable in the Israeli one: to talk demography is to talk politics.

The historic absence of a population–environment debate in Israel

Because of this deeply entrenched and broadly consensual pronatalism, even the markedly high population growth rates in Israel—a doubling of population every two or three decades—were not raised as a topic of environmental concern until very recently. This, despite the ebb and wane of "population" as a key environmental concern internationally. Even when raised by environmentally–minded people, the concern over impacts of Israel's population growth has been tempered with great realism about the prospects of modifying these trends through policies.

For example, a 1996 review by one of Israel's foremost environmental journalists of various environmentalist stances on the environmental implications of population growth, and its implications for water resources, touches almost entirely on ways to accommodate and plan wisely for this inevitable growth. This journalist claimed that:

> among planners and politicians, there is currently a growing awareness of the problem of population growth, alongside almost complete agreement that there is no national justification, nor practical possibility, to change the rate of population growth from above.

It is only in the last few years or so that there have been some voices willing to brave the taboo against considering policies to restrain population. Now some lone environmental advocates have dared to softly raise the calls for population control that are (or rather, were) a standard component of the environmental agenda in many other countries.

I talk in the past tense about population control as a key element of western environmentalism, since the U.S. environmental movement has stepped back considerably from the population apocalypticism of the '70s. Some regard this as a cowardly "politically correct" retreat from the foundational place of population in any environmental agenda.[34] But it is probably more accurate to see this (also) as a retreat in the face of the growing complexity of making population–environment claims to more sophisticated policy audiences. A watershed in the conceptualization of thinking about the linkages between population, environment, and development was the 1994 Cairo Conference on Population and Development. The conference changed the landscape of the population debate by giving prominent expression to scholars and advocates who, in the years leading up to the conference, had

emphasized the relation of women's well–being to population growth rates, Neo–Marxist critiques of Malthusianism, and the emphasis by developing countries on the role of over–consumption, rather than over–population, as a key environmental threat.

Goals of this essay

Whether one regards this shift in international population discourse since the '70s as maturation (as I do), or retreat, the more nuanced debate on population in recent decades is not echoed in the nascent claims raised in the last few years in Israel. As detailed in my JIIS essay, the first recent public arguments about population size as an environmental concern in Israel have been made in terms that seem drawn from a far earlier era of population discourse. The reaction to these claims is similarly crude, dismissing them as scandalous, unthinkable, and contrary to core national values.

Thus, in contemporary Israel we find, on the one hand, a consensual nationalistic pro–natalism and support for immigration that regards anything else as heretical; on the other, there is a danger that the first environmentalist attempts at placing the subject on the discussion table will be starkly reductionist, not reflecting the hard–won lessons of extensive debate on this topic.

This essay attempts to navigate between these two extremes. It uses Agenda 21's call for action on the topic of "Demographic Dynamics and Sustainability," (as well as the related call on "Changing Consumption Patterns") to carve out a space—between taboo and reductionism—in which these issues might be discussed given Israel's unique circumstances and sensitivities.

Thus it navigates between two poles of concern. On the one hand, there is little reassuring evidence that the region has demonstrated its capacity for dealing tolerably with the environmental impacts of current populations. In its absence, this essay rejects the unreflective adoption of purely extrapolative demographic scenarios in Israeli plans, and the belief that Israel's environmental regimes do and will continue to address environmental pressures.[35] Given stressed systems in most spheres (contamination of aquifers, inadequate toxic and solid waste disposal, the rapid consumption of open spaces, and many others . . .), the burden of proof that future larger populations will be accommodated is upon those who plan under the assumption that within a generation there will be 10 million people within Israel's borders and 15 million between the Jordan and the Sea. At the same

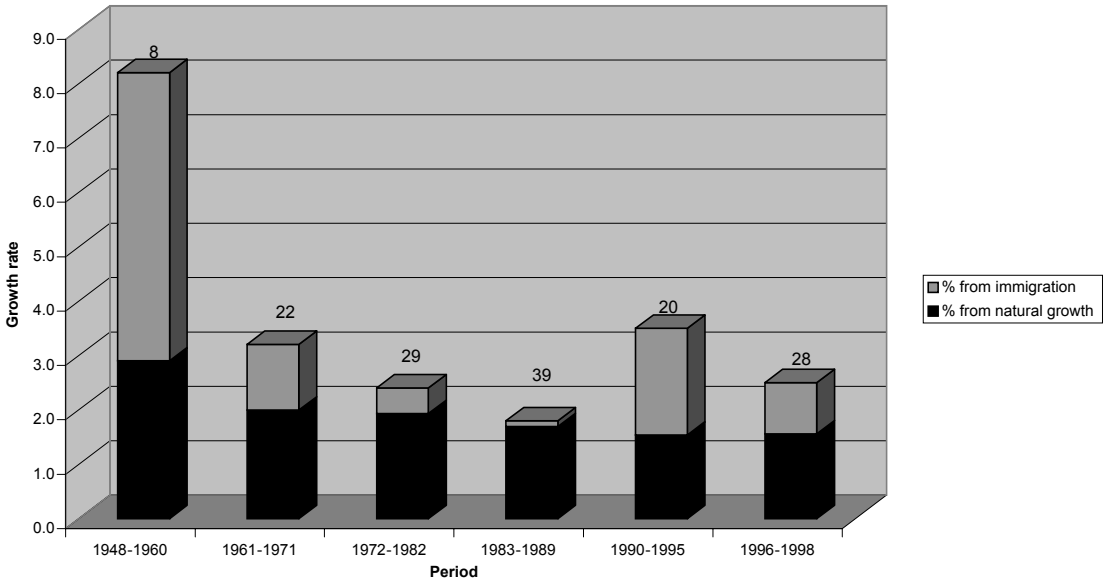
time, however, I urge that this reflection incorporate several lessons of the demographic–environmental debate over the last decades, such as those voiced at Cairo. Finally, the essay cautions that analyses of these issues must avoid the likely leakage of various national, ethnic, and religious tensions into well–intentioned "environmental" discussions of demographic trends.

Demographic trends

Israel's population has grown from 1.2 million at its founding in 1948, to over 6 million. As the graph below shows, overall annual growth rates have been consistently above 2%. These are more characteristic of less–developed countries than of developed countries, whose growth rates are typically a tenth of this: on the order of 0.2%. The graph illustrates the dramatic demographic consequences of even a couple of percentage point difference in growth rates, as evidenced by the hypothetical doubling times indicated above each bar in the graph.

Israel is unique, however, in combining population growth rates typical of developing regions with the consumption characteristics of developed countries. Thus, while the average total fertility rate of an Israeli woman is 1.2 children more than a British one, Israel's per capita GDP is not that much lower than the United Kingdom's ($18,400 versus $22,000), and its annual per capita CO_2 production (9.7 versus 8.9 metric tons) and electricity consumption (5.5 versus 5.3 kilowatt hours) are slightly higher.

Israel's high fertility is only part of its high population growth rate. As the graph shows, natural growth has remained fairly constant over the history of the state, with a substantial and varying portion of overall growth due to immigration. Even with no immigration, Israeli society would face the tremendous task of accommodating a population that doubles every 40 years or so.



Israel's average annual rate of population growth, with corresponding doubling time (in years) above bars. Derived from data from the Central Bureau of Statistics.

A point that recurs in this essay is that fertility is far from uniform with Israeli society: sub–populations such as the ultra–orthodox and some portions of the Arab population have far higher fertility levels, and from this stems much of the political valence of demographic issues in Israel. While it is hard to imagine how current aggregate population growth rates could be sustained, discussion about the environmental imperative for its reduction must disaggregate the various trends and sectors that contribute to environmental impacts.

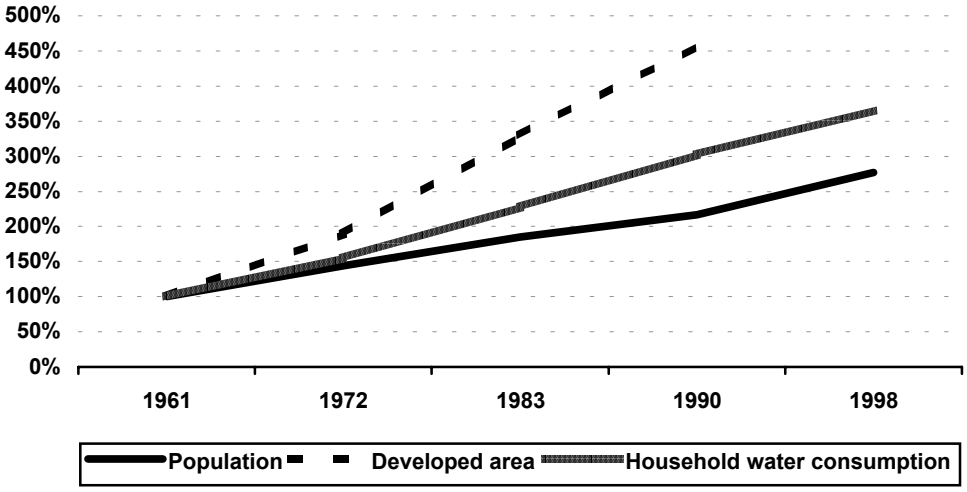
Population–consumption tradeoffs

As other chapters in this anthology testify, the environmental impact of current Israeli populations is already excessive in many dimensions. All things being equal, the environmental stresses on a region are a direct function of the number of inhabitants. But all things are not equal. Impact is a function not only of numbers of people but of how these people live; and various sub–populations live differently. Thus environmental impacts must be disaggregated for time period, kind of impact, and in other ways.

Disaggregation by kind of consumption

During Israel's last 4 decades, the massive expansion of population size (more than a doubling), was only a part (in some cases a small part), of the growth of this population's environmental impacts. The graphs below show some measures for which consistent national–level statistics are available. Developed area and household water consumption, for example, have grown at a rate significantly faster than would be expected simply from growth in the number of people. In spheres such as land development, then, rising consumption levels (or the increase in "ecological footprint") should be considered as at least as significant a "problem" as rising population.

Growth in population and consumption since 1961



There are surely realms in which the past growth of environmental impact is primarily a function of growing population, and these should be identified. And others, in which the effect of population growth is literally negligible compared to the impact of lifestyle/technological changes.

Take, for example the rise of mass motorization in Israel: a revolution that reworked space at neighborhood, municipal, and national levels, and greatly inc gly
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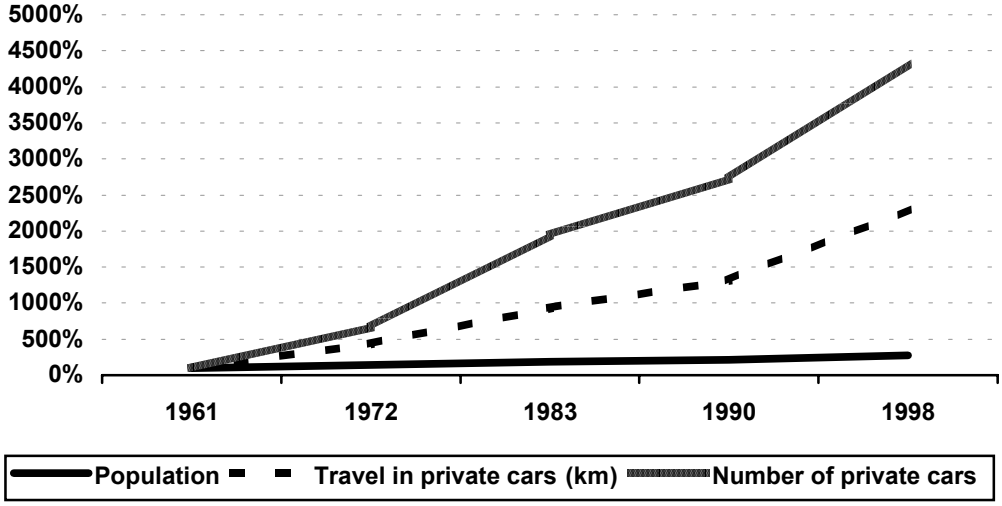


Growth in number and use of private cars (note uneven spacing of time axis)

It has been argued that population growth is critical precisely because consumption levels are rising: each additional person currently causes much larger impacts than 4 decades ago. The logic behind this claim is revealing. It rests on an implicit sense that the growth in consumption levels is somehow a more "natural" and unstoppable process than population growth. (After all, one might argue the reverse: that because populations are so much larger now, it is critically important to freeze or reverse the growth in individual consumption.)

As discussed in the JIIS essay, there are spheres (such as car ownership) where population increase has contributed only a small part (in this case one third) of the growth, and others in which it is more dominant. And, of course, given the exponential nature of population growth, a pulse of population growth will have a long–lived multiplicative effect a generation later. But in several important spheres, the growth in environmental impacts over the coming 50 years may be predominantly a function of changes in technology and lifestyle.

Thus the environmental impacts of future population growth must be disaggregated by the type of impact. Where broad adoption of a new consumptive technology or lifestyle has already run its course, or when a consumptive technology is in a phase of significant efficiency gains, population growth will have greater weight in its overall environmental impacts.

Disaggregation by social sector

A second kind of disaggregation is necessary when considering the contribution of population growth rates to environmental impacts: by sectors within Israeli society. This is necessary because subpopulation growth rates and consumption levels (and thus per capita environmental impact) are quite different.

For example (to continue the transportation emphasis), the 13 settlements (of population over 2,000) with the highest levels of motorization rate (mostly wealthy neighborhoods and/or suburban settlements) have an average motorization rate six times the average in the bottom 13 (which are mostly Arab, Ultra–orthodox, or "development towns."). Similarly large ratios hold with respect to other indicators of consumption for which we have settlement–level data; for example, average water consumption in the top–consuming eight towns is four times that of the bottom eight).

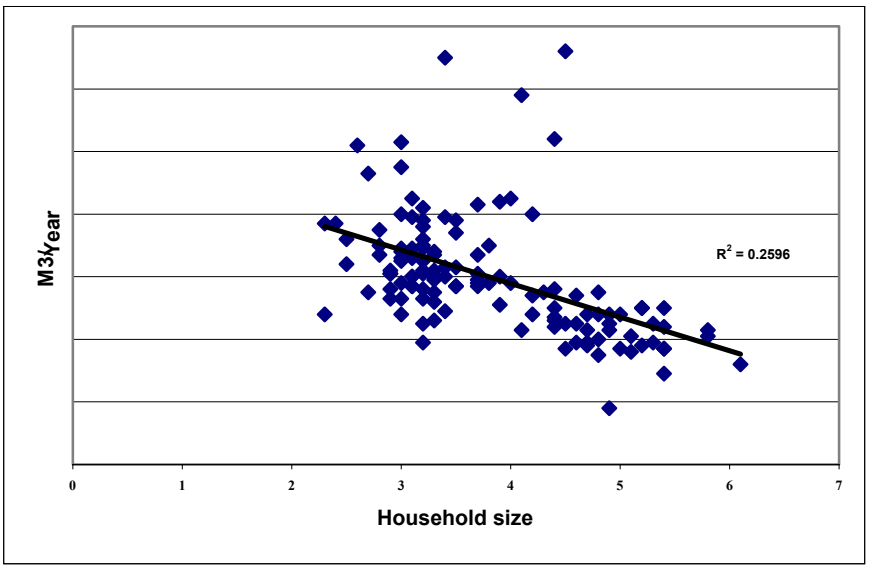
Settlements with the highest and lowest

household water consumption in Israel

Town	**Average water consumption (cubic meters)**
Kfar Shmaryahu	156
Kochav Yair	132
Omer	130
Meitar	118
Macabim/Reut	104
Ramat Hasharon	103
Eilat	102
Herzlia	95
AVERAGE	**117.5**

Town	**Average water consumption (cubic meters)**
Mashad	37
Beitar	37
Magar	36
Um El Fahem	35
Tel Sheva	32
Kasra	30
Boayna	29
Arara	18
AVERAGE	**31.75**

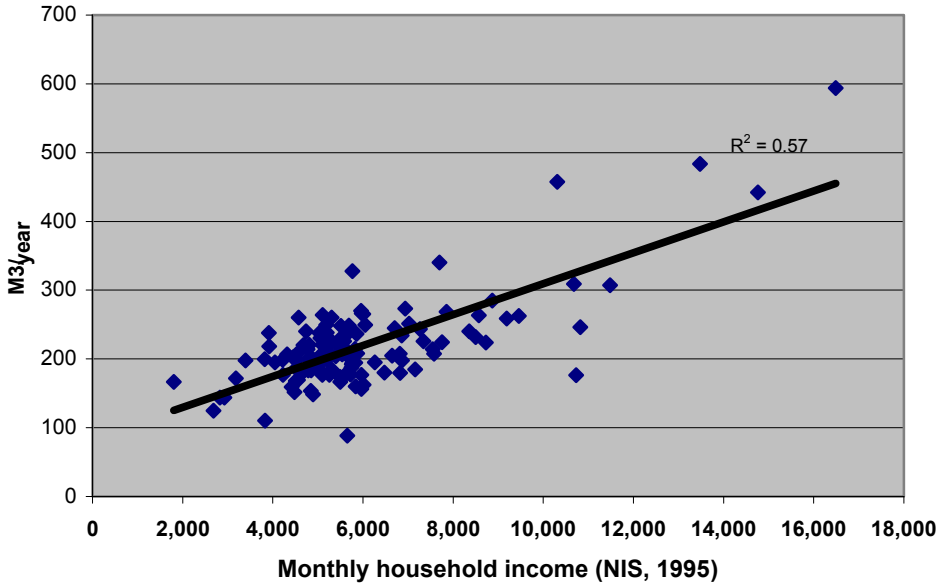
These disparities in consumption level shape household consumption far more than the number of people in the household. Thus, we cannot argue against large households on the basis that they create more environmental impact. At the most, the claim might be made that they contain the potential for higher impact in future generations, once each of the many children creates their own household—an important claim that is discussed below. But, within the current generation at least, larger households actually consume less than smaller households do.



Household water consumption has a small negative correlation to average household size in Israeli towns

This argument may seem paradoxical, until we consider that household size and household income tend to be slightly inversely correlated. It is because they tend to be poorer that larger households consume less. For example, as the graph above shows, there is a weak inverse correlation between household size and household water consumption.

On the other hand, household income is a strong correlate of water consumption, as shown below.

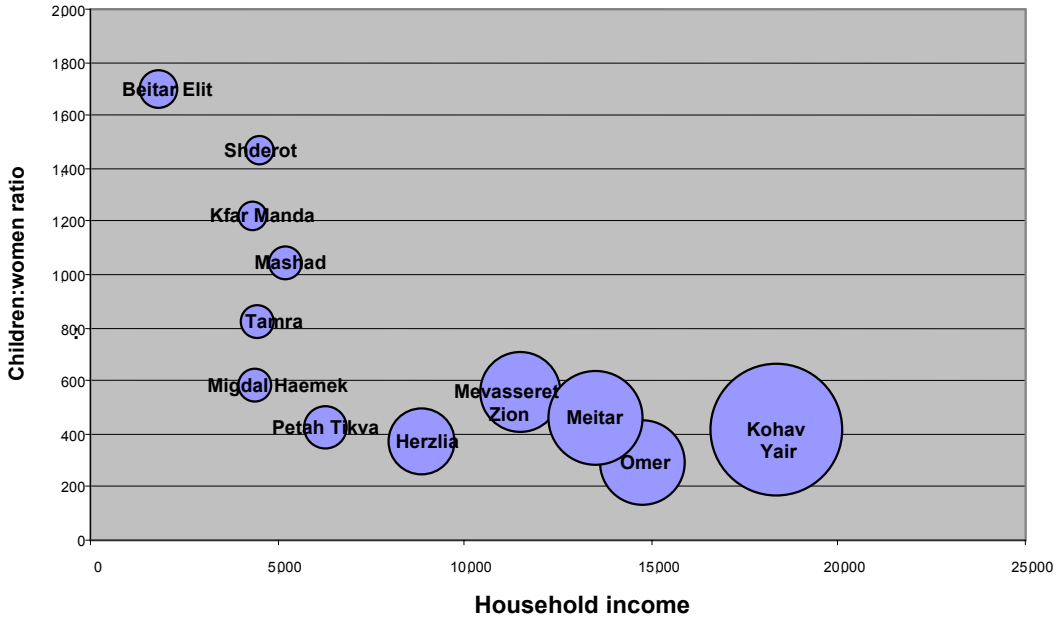


Household water consumption has a strong positive correlation to household income in Israeli towns

Similar correlations hold for other consumption variables for which statistical information is available.

To graphically illustrate the relative insensitivity of household–level consumption to fertility, and its considerable sensitivity to income, I have created an aggregate consumption index derived from those consumption measures available in the Central Bureau of Statistics (CBS) records for localities. These statistically–available measures (average household car ownership, clothes–dryer presence, and water consumption) can serve as proxies for overall consumption. The graph below shows this index for some familiar settlements, which have various fertility levels but a similar income (the vertical strip), and others that have similar fertility levels but varying levels of income (the horizontal strip). The radius of the bubbles represents

the value of this composite consumption index.[36] An increase in average fertility (and presumably household size) does not raise this household–level consumption. An increase in household income does.



*Composite **consumption** index (bubble radius) as a function of household **income** (shekel a month) and **fertility** (children to women ratio, a fertility measure derived from census data).*

But what about the impacts of the future households that will issue from large families?

While a large family's environmental impacts are less, on average, than those of a smaller family, surely this will rapidly be negated as the many children in large families set up their own households? An eight–child household might consume less than a two–child household now. But surely the sixteen households (four times four) a large family is likely to produce in two generations (50 years) must consume more than the single household yielded by a family with replacement fertility (of slightly over 2 children)?

However, even a crude modeling of this self–evident proposition, turns up some interesting findings, when sub–population consumption levels are taken into account. This is because the high–fertility sectors of Israeli society (primarily ultra–orthodox [Haredi] and Arab communities), are also low consumption. If policies are to be symmetrical with respect to both kinds of contribution to environmental impact (the number of people and how they live), then the implications of altering each must be considered.

While carefully done, these findings are not presented as extensive models. They are intended to illuminate the rough contours of the dynamics involved —as a thought experiment. These can raise for discussion some of the hidden assumptions and intuitions that must be tested explicitly and rigorously if population is to be placed on the public policy agenda. The modeling is done for the time period up to 2050, which is probably the limit at which foresight ends and science fiction begins.

Let's take, for example, the policy imperative often implicit within environmentalist population concerns: reduce Haredi (ultraorthodox) fertility to the current secular levels. A sober policy analysis must check carefully whether this reduction is warranted on environmental grounds, and its feasibility and impact compared with other kinds of policy measures.

What are the environmental gains of reducing Haredi fertility levels? We have already seen that large households consume slightly less than smaller ones. But what about the longer term? The top right scenario in the diagram below shows a modeling of high Haredi fertility gradually dropping to the "desirable" replacement levels of the secular population over the next 50 years. This results in a small but not exceptional drop in overall environmental impacts.

Other scenarios are also instructive. Spectacular environmental gains are made if non–Haredi consumption levels gradually drop to the current low levels of the Haredi community, whether or not Haredi fertility drops or not (the right and left middle scenarios shown below, respectively.) Of course, if Haredi fertility remains at its current high levels, with Haredi consumption beginning to rise to secular levels, (the bottom left scenario in the figure below), environmental impacts rise, literally, off the chart.

An interesting scenario, illustrated in the bottom right of the diagram, occurs when Haredi fertility gradually drops to the "desirable" replacement levels of the secular population over the next 50 years, but over the same period the currently low levels of Haredi consumption gradually rise to match (high) secular levels. We see that a scenario of Haredi fertility reduction combined with consumption equalization yields no environmental gain relative to the business–as–usual scenario (depicted in the top–left).[37] In other words, replacing Haredi lifestyles (high fertility/low consumption) with secular ones (lower fertility/high consumption) would not reduce environmental impacts in the foreseeable future (by 2050). Lowering Haredi fertility only "works" environmentally, if we assume Haredi consumption remains at levels far below non–Haredi levels.

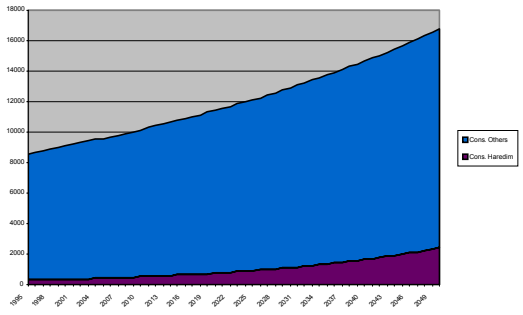
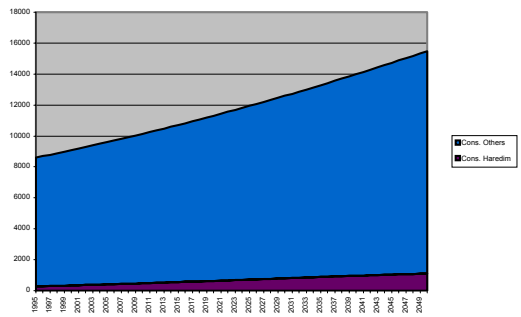
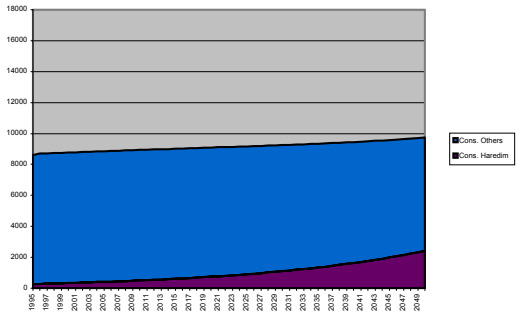
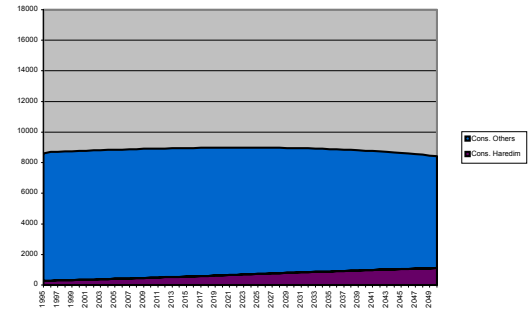
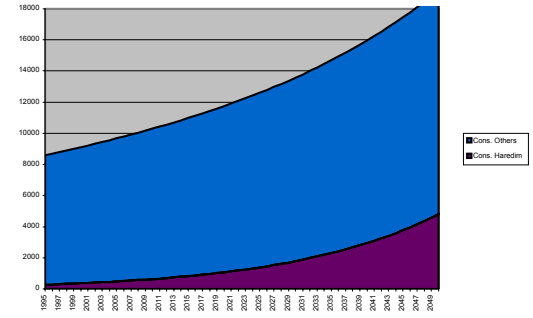
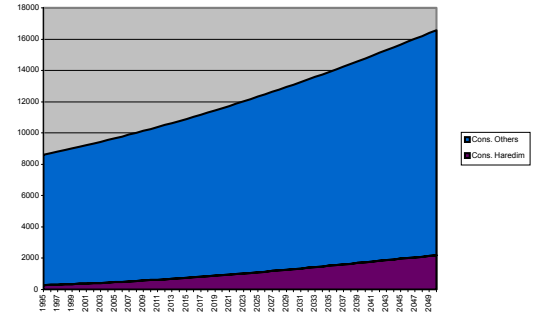
This latter raises important empirical (and perhaps ethical) questions. To what extent is low Haredi consumption a product of high fertility, which will

disappear if and when fertility drops; and to what extent is it an outcome of culture that gives priority to communal life, spatial proximity (especially on Sabbath, when car travel is impossible), and non–material values. Is high Haredi fertility "bought" through low consumption? Do environmental considerations allow adjudication between one community that regards relatively high levels of consumption and lower fertility as natural, and another that regards high fertility "voluntary simplicity" as a norm—or should the issue be settled only in the political sphere?

These results show that despite its "intuitive" appeal, Haredi fertility reduction may not necessarily lead to significant environmental gains over the coming 50 years, which is about as far forward as it is reasonable to conjecture. They point, in fact, to other adjustments of lifestyle—namely reduced consumption levels—that might have far more consequence over this period. (Note that reduced consumption can occur through reduced demand or through more efficient production of each unit consumed.)

A similar situation holds with respect to the reduction of fertility of the non–Jewish (Arab) population, whose consumption is also considerably below Jewish secular levels.

While the modeling is crude and preliminary, the findings are robust enough to alert us to the fact that public–policy prescriptions for the coming decades must attend to the consumption side of the equation as seriously as to the fertility side.

	Haredi population growth remains at 1995 levels (4%)	Haredi population growth drops to non-Haredi levels (1%) over 50 years
Non-Haredi consumption remains at 1995 levels		
Non-haredi consumption drops to Haredi levels		
Haredi consumption rises to non-Haredi levels		

The environmental consequences of various hypothetical permutations of adjustments in Haredi and non–Haredi fertility and consumption levels. The area–graphs depict consumption/impact (with Haredi consumption below, in darker tones). A 2:1 per capita consumption ratio between non–Haredi and Haredi is assumed, as discussed in the JIIS report.

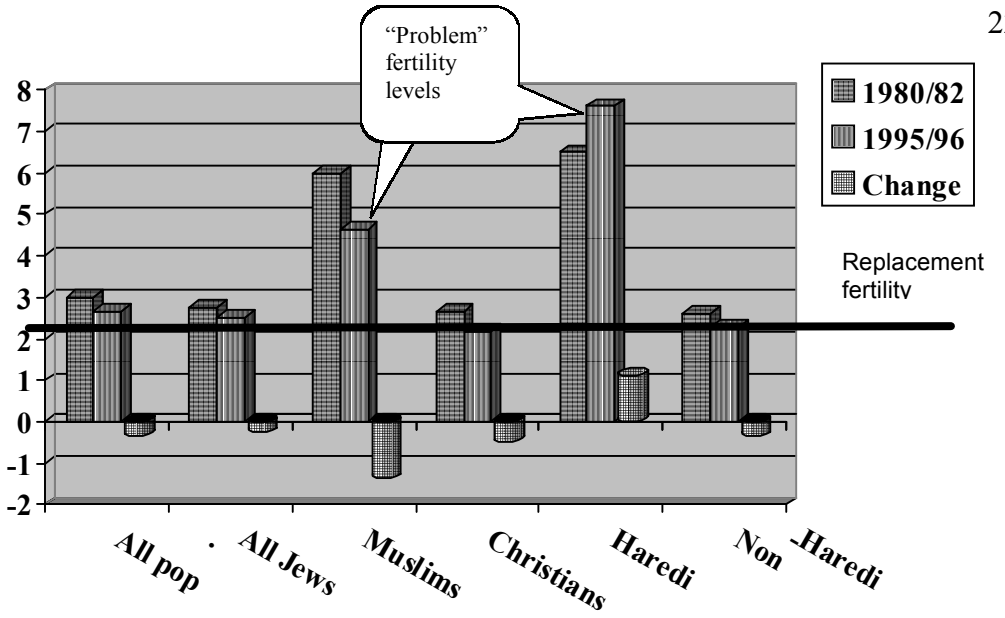
Political leakages into environmental–demographic debates

From Malthus onwards, there has been a tendency for social tensions (ethnic, religious, class) to find expression in demographic terms. (Malthus' anxieties about Poor Laws in England, as viewed from his particular location in English society, were neatly masked behind the seemingly self–evident logic of his claims about the arithmetic growth of food sources, versus the geometric growth of population.) And in countries around the world, "demographic engineering" of various kinds (pronatalist policies, involuntary and induced assimilation, forced population movement, boundary alterations) is a long–standing extension of inter–ethnic conflicts, and of the struggle for control of territory and its resources.[38] This should make us think twice and three times about demographic claims, the social location of the claimants, and the social and political anxieties they might represent.

This is especially true in Israel, where demographics has been and remains an implicit, and often brazenly explicit, element of the conflict between Israel and its Arab neighbors, of the relations between the Jewish majority and Arab minority within Israel, of Jewish secular–ultra–orthodox relations, and in the not–so–distant past of social tensions between North–African and Ashkenazi Jewry.

In such a context, it is exceedingly important to make sure that these preoccupations and biases don't infiltrate into a seemingly neutral discussion of the environmental need for reducing population growth rates. For, besides being analytically inadequate, a simplistic call of "too many people" could become a dangerous flag to be raising in a region fraught with ethnic and religious tensions.

The immediacy of this danger is evident from the simplest breakdown of the subpopulations whose fertility levels exceed replacement levels (the dashed line slightly over 2, in the graph below). This immediately casts the "demographic problem" as a "Muslim" and "Haredi" (ultra–orthodox) problem, so that these two minorities are the natural and immediate target of "population control" policies. (Indeed, one might also question the statistical dichotomy of Haredim/non–Haredim itself.)



Subpopulation fertility levels (After Berman, 1988).[39]

This background should make us vigilant that the political and social anxieties that pervade political life in this region do not infiltrate into environmental discourse. There may be temptations to add ecological claims as one more kind of ammunition to the quite explicit attempts to restrain the growth rates of Arab and Haredi sub–populations. These attempts stem from political anxieties about the growing electoral power of the sub-populations (Arabs and Haredim), their dilution of the Jewishness of the state and potential as a Fifth column (Arabs), and resentment at their "parasitism on the productive elements of society" through "not contributing to the economy" or serving in the army. Thus, Dr. Dan Ben–David, who teaches in Tel Aviv University's Public Policy program, warns of the trajectories that are carrying the country to a point of no return, including the fact that[40]

> ...[H]alf of all children in the first grade are enrolled in the ultra–Orthodox and Arab educational systems. Given the disproportionately high birth rates of these two population groups, is it not clear to their leaders where this trajectory is leading them and us—and at what rate? Who in the next generation will be able to finance these combined populations at the current level?

Whatever the validity of these kinds of concerns about fertility differentials and the relative contribution to society of different of different sub-populations, the point of this essay is that caution is due before *ecological* arguments can be legitimately added to the concerns about the faster–growing portions of Israeli society. Environmental analysts must put out the

message: Battle high population growth rates on political, economic, family health, social, or geo–strategic grounds, if you will; but think twice before you clothe these concerns as environmental imperatives.

Some conclusions and recommendations

By way of conclusion, I propose the following rough contours of a responsible approach to the "population" issue in Israel. (In fact, one main message of this essay is that "population" should not be raised as an isolated issue, but considered as part of the complex social–technical demographic realities that lead to rising environmental impacts.) These interlocked guidelines are offered as a starting point for further development and debate.

The current unsustainability of Israel's environmental impacts, and their projected rise in a business–as–usual scenario must be analyzed and squarely faced.

While some argue that Israel is muddling towards sustainability, or at least toward a modicum of a sustainable development program,[41] or that Israel's national plans could, in principle, accommodate continued large population growth rates,[42] a strong case can be made that, despite its programmatic declarations, the country is failing to manage the environmental impacts of its current population along many important dimensions.

To the degree that Israel's environmental policy–regulation–enforcement regime is not containing environmental impacts of its *current* population/ consumption levels within tolerable limits, the burden of proof is upon planners and policy–makers to demonstrate how and by how much these impacts will drop, especially in the light of projected increases in both population and per capita consumption levels. Some serious back–casting is needed, which begins with the minimal tolerable future standards in many spheres and works backwards to the steps needed from now onwards in order to reach them. These may contain both population and consumption elements, subject to the qualifications that follow.

Current and projected environmental impacts must not be taken at an aggregate level, but differentiated by the various dimensions of environmental stress (motorization, toxic and solid waste generation, agricultural land conversion, etc.), by which portions of the population contribute to and suffer from these, and by where they occur.

This is important, because some environmental systems are more stressed than others; in some irreversible changes might result from these stresses; in some realms, the technologies of production and consumption seem stable, and population growth will be the main driving factor, while in others changes in lifestyle or economic landscape will be key; in some spheres (some kinds of vehicle emissions), great gains can be made through technological improvements, but not so in others; and so on.

In particular, the consumption/population equation must be explicated in key dimensions of impact; in many of these, the majority of the growth in impact over recent and coming decades is probably due to rises in consumption, not in population size.

This is not to negate the impact of population growth, which can be significant, but only to say that the trade–offs between the two must be considered. What are considered normal Western (i.e. high consumption) lifestyles cannot be entertained even at current population sizes, much less at larger populations. However, the populations that are growing fastest do not, at this point, have such lifestyles. Thus, in the short and medium term, it would be mistaken to lay the onus of lifestyle change primarily at the door of high fertility, rather than high–consumption sub–populations, or to tackle growth trends in one sphere rather than the other. At the same time, populations with high fertility lifestyles should be aware that the relative environmental innocuousness of these is "bought" through very low per capita consumption levels. Pricing that reflects the true (inc. external) costs of consumption would go a long way to conveying both messages.

Population growth stems from immigration, as well as natural growth.

This is important to remember for several reasons. First, as an earlier graph illustrated, the (unlikely) massive waves of immigration, of the kind hoped for by some decision–makers (including Prime Minister Sharon), would lead to doubling times that are truly fantastic, rather than merely worrying. Second, discussion of population management will challenge not only the ideology of large families, but the equally strong ideology of Israel as a refuge for all Jews, and free Jewish immigration. Third, it further diffuses the focus on Haredi and Arab fertility levels: a large portion of recent population growth over the last decade has stemmed from (the immigration of) an entirely different sector.

Decision–makers and opinion leaders must be more aware of the time–lags involved in reversing the demographic and consumption trends currently underway.

Were fertility levels to begin dropping tomorrow, the impacts of the large families of today would still be felt for decades during which the many children in large families reach child–rearing age—even if the number of children they themselves produce are smaller. This impact would be especially large were the lowering of fertility accompanied by rises in consumption among offspring of existing large families. Similarly, were an improved technology or land–use pattern to become "available" today, it would take decades (and in some cases, centuries) before the existing stock of consumptive technologies were abandoned.

Changes in fertility levels in the most high–fertility subpopulations are likely to occur as the result of a range of broader social, cultural, and economic dynamics, and perhaps fairly independently of explicit government attempts to alter fertility.

For example, non–Bedouin non–Jewish fertility dropped quite significantly and steadily from 1940 to 1980, even as Bedouin fertility rose on average over this period. Among Jews, the stark dichotomy between Ashkenazi and Sephardi fertility levels that prevailed until the mid–fifties has been much reduced, while religiosity and nationalism have become more significant factors in fertility levels. These trends occurred without any differentials in the prenatal incentives (such as child subsidies) applied to subgroups, but for a variety of not fully understood historical, cultural, social, and broader economic reasons. Thus, removing subsidies for large families might be both less needed and less effective than it may seem "intuitively."

Fertility levels in the Haredi population, for example, may be more likely to change as a result of internal dynamics than through external manipulation of narrow economic incentives. This is because the relative impact of child subsidies—much less of environmental exhortations—on fertility decision–making may be smaller than the effects of other forces. These include a broader range of pressures faced by a community with a doubling time of 17 years, and changes in the status of women. The internal stresses of the last couple of decades of high Haredi fertility in Israel are just now becoming apparent as this community grapples for the first time with the sometimes crippling burden of providing for the marriage and household establishment of its 8 or 9 offspring. Similarly, the tensions between working outside the home to support a husband devoted to full–time learning, and raising a large family, are being felt by Haredi women. These tensions will be increasingly felt, to the degree that they have the training and opportunities for income that competes with even the generous levels of child subsidy. Child subsidies may modulate these stresses to some degree, but the

amplitude of this modulation (i.e. the effectiveness of subsidies as a policy lever) remains an open question. For this reason…

To the extent that future population growth rates are a target for policy, they are likely to be better approached obliquely, through integrated package of social programs that emphasize augmenting, rather than constraining, the freedoms, choices and opportunities of current generations. In particular, measures that increase the status of women (in general and in particular subgroups) and their reproductive rights and health (such as availability of and freedom to use contraception), are not only inherently valuable, but will tend to make fertility less prone to ideology.

In the words of Agenda 21,

> **[Population policies] should combine environmental concerns and population issues within a holistic view of development whose primary goals include the alleviation of poverty; secure livelihoods; good health; quality of life; improvement of the status and income of women and their access to schooling and professional training, as well as fulfillment of their personal aspirations; and empowerment of individuals and communities.**

Analyses of population issues in Israel must take into account the sensitivities of all sub–populations in Israeli society who have historically been exposed to various kinds of demographic losses or demographic manipulations.

Population policies that seem like a continuation of manipulation for political ends, or that constitute a frontal collision with broadly consensual ideologies, are unlikely to get anywhere, and are not a wise expenditure of environmentalist ethical and political capital. Some equally effective avenues open to environmentalists wishing to reduce future environmental impacts, are pricing consumption at its true (social/environmental) cost, and working for the broad social changes that make demographic warfare a less necessary and appealing option for subpopulations to adopt.

Population analyses must also be scrupulous in ensuring that political agendas do not leak into deliberations under the guise of objective environmental considerations.

I think this essay has shown that the intuitive obviousness with which certain demographic trends or interventions present themselves as environmental solutions can and should be questioned.

[1]

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[4] *Ibid*., Table 1.7.

[5] Per capita emissions are calculated by dividing overall $C0_2$ emissions by population: 4.660 million in 1990 and 6.125 million in 1999.

[6] Israel Ministry of the Environment, *Environmental Indicators in Israel* (2001).

[7] *Statistical Abstract of Israel*, Table 1.7.

[8] Israel Central Bureau of Statistics, http://www.cbs.gov.il.

[9] *Statistical Abstract of Israel – 2000*. Table 6.19.

[10] Israel Electric Corporation, *Statistical Report – 2000*, Table 6.

[11] *Ibid*., Table 10.

[12] *Ibid*., Table 6.

[13] Dr. Ayala Tamari, "Gas for Electricity Production: The Natural Choice," *Yarok Cahol Lavan*, Aug.–Sept. 2000 (in Hebrew). Dr. Tamari served as Head of the Environmental Department of the Israel Infrastructure Ministry (previously the Energy Ministry) from 1987 to 1999.

[14] *Israel Union for Environmental Defense v. Minister of National Infrastructure*, No. 9032/01.

[15] Israel Electric Corporation, *Statistical Report – 2000*, Table 75.

[16] As of 1 January 2000, the price charged to Israeli residential customers was $0.091 per kilowatt hour (KWH), whereas in Japan, the comparable charge was $0.25 per KWH; in Denmark, $0.19 per KWH; in Germany, $0.134 per KWH; and in Spain, $0.117. Source: Israel Electric Corporation, *Statistical Report – 2000*, Table 86.

[17] Israel Electric Corporation table, reprinted in *Haaretz*, 3 July 2001.

[18] P. Glickstern, "Desalination: The Present Situation and Future Possibilities," in Barry Rubin, ed., *Efficient Use of Limited Water Resources* (Begin–Sadat Center, Bar Ilan University, Dec. 2001), p. 16 (in Hebrew).

[19] Total land transport rose from 18.7 billion kilometers in 1990 to 35 billion km. in 1999, with the primary growth occurring in private vehicle travel (12.2 billion km. to 21.7 billion km.). *Statistical Abstract of Israel – 2000*, Table 18.17.

[20] While major shifts in transport infrastructure investments are essential (e.g. introducing urban and inter–urban rail as well as encouraging non–motorized mobility), recommendations on this subject are presented in a separate chapter of this report.

[21] Energy Engineering Center, Faculty of Mechanical Engineering, Technion – Israel Institute of Technology, *Strategy for Removing Lead from Petrol in the State of Israel*, Interim Report #2, Research #034–177 (August 2000), p. 7.

[22] Ginsberg et al., "Mortality from vehicular particulate emissions in Tel Aviv–Jafo," in *World Transport Policy and Practice* 4/2 [1998], 27–31.

[23] This study is a joint undertaking of the U.S. Environmental Protection Agency, Israel's Environment Ministry, and the Israel Union for Environmental Defense. Its results are expected to be released early in 2002. The pollution parameters examined by this study are particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide, sulfur dioxide, and ozone.

[24] *Israel Union for Environmental Defense v. Ministers of Environment, Infrastructure, and Transport, and the Egged and Dan Bus Cooperatives*, No. 3974/00.

[25] *Egged Bus Cooperative v. Ministers of Environment, Infrastructure, Transport, and Industry, and the Israel Union for Environmental Defense*, No. 5208/01.

[26] Faiz et al*., Air Pollution from Motor Vehicles: Standards and Technologies for Controlling Emissions* (World Bank, 1996). Percentages are derived from diesel and petrol price comparisons appearing in Table A3.3.2.

[27] The Tel Aviv by–law, adopted in principle by the City Council in August 2001, is the outcome of a joint campaign of the Council's two–member Green Party faction and the Israel Union for Environmental Defense.

[28] In January 2001, the Israel Union for Environmental Defense filed a Supreme Court petition – still pending – calling on the relevant government agencies to meet their obligations facilitating LPG use by the transport sector. *Israel Union for Environmental Defense v. Ministries of Infrastructure, Transport and Environment*, No. 327/01.

[29] U.S. Environmental Protection Agency, Methyl Bromide Phase Out Web Site, http://www.epa.gov/ozone/mbr/mbrqa.html.

[30] These deadlines, set forth in Adjustments to Article 2H of the Montreal Protocol as agreed at the Ninth Meeting of the Parties in September 1997, are automatically binding on all Parties.

[31] Montreal Protocol, Art. 2H(4) & (5). The phase–out schedule applicable to methyl bromide production directed at meeting "basic domestic needs" in developing nations extends through 1 January 2015. See *Handbook for the International Treaties for the Protection of the Ozone Layer* (Ozone Secretariat, UNEP, Fifth Edition, 2000), pp. 320–21.

[32] Montreal Protocol, Art. 2H(6). As an admittedly crude gauge of the magnitude of methyl bromide use for quarantine and pre–shipment applications globally, it is worth noting that these uses constitute roughly 10 percent of total U.S. consumption of the compound, according to the USEPA. http://www.epa.gov/ozone/mbr/mbrqa.html.

[33] Letter from Efrati, Galili & Co., 6 December 2001, attorneys representing Dead Sea Bromine, in response to a formal query submitted by the Israel Union for Environmental Defense, 14 November 2001.

[34] Israel approved the Montreal Amendment in Government Decision No. 2268, 17 August 2000. However, in a letter to the Government Secretary dated 17 June 2001, Israel's Foreign Minister Shimon Peres announced that the inter–ministerial committee charged with overseeing the Montreal Protocol's implementation had reversed its earlier endorsement of the trade ban, now recommending a freeze on all steps toward ratification of the Amendment.

[1] For a good overview of the issues, see Longerman and Brooks*: "Watershed—The role of fresh water in the Israeli Palestinian conflict*," International Development Research Center (IDRC), 1994.

[2] UK Foreign and Commonwealth Office: "*Water in the Middle East Peace Process*," May 2000.

[3] Israeli–Palestinian Interim Agreement on the West Bank and the Gaza Strip (The Oslo Peace Accord), 1995, Article 12 deals with environmental protection and Article 40 deals with water and sewage.

[4] Nassereddin, Chapter 7 in Feitelson and Haddad, "*Management of Shared Ground Water Resources*," IDRC, 2000.

[5] Israeli water consumption rates are 280–300 liters per person per day while Palestinian rates are 50–80 liters on average. See Kliot, "Environmental Conflicts and Environmental Security—Israeli and Palestinian Perspectives," *Studies in the Geography of Israel*, Vol. 16, 2002 (Forthcoming, Hebrew).

[6] Ibid.

[7] UK Foreign and Commonwealth Office: "*Water in the Middle East Peace Process,*" May 2000.

[8] Palestinian Ministry of Planning and International Cooperation, "*Water and Wastewater Existing Situation, Regional Plan for the West Bank Governorates,*" 1998.

[9] Kliot: "Environmental Conflicts and Environmental Security—Israeli and Palestinian Perspectives," *Studies in the Geography of Israel*, Vol. 16, 2002, (Forthcoming, Hebrew).

[10] Ibid. See also the issue of illegal dumping of Israeli solid wastes in Palestinian Areas in Eyal Artzi, Shadow Report Chapter "Environmentally Sound Management of Solid Waste."

[12] Ibid.

[13] WECUP: "*Regional Peace Initiative*", 2002.

[14] Kliot: "Environmental Conflicts and Environmental Security—Israeli and Palestinian Perspectives", *Studies in the Geography of Israel*, Vol. 16, 2002 (Forthcoming, Hebrew).

[15] Geographical Institute of Israel, "*Concealed Sinkholes Detection in the Dead Sea Area*" May 2000 and *Maariv Newspaper* article, "The Next National Disaster," 22 June, 2001 (Hebrew).

[16] FoEME: "*Let the Dead Sea Live—Concept Document*", 2000.

[17] Philip Warburg, Editor, "*Protecting the Gulf of Aqaba*," Environment Law Institute, 1994.

[18] Atkinson, "*Evaluation of Pollution in the Gulf of Eilat*," Report for Israeli Ministries of Infrastructure, Environment and Agriculture, December, 2001.

[19] Munir Adgham, Chapter 20, in Philip Warburg, Editor, "*Protecting the Gulf of Aqaba*," Environment Law Institute, 1994.

[20] Atkinson, "*Evaluation of Pollution in the Gulf of Eilat*," Report for Israeli Ministries of Infrastructure, Environment and Agriculture, December, 2001.

[21] See David Dunetz, Shadow Report Chapter "Education for a Sustainable Society in Israel" and Yaacov Garb, Shadow Report Chapter, "Population Dynamics and Sustainability in the Israeli Context."

[22] See GreenPeace, *National Profiles Report to Monaco Conference of the Parties, Barcelona Convention*, November 2001, and see, UNEP/MAP website under "Status of Signatures and Ratification" at www.unepmap.org.

[23] For a detailed discussion, see Philip Warburg, Shadow Report Chapter, "Air Pollution, Ozone Depletion and Global Warming."

[24] The UNECE Convention on Access to Information, Public Participation in Decision–making and Access to Justice in Environmental Matters, June 1998.

[25] The Conference of the Parties to the Convention on Biological Diversity adopted a supplementary agreement to the Convention known as the Cartagena Protocol on Biosafety, on 29 January 2000.

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[27]."

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[29].

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[32] If there is any attempt to influence, rather than only predict, demographic trends contained in all these plans, it is implicit in the obsessive attention to the ethnic ratios of populations at national and regional levels—a topic discussed more extensively in the JIIS report.

[33] Some argue that Israeli policies also embody a less ardent but still discernable commitment to reducing Arab population growth.

[34] Roy Beck and Leon Kolaniewicz, "The Environmental Movement's Retreat from Advocating U.S. Population Stabilization (1970–1988): A First Draft of History." Manuscript.

[35] Eran Feitelson (1998), "Muddling Toward Sustainability," *Progress in Planning*, Vol. 49.

[36] Interestingly, the L–shaped curve here still holds when all CBS localities are plotted: it is rare to find high–income high fertility localities.

[37] The modeling is based on a ratio of 2:1 between secular and Haredi consumption (and thus environmental impact) levels. Of course in some spheres (sewage production), the per capita impact will be similar, while in others (per capita car ownership) the ratio will be far higher than 2:1. Further details of the modeling, and the original spreadsheets are available from the author.

[38] Milcia Zarkovic Bookman, *The Demographic Struggle for Power: The Political Economy of Demographic Engineering in the Modern World* (London: Frank Cass, 1970).

[39] Eli Berman (1998), *Sect, Subsidy, and Sacrifice: An Economist's View of Ultra–Orthodox Jews*, The Jerusalem Institute for Israel Studies. Christian and Muslim figures are taken from population registry, whereas others are from labor force survey (LFS), and there is some discrepancy, due to under–sampling of the Muslim population in the LFS.

[40] The figures are drawn by Ben–David from "a report by a committee headed by Dr. Zvi Zameret (director of Yad Ben Zvi) at a recent conference in Herzlia." Dan Ben–David, "Asleep and drifting toward the falls," *Ha'aretz*, March 15, 2002, page B6 in the English edition.

[41] E. Feitelson (1998), "Muddling Toward Sustainability," *Progress in Planning*, Vol. 49, pp. 1–53.

[42] Eran Feitelson (1994), "Allowing for Sustainable Growth Under Drastic Immigration Stress in Israel," *Journal of Environmental Planning and Management*," 37(4), pp. 379–394.