Intensification of Environmental Conflicts Resulting from Rural to Urban Transformation: The Case of Arab Localities in a Changing Galilee

Hussein Tarabeih* Rassem Khamaisi* Deborah F. Shmueli*
University of Haifa

The present study investigates the relationship between atmospheric conditions in Arab society in Israel is a traditional one, undergoing rapid urbanization processes within their communities. This is transformative for both individual and community lifestyles (i.e., changes in demographics, education, economics, agriculture, industry, residential patterns, and expansion of built-up areas), and at the same time creates environmental problems and conflicts. Hazards are emerging and existing environmental problems are worsening impacting land, water, sanitation and animal-husbandry. This paper examines and characterizes the environmental conflicts that develop within Arab localities and in interface zones within which the Arab and Jewish populations converge. Fundamental failures are exposed in planning policy, licensing and enforcement, and lack of an established environmental administrative structure within Arab towns. The intricacies of planning within the localities, disregard of environmental issues, and the failure of local and central government decision makers to recognize that environmental hazards extend across town borders, perpetuate environmentally-unfriendly planning solutions within and adjacent to Arab localities.

Keywords: *Urbanization in Arab Communities, Environmental Conflicts, Environmental Planning and Administration, Land Acquisition, Contact Zones.*

Arab communities in Israel are undergoing a process of rapid urbanization. The population growth within these localities, the expansion of their built up areas, and their socio-economic and geo-political transformation have been documented and analyzed widely, while the environmental aspects of such urbanization within Arab communities and in the areas between them and adjacent Jewish localities have attracted less attention. This paper aims to fill this void with regard to the resulting intensification of environmental problems and conflicts. The weakness of local community awareness and limited ability of the localities to cope with environmental

*Department of Geography and Environment, Haifa University, Haifa, Israel. E-mail: tarabeih@gmail.com

problems are exacerbated by the uneven distribution of land between groups within Arab communities, dating back to post-1948 and inheritance practices.

The paper begins by theoretically framing the rapidly increasing environmental problems resulting from urbanization and the transformation of the Arab localities in Israel. Then the research methodology is set out. A discussion of the findings of existing and emerging environmental problems and conflicts within Arab localities and in the contact zones between them and adjacent Jewish communities is presented and the implications explored. The last section presents conclusions and recommendations.

RAPID URBANIZATION AND ENVIRONMENTAL PROBLEMS

Human advancement involves constant modification of the physical, economic and social environment, as well the development of technologies for solving problems caused by these modifications. Urbanization is now the most common form of settlement in developed and developing countries (Knox and McCarthy, 2005). Due to population growth, economic development and other factors, the documentation of increasing environmental problems in areas with accelerated growth such as Asia (Shin et. al. 1997; Ichimura, 2003; Maiti and Agrawal, 2005) and Africa (Daramola and Ibem, 2010) is evident in the literature. As cities develop, agricultural land is reduced; what were once areas of primary occupations are transformed into secondary and tertiary occupations; densities and costs of land increase; high-rise construction technologies are adopted; and transportation infrastructures are developed within and between urban centers, metropolises, and peripheries, due to commuting and suburbanization processes. Furthermore, cities require service systems – e.g., sanitation, healthcare, education, and welfare – which, in societies that have not internalized the intensity of the change, are ill prepared to manage population growth.

This rapid urbanization results in increased pressures and competition over land use; the need for development and expansion of occupational, industrial and energy resources; construction of additional waste and sewage management infrastructure and facilities; allocation of land for public uses; and over-exploitation of natural resources, open spaces and water and mineral resources (Mazor, 1993; Laster and Choshen, 2003, Orenstein and Hamburg, 2009).

Israel, a densely-populated country particularly north of Beer Sheva, utilizes its land, water, natural and landscape resources to the fullest extent. Due to the shortage of land within the ecumene, the country permits the encroachment of intensive land uses onto agricultural land and open space (Mazor, 1993; Frenkel, 2004), thereby increasing the potential for environmental conflicts, especially in zones of accelerated development (Kaplan, 2001) where rapid land use transitions have

characterized urban development within and around localities in recent decades (Orenstein and Hamburg, 2009; Issac, and Ghanyem, 2001; Sofer and Gal, 1995).

Many environmental conflicts stem from actions aimed at improving economic and social conditions. Often the benefits gained by developers may negatively offset the quality of life and the environmental settings experienced by the broader public. In some cases, environmental degradation negatively impacts public health (Bellenger and Herlihy, 2009). Any change that introduces a new and unknown factor to the environment (e.g., cellular antennas, high-voltage power lines, and military or engineering facilities) results in public concern regarding the cumulative effect of an unremitting environmental risk. Those who have been harmed cannot be fully compensated by removing the hazard after its negative environmental and health impact has been proven; at best compensation for the loss of property value, health care costs, and at times even loss of life will be offered, and is likely to prove inadequate (Napier, 1998; Feitelson, 1996; Vaughan and Siefert, 1992).

Rural communities, such as many Arab localities in Israel, are undergoing a transformation from an agriculturally-based to an industrially and service-based economy (Champion and Hugo 2004; Khamaisi, 2005; Pauleit, et. al., 2010). Due to family and social ties most Arab villagers are not immigrating to Arab cities and due to politics and majority-minority relations, they are not immigrating to mixed Jewish-Arab cities, but rather "importing" the city into their communities (Ghanem et al, 2000; Falah, 1989). Population growth in these Arab localities is the result of high natural increase rates (about 3% per year); this growth is accompanied by increasing consumption rates, market size and purchasing power. Although the community's functions are altered, the population aims to maintain the communal-social fabric intact (Khamaisi, 1993). Many localities undergo urbanization without changing their municipal status from locality to city (Khamaisi, 2004b). In these cases, they develop a form of "in-situ urbanization" that is characterized primarily by the introduction of urban functions into the rural space (Khamaisi, 2005; Brodnitz, 1986; Kipnis, 1976). In other cases, when towns grow large enough to qualify for city status, they develop an 'urban-village' pattern familiar in developing countries. This pattern gives rise to contradictory land uses, life styles and cultural, commercial, industrial, and residential patterns, which undermine the social and economic cohesiveness of the communities (Kleniewski, 1997).

Arab society in Israel is exposed to a unique array of environmental challenges that are due to the sector's political and economic status as a minority within the State. Prior to the establishment of the State of Israel in 1948, Arabs owned approximately 95% of the land known as Palestine[1]. Today, Arab citizens of Israel constitute approximately 18% of the total population,[2] and own about 3.5% of the total land area.[3] The shrinking of Arab territory and land, the strengthening of the urbanization process and transfer of the economic base within Arab communities to non-agricultural activities contribute to the emerging environmental problems presented below.

This complex in-situ urbanization or 'urban-village' mosaic, inevitably sharpens the conflicts among diverse elements of the population. The increase in intra-locality traffic, resulting largely from the entry of non-agricultural occupations, causes conflicts between non-agricultural and agricultural classes. Such conflicts arise from environmental hazards and nuisances such as untreated waste and sewage, noise generation, unpleasant odors, pests, and physical deterioration (Khamaisi, 2004a).

Due to urbanization, lack of out-migration, high birth rates, increasing standards of living, and geographically-constricted jurisdictions, Arab municipalities require additional land for residential and commercial development, public institutions, infrastructure systems, and public parks (Yiftachel, 2000; Ozacky-Lazar and Ghanem, 2003; Khamaisi, 2011). There is increasing pressure for construction and infrastructure development along roads. Projects routinely invade open space, often without planning or taking into account future plans, safety and environmental considerations, the natural landscape, heritage or cultural values. Increased construction and infrastructure, especially along the roads, generate a wide range of environmental conflicts within the Arab localities and in the contact zones between the Arab and Jewish communities, generating numerous complaints from Arab and Jewish residents (Sofer and Gal, 1995; Towns Association for Environmental Quality – Agan Beit Natufa, 2006).

Environmental conflicts that develop within and around Arab towns are further intensified by the Jewish-Arab geopolitical dispute: governmental policy perpetuating division between Arab and Jewish populations (Khamaisi, 2004a), and the belief within the Arab community that most of their land that was seized after the establishment of the State has been used for development in the Jewish sector (Rouhana, 1997; Hoffman, 1982; Yiftachel, 1995; Yiftachel, 2000; Shmueli, 2008; Tarabeih, 2008). Many of the environmental challenges in the Israeli Arab community can also be considered within the framework of environmental justice (Lubnov, 2006; Shmueli, 2008). The next section presents a typology of environmental conflicts within and around Arab localities in Israel.

EMERGENCE OF ENVIRONMENTAL CONFLICTS

Spatial development of Arab villages in Israel/Palestine historically (and even as late as the 1990s) has followed a pattern of private land expanding in sections from a center in concentric circles. This spatial pattern of expansion does not occur as a result of municipal planning, but rather from individual initiatives to construct additional family residences and to expand commercial and agricultural endeavors. The aggregation of individual building initiatives creates an urban disorganization that poses challenges to creating infrastructures for public services including drinking water, sewer-system drainage, trash collection, and transportation services. The patchwork of various land uses also created, and continues to create, problems char-

acteristic of traditional societies--problems that grow in complexity as populations grow (Tarabeih, 2008). These problems are then compounded when the villages and towns seek to expand beyond their municipal boundaries. Most villages do not contain publically owned land, and when they evolve into small cities, local governments are unable to secure additional land for public facilities and infrastructure.

Cultural Differences

The settlements undergoing urbanization contain rural-familial elements such as the familial estate courtyard, and agricultural elements such as orchards, vegetable gardens, hen houses, cowsheds, and sheepfolds. Within these elements, occupational characteristics of the older and younger generations collide due to higher educational achievements of the younger generation. On the inter-generational axis, the younger generation's aspirations for progress and change oppose the older generation's desire to retain traditional settings. The older generation's preferences are for stove chimneys, traditional charcoal-heated ovens (taboons), private septic systems, limited public areas, and animal husbandry; members of the younger generation do not widely share these preferences. Furthermore, the older generation would view the takeover of agricultural lands by commercial, residential and industrial uses as an insult to their heritage (Khamaisi, 2007). On the socio-cultural level, as Arab localities experience this rural-urban transformation, many of their residents continue to cling to traditional rural values. These values accept mixed rural and urban land uses, thereby creating barriers to dealing with the environmental problems that are caused by such mixing. Private land interests supersede the public ones in this traditional value system, thereby leading to a limited interest in transferring environmental polluting activities from their current locations within residential neighborhoods, to facilities in public spaces that can more easily address environmental hazards and pollution.

Economic Changes

Recent years have seen a transformation in the economic means of production in Arab localities in Israel, similar to the experience of moshavim and kibbutzim in the Jewish sector. The number of non-agricultural jobs has increased while agriculture-related employment has decreased. Urbanization is also impacting those areas that remain rural; the spread of environmental hazards and nuisances in rural areas is often due to semi-industrial activities and in increased private and commercial vehicle traffic. Hazards and nuisances attract the local population's attention and are a source of conflict and public outcry (Sofer and Gal, 1995, Shalev et al., 2000).

Administrative Issues

Municipalities are one of the governing bodies responsible for maintaining and improving local quality of life. Despite the anticipated benefits of decentralization and privatization (recommended by the central government), the central government has not provided the fiscal tools for achieving these goals. Improving the efficiency of public services by privatization and decentralization involves employee layoffs - a complex procedure that can have a "boomerang effect" for the head of the municipality who fires employees. In this respect, the Arab sector is no different than the Jewish sector, except that the familial nature of the Arab sector causes elected representatives to have a strong sense of commitment to their extended family (Hamula) members who may happen to be public employees. As long as the familial pole is more influential than professional or political pressure, non-professionals are appointed to local enforcement and regulation. When local officials lack professional training or have no commitment to any environmental agenda, the authorities' activity in the sphere of environmental regulation and planning is not effective (Khamaisi, 2007).

Before the establishment of the Ministry of Environment in 1989, town associations and municipal environmental quality agencies managed and implemented environmental programs under the Ministry of Interior. However, these environmental management programs did not include municipalities in the Arab sector. The absence of environmental management in the Arab sector manifested itself in the disregard of environmental impacts in the sector's planning processes. There are many examples[4] of infrastructure projects that were approved without meeting basic environmental conditions that are requisite according to national planning and building laws, including industrial areas or environmental projects (Tarabeih, 2008). The Israeli government acknowledged, in 1993, that environmental progress in the Arab sector was behind that of the Jewish sector. Yossi Sarid, the Minister of the Environment at the time, delivered the following statement to the Knesset (Israeli Parliament) during Environmental Quality Week: "The Ministry of Environment is now emphasizing an increase in its activity in the Arab sector. For years, the topic of environmental quality has been neglected in this sector, at the levels of environmental administration, environmental infrastructure and public awareness of this topic…" (Sarid, 1993). This statement marked the beginning of environmental intervention in the Arab sector, starting with the establishment of seven regional environmental-quality units and town associations.

The subsequent establishment of environmental units in certain regions of the Arab sector, including the Sachnin Valley, Beit Hakerem Valley, Nazareth, the Northern and Southern Triangle, Carmel Ridge, Jat, Yanuh and Kesra Smea; Tamra and Shfaram; Rahat; and others, has promoted awareness of environmental issues among decision-makers in Arab towns that had previously been neglected. A substantial proportion of environmental problems, however, have yet to be resolved due to the lack of funding, approved plans, and updated by-laws. Many development

projects in the Arab sector continue to occur without consideration of environmental impacts.

Another factor affecting the ability of government authorities on all levels to mitigate the growing environmental threats within Arab communities and in the contact zones is related to the patterns of land ownership and the wider geopolitical context. With the founding of the State of Israel in 1948, the policy of land expropriation and the restriction of Arab development have affected land plot size and distribution among Arab's still maintaining land ownership. Many of the plots, due to inheritance practices where land is divided among many descendants, are too small for environmental or other infrastructure development, and make the negotiation process among multiple land owners onerous. Land expropriation was accompanied by other discriminatory policies which have created a great disparity between Arab and Jewish towns not only in land area, but also education, health, and environmental budgets (www.mossawacenter.org). In the interface (contact) zones, the general Israeli governmental policy is to exclude Arabs from sharing and managing public space. This exclusion reduces the interest and the involvement of Arabs to deal with the public space where environmental problems exist. Moreover, since central government controls land use allocation and planning and most of the funding to combat environmental hazards, local government has limited resources to deal with internal and cross-boundary environmental problems. Additionally, in the north the Israeli policy of 'Judaising the Galilee' and accelerating the urbanization of Arab localities (a policy of increased densities as opposed to allocation of additional lands) in order to ensure that more land is available for Jewish settlement, adds to the Arab lack of confidence in governmental environmental control regulations and programs.

Arab municipalities are plagued by problems that further exacerbate their environmental concerns. Poor availability and low quality of environmental infrastructure negatively affects the ability of the industrial and commercial sectors to meet environmental standards. Arab municipalities that try to allocate land beyond their jurisdiction for uses such as industry, occupation, leisure, animal husbandry and environmental infrastructure are often unable to successfully negotiate with Jewish authorities that control most of the land surrounding the Arab towns. Thus, the towns are becoming increasingly dense with a wide range of incompatible uses. For example, there are multiple examples of industries operating without business licenses, small factories and livestock farms located within residential areas, and sewage and waste-treatment infrastructure constructed without permits or environmental impact studies (Shenhar and Tarabeih, 2003; Tarabeih, 2008). The Arab sector also lacks pollution-reducing or efficient technology, and lacks the public awareness needed to demand the mitigation of harmful environmental impacts. Environmental hazards originating within Arab localities affect neighboring Jewish municipalities, which can create friction between the Arab and Jewish populations. Due to geopolitics and the struggle over land between Arab and Jewish communi-

ties, associated environmental conflicts threatens potential for coexistence of the two societies (Tarabeih, 2008). The complexity of the official planning system is another cause of delays for authorizing land use plans in areas defined as highly sensitive environmentally, such as the Galilee region. The development gap between Arab and Jewish municipalities, and the transfer of some factories to Arab communities (NIMBY), further add to environmental problems and conflicts.

STUDY METHODOLOGY

We analyzed the rapid urbanization and development processes in Arab towns in Israel by examining the extent of business activities; types of nuisances; and the extent to which business activities cause environmental conflicts. The analysis included approximately 120 businesses and factories and approximately 150 livestock farms. The study region is located in the central Galilee of northern Israel (see Figure 1). There are five Arab towns in the study region: Sachnin, Arrabe, Dier Hanna, Eilaboun and Bu'ayna Nujeidat. These five towns have a total jurisdiction of approximately 38,900 dunams (9,600 acres) and a total population of approximately 67,700 residents in 2009 (CBS, 2010). They are still in the early stages of accelerated urbanization; they are partially rural and partially urban, and can serve as models for the changes that are occurring in Arab towns throughout Israel. Table 1 presents indicators of rural to urban transformation. These are reflected by trends towards smaller families, higher educational levels, an increase of women in the workforce, lower housing densities and increased vehicle ownership.

Figure 1: The jurisdictional boundaries of the study localities

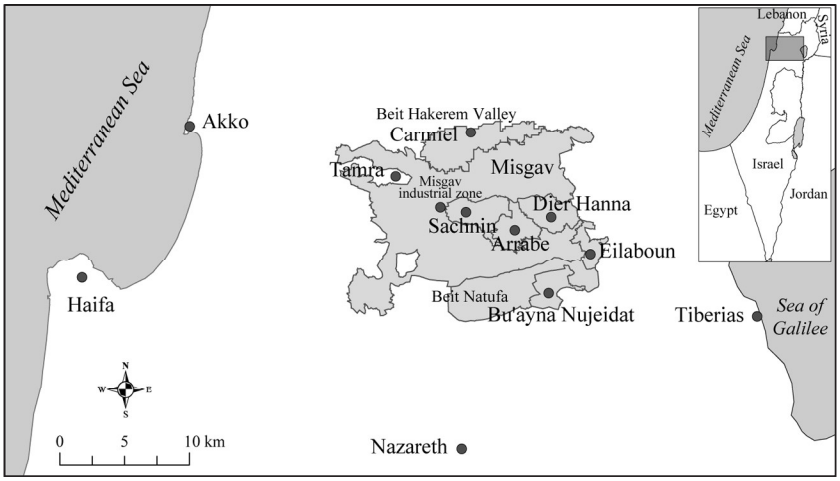


Table 1: Indicators of Rural–Urban Transformation between 1972-2008 in the Study Localities

Localities	Sachnin		Arrabe		Dier Hanna		Bu'ayna Nujeidat		Eilaboun	
Year	1972	2008	1972	2008	1972	2008	1972	2008	1972	2008
Population (thousands)	8.5	25.1	6,3	20.6	2.8	8.7	1.5	7.8	1.6	4.8
% of 0-19 year olds	65.6	45.4	66.4	50.0	65.5	45.5	68.1	50.6	59.6	37.8
Average number of children per woman	5.8	3.0	5.6	3.1	5.5	2.9	5.5	3.1	6.5	2.5
% of population over 18 who have not attended school	44.1	6.8	42.9	5.7	39.7	2.9	45.5	5.6	28.8	14.6
% of population with an academic degree	0.4	10.4	0.7	13.5	0.0	16.7	0.0	7.9	0.0	23.8
% of women in the workforce	2.5	7.8	3.0	10.4	2.5	10.7	1.5	6.1	4.0	19.3
Average number of persons per household	7.1	4.1	7.6	4.5	6.4	4.2	6.9	4.6	6.4	3.7
Housing density (persons per room)	3.6	1.2	3.5	1.3	3.4	1.2	3.0	1.2	2.7	1.1
% of households with one or more private car	5.2	58.8	2.5	58.6	11.4	67.4	4.7	62.0	5.9	68.0

Source: CBS, 2010a, gathered from 2008 census findings.

The study classified levels of hazard generation and complaints of residents on a scale of 1 to 5, where '1' indicates a very low level of environmental nuisance and risk generation or filing of complaints, and '5' indicates a very high level of risks and hazards generated by the businesses and a very large number of complaints. Data concerning business activities was gathered primarily from governmental offices, particularly from the following: 1) municipal departments of Sanitation, Business Licensing, Planning and Engineering, and Regulation and Public Complaints; 2) Departments of Planning and Business Licensing and Industry and Infrastructure of the Towns Association for Environmental Quality (TAEQ) - Agan Beit Natufa[5]; 3) the Ministry of Environmental Protection; and 4) the Lev Hagalil (Central Galilee) and Galil Mizrahi (Eastern Galilee) Planning and Building Committees.

In addition to data collection, the study included:

- Mapping operating businesses and factories and assessing the extent to which they met legal environmental requirements.
- Identifying and assessing environmental hazards and conflicts within the Arab towns and in the contact zones where Arab and Jewish communities converge, through observations.
- Identifying and characterizing bodies involved in environmental conflicts, e.g., municipal and governmental authorities, environmental units, private parties, organizations and officials.
- Interviewing experts and officials.
- Comparing actual land use patterns with zoning designated by statutory plans.

The findings were classified and compared with data from surveys that were conducted by the TAEQ- Agan Beit Natufa for the preparation of various master plans, as well as with data from the scientific literature (Yom Tov, 1984; Kalik and Tarabeih, 1998; Shenhar and Tarabeih, 2003).

THE EFFECT OF URBANIZATION PROCESSES ON THE CREATION OF ENVIRONMENTAL HAZARDS AND CONFLICTS

The data analysis reveals the types of conflicts that exist in the study region, their extent, the parties involved, and the different stakeholders affected by each conflict. Table 2 summarizes the types of businesses and factories that were analyzed, their level of environmental hazard/conflict generation, the number of complaints of residents or other stakeholders and their assessment of severity:

Table 2: Severity of Hazards by Business Type and Number of Complaints Received

Business type (total: 123 businesses)	Hazards generated (1=slight, 5=severe)					Number of complaints
	1	2	3	4	5	
Garages	0	0	9	15	3	3
Carpentry	0	0	2	24	2	3
Wood Storage	0	0	3	8	2	3
Tire Repair	0	1	5	5	2	3
Bakeries	0	3	10	0	0	3
Stone Cutting	0	0	0	1	8	5
Flour Mills	0	0	0	2	0	1
Aluminum Processing	0	1	3	7	2	3
Welding and Locksmith	0	0	0	9	8	5
Construction and Building Materials Dealers	0	0	2	4	5	1
Oil Presses	1	2	1	6	5	1
Block Production	0	0	0	3	3	3
Concrete Production	0	0	0	0	3	3
Iron Production	0	0	0	4	0	1
Gas Reservoirs	0	0	0	3	3	1
Auto Paint and Auto Body Repairs	0	0	3	3	3	1
Auto Electric Repairs	0	0	7	5	1	1
Slaughterhouses	0	0	1	12	10	3
Total	1	7	46	11	58	45

The findings in Table 2 indicate that approximately 60% of the businesses and factories generate severe hazards at levels 4-5 (high-very high), and approximately 36% of the businesses and factories are responsible for level 3 (intermediate) nuisances. Approximately 36% of complaints are about businesses and factories; residents or neighboring businesses file the complaints claiming that they are negatively affected by the activity of a certain facility. The situation is ripe for the development and/or escalation of conflict within the towns due to environmental hazards and nuisances.

Only about 15% of the businesses and factories are located in an official industrial zone, the rest being scattered amongst residential areas. The only industrial zone in the study region is located in Sachnin, and only approximately 30% of Sachnin's businesses operate within this zone. Other Arab towns in the study area do not have designated industrial zones. Approximately 85% of the businesses and factories are located in proximity to sensitive and conflicting land uses, i.e., in residential neighborhoods or along roads within and between the towns. These complaints are based on the environmental problems that result from new land uses and urban service needs and create considerable socio-cultural tensions and conflict between neighbors, including those who belong to the same kinship or extended family.

To analyze the change in types and extent of environmental problems during the evolving urbanization process a comparison of results from four surveys (two undertaken in the mid-1980's and two since 2003 (2003 and 2008)) revealed the types of environmental nuisances and hazards that were characteristic of the towns' rural and urban periods (Yom Tov, 1984; Arraf, 1985, Kalik and Tarabeih, 1998; Shenhar and Tarabeih, 2003). The data comparison shows an approximately 30% increase in the quantity of businesses and financial activities within the towns over the past ten years. The businesses and factories found in the towns are almost entirely in the fields of construction, workshops and low technology industries, and rarely in advanced high-tech industries.

In addition to the environmental hazards described in Table 3, the survey included records of environmental hazards and nuisances handled by the municipal Departments of Sanitation, Business Licensing and Planning and Engineering. The survey revealed new types of environmental hazards, some of which have caused conflicts between neighbors within residential neighborhoods or conflicts between individuals and municipalities or businesses within the towns.

Intra-neighborhood Environmental Conflicts (within Arab towns)

Internal environmental conflicts fall within the following categories:

- Conflicts between neighbors regarding the positioning of cellular antennas on residential homes in the neighborhoods due to fear of radiation and cancer. These types of disputes can become violent, as reported by residents of Eilaboun, Arrabe, and Tamra (outside the study area), where conflicts over antenna location have resulted in incidents ranging from property damage to murder.
- Conflicts between residents and municipalities and/or the Israel Electric Company regarding high-voltage power lines due to fear of health damage from electromagnetic radiation.
- Conflicts regarding garbage cans of businesses and residents that have not maintained proper hygienic standards resulting in olfactory nuisances, pests, deterioration of physical appearance, etc.
- Conflicts regarding initiatives by municipalities or residents to pave access roads, which result in loss of land and environmental nuisances such as engine noise,

Table 3: Environmental Hazards: Rural versus Urban Phases

Hazards in Arab towns	Description during rural phase (Yom Tov, 1984; Arraf, 1985)	Description during urbanization phase (Shenhar and Tarabeih, 2003; Tarabeih, 2008)
Chimneys in residences	• End at roof height • Smoke enters homes causing respiratory problems • Effects not recognized or understood by residents	• Wood stoves replaced by gas, kerosene or diesel oil stoves • Adjusted chimney heights have reduced the pollution • New problem of fuel and gas storage • Slow return to wood stoves as nostalgic "rural" fashion
Traditional ovens (taboons)	• Abundant in all villages • Smoke contains high concentrations of CO; spreads throughout villages in mornings and rest days.	• Most of the residents have stopped preparing bread at home • Replaced by wood- or gas-heated baking ovens • Still several complaints about taboons
Drainage	• No drainage system • Slops (rinse and wash water – not sewage) pours out to the yards or to public places	• Many areas without proper drainage system. • Causes olfactory and mosquito nuisances • Illegal use of sewers causes disputes with the municipality since treatment facilities cannot handle the excess flow, particularly during the winter months
Vegetation	• Private yards lack vegetation • Some private yards used to grow small amounts of vegetables	• Few orchards, characteristic of rural houses • Private vegetation replaced by concrete and asphalt yards • Vegetation starting to be planted again, but far less than in Jewish towns • Lack of public gardening maintenance
Green areas and public parks	• Public parks and squares absent or neglected	• Shortage of open public spaces • Municipalities and local planning committees often do not consider urban open spaces important • Land ownership and lack of awareness contribute to shortage
Waste	• Remnants of food and other types of waste commonly found in streets and yards • Piles of waste found outside the towns	• Serious problem of dumping waste within towns • Recent funding from the Ministry of Environmental Protection for stopping dumping has not been effective due to poor enforcement by local authorities
Olive vegetable water (oil press waste)	• Olive vegetable water disposed from oil presses as part of the processing of olives into olive oil • Reduces the quality of water and soil	• Ministry of Environmental Protection is partially funding technologies that prevent the passage of raw vegetable water to the central sewer system • The number of oil presses has increased due to the phenomena of expanding agricultural lands and planting olive trees after "Land Day in 1976"

drainage problems, uprooting of old olive trees, etc.

- Conflicts regarding the connection of homes to different types of infrastructure (e.g., central sewer systems, water pipes, electric-power supply, telephone lines). When lines/pipes cross private plots, conflicts often erupt.
- Conflicts regarding planning processes conducted without public participation which result in mixed land uses and establishment of hazard-generating businesses (e.g., marble factories, welding and locksmith workshops, cowsheds, sheepfolds, carpentry workshops) into residential areas without business permits or licenses. This creates environmental nuisances and hazards that affect the neighbors. Additionally, the construction of industrial zones, town markets, and waste and sewage treatment facilities often occur without planning and consideration of the potential environmental impact.
- Conflicts regarding social events, e.g., noise from speakers in outdoor weddings and other events late at night, and the use of fireworks during weddings, soccer games and other events.
- Conflicts concerning the shortage of parks, green areas and community gardens in the neighborhoods.
- Conflicts regarding the shortage of infrastructure and lack of waste management, which result in the creation of illegal waste sites in sensitive locations and disputes between different stakeholders.

Environmental Conflicts in Contact or Interface Zones Between the Arab and Jewish Populations

A substantial proportion of environmental conflicts between Arab and Jewish communities in Israel are intensified by the lack of available land for development of public infrastructure. In most cases there is no open public land within the jurisdiction of Arab towns; the only available developed land is within the jurisdiction of Jewish municipalities and controlled by semi-governmental bodies. Since the conflict often revolves around control over land, these conflicts are in the domain of geopolitical and majority-minority conflicts such as has happened in Carmiel, Hadera and Ra'anana (Bracha, 2008a; Bracha 2008b; Rada, 2007; Supreme Court Ruling 8676/00). Typically the Arab side is represented by individuals, as opposed to the Jewish side, represented by municipalities, regional councils, the Israel Land Administration, planning and building committees, the JNF (Jewish National Fund), the Nature and Parks Authority (NPA) and other bodies.

A major root of environmental conflict in contact zones is the perception by Arab stakeholders of under-allotment of land to Arab communities and over-allotment of land to Jewish communities. The Israeli government has expropriated considerable amounts of Arab-controlled land for nature reserves, national parks, and archeological sites. Regulatory bodies have also imposed limits on uses of private lands, which many Arab land-owners view as a restriction on their freedom (see cases in Beit

Jann, Ir HaKarmel (Carmel City), the Tzalmon Stream, Sachnin, and Kocharav) (Tarabeih, 2008).

In general, Arab municipalities experience severe shortages of public and open land that hinders their abilities to provide recreational areas, public gardens, and infrastructure; it is also increasingly difficult to meet local demand for land dedicated to animal husbandry, homes, and commercial or industrial development. Arab towns face great difficulties in negotiating joint industrial zones with Jewish communities. One such example is the Misgav industrial zone. Here, Misgav created an industrial zone that includes agricultural land privately owned by Arab residents of Sachnin (Sachnin Municipality, 2006; Shmueli, 2008).

Another perceived inequality of access to natural resources is the low water quota allocation by the government for irrigation and agricultural development in the Arab sector. Although there is potential for irrigation with purified water from Arab towns, insufficient funding for sewer and waste treatment infrastructure has resulted in poor wastewater management, deterioration of general water quality, and increased involvement of residents in struggles to rectify the situation (see cases of the Arrabe-Sachnin sewage transfer station and the wastewater pipe between Sachnin valley towns and Carmiel (Towns Association Agan Beit Natufa, 2005-2006).

Animal Farms Within Towns as a Potential Source of Environmental Conflicts

According to the Ministry of Environment, local enforcement departments receive a relatively large number of complaints related to animal farms and agricultural/traditional occupations within urbanized areas. (Ministry of Environment, 2006). Interviews with representatives from the Ministry of Environmental Protection and the Ministry of Agriculture, municipal leaders, planners, farmers, representatives of farmers' associations, and stakeholders revealed that although livestock farms are still a primary source of occupation for certain populations, the farms are a source of many environmental nuisances and conflicts within the towns. Farmers understand the problems and expressed willingness to cooperate in order to resolve them and avoid their negative impact upon the residents. At the same time, farmers were not confident that authorities would agree to prompt equitable solutions. The regional councils, planning authorities and environmental bodies are often unwilling to compromise and allocate additional land for animal husbandry outside of urbanized areas, which would reduce land pressure and environmental conflicts in the towns.

According to Table 4 approximately 70% of the farms surveyed in the study region were constructed without building permits and operate without business licenses. Approximately 44% of these farms cause severe environmental nuisances and hazards, and 25% generate moderate environmental hazards and nuisances. A significant proportion of the farms constitute a nuisance for residents, businesses, schools and other stakeholders.

Table 4: Summary of the Animal Farms in the Towns and their Environmental and Statutory Status (October 2007)

Town	Number of farms	Without Construction permits	With Construction permits	Level of envir. hazards/ nuisances		
				High	Medium	Low
Sachnin	38			14	9	15
Arrabe	45	22	23	21	17	7
Dier Hanna	19	11	8	5	2	9
Eilaboun	25	25	-	11	5	4
Bu'ayna Nujeidat	24	20	4	16	4	4
Total	151	107	44	67	37	47

The process of allocating land suitable for livestock rearing began in 1995. However, regional councils and the JNF have objected to the allocation of land to solve environmental problems in the Arab sector. Relevant government ministries such as the Ministry of Agriculture and the Ministry of Environmental Protection are aware of the problem, although they have taken no effective action to implement solutions (Shenhar and Tarabeih, 2007).

We have described three types of hazards – those that derive from common infrastructure – impact activities, those that are rooted in agricultural activities within built-up areas, and those that relate to the location of industrial activities. The environmental hazards that are produced by rural-urban transformations in the Arab localities have led to a wide debate over the possible solutions. One solution calls for creating increased public space for industrial and service activities, and increased support to local authorities to deal with such environmental issues as collection of garbage, waste and sewerage problems. The Arab community is becoming more aware of environmental hazards, and the number of environmental NGO's working in the Arab localities to cope with the environmental problems and hazards has increased. With respect to separation of land uses local authorities have begun to work on pushing out the polluting activities such as handcraft industries, dairies and other farm activities. These authorities and planning committees, with support from the Agricultural and Environmental Protection Ministries, have prepared master and detailed plans to concentrate the dairies and animal farms from Arrabe, Deer Hanna and Tamra. Regarding handcraft industries, local authorities are intensively engaged in assisting owners to move from residences to industrial or handcraft zones (Khamaisi, 2010). In addition, the communities have begun to protest against locating cellular antennas or polluting sources within residential neighborhoods.

There is considerable public discourse over the need for more public space and for sharing it with neighboring communities including Jewish localities.

THE NEXUS BETWEEN URBANIZATION AND ENVIRONMENTAL DETERIORATION

Internal and external processes influence the development of environmental conflicts within Arab localities and between them and the adjacent Jewish localities. The internal processes are related to accelerated urbanization and traditional social and cultural tendencies. With living standards rising in Arab localities, current public services are not meeting the needs of residents. The external processes result from systemic institutional discrimination and exclusion from decision making processes. More specifically, Arabs are excluded from land use planning and land management. There are also insufficient financial resources allocated to local municipalities (Jabareen and Law Yone, 1998; Hasson and Abu-Asbah, 2004; Ghanem and Dichter, 2003; Ghanem et al, 2000; Ozacky-*Lazar* and Ghanem, 2003).

These internal and external processes result in widening economic and social gaps between the Arab and Jewish sectors with regard to development and growth (Yiftachel et al, 2000; Khamaisi, 2004a). As a consequence their surroundings are exposed to conflict-generating forces that impair the quality of life for both sectors in Israel in general and specifically in the Galilee region (Luz, 2007).

CONCLUSIONS

Israel's Arab population continues to face environmental hazards within a geopolitical context and ongoing imbalances in programmatic support and government funding. Challenges surrounding governmental structure and resource allocation, rapid urbanization, and majority-minority relationships intensify the environmental conflicts experienced by Arab towns. The impact on land development can be seen in the extensive infrastructure construction, expansion of the built-up area of the towns, and increased business and economic activities. The process is occurring without environmental planning, which results in a mixture of incompatible land uses. The fact that businesses and factories do not meet environmental standards, along with the lack of sufficient enforcement of existing environmental regulations, generates environmental nuisances and hazards for residents and other stakeholders. Many of these environmental problems only began to surface in the 1990s. Accordingly, they are new and unique to Arab society causing a new category of conflicts within the towns.

For the most part, there is insufficient infrastructure capacity to meet the constantly growing needs within Arab towns in Israel. Increasing population and con-

struction pressures result in extensive loss of open space and spillover construction outside approved town jurisdictions. To a certain extent, the demand for additional land for construction outside Arab town jurisdiction is based on traditional construction patterns and the land ownership structure.

Municipalities have not completed the construction of industrial zones that began approximately 20 years ago, although there remains significant unmet demand for such zones. This was the case for example in the communities of Sachnin, Tamra, Arrabe, and Shfaram. As a result, many municipalities come to feel helpless with respect to what transpires in their jurisdiction, unable to provide viable solutions or answers to residents' environmental concerns. The result is increased potential for intra-settlement and regional environmental and political conflicts involving Arab localities.

In summary, the geopolitical Arab-Jewish conflict affects planning and environmental conflicts in the Arab towns; Israeli Arabs are marginalized socially, economically, politically and geographically, and cultural differences between the two peoples foster conflicts about regional planning and environmental quality. Expropriation of private land for public purposes is particularly problematic for the Arab community because of historical, cultural, and economic factors. All these factors make planning and urbanization in Arab towns in Israel extremely complex.

Municipalities have attempted to work around these challenges by resorting to planning tools that are more expensive and less suitable than newer alternatives, such as 'Environmental Sulha', adapted from the traditional social "Sulha" (reconciliation). The results involve high private and public costs, numerous planning and environmental conflicts, and low rates of compliance with environmental regulations. These obstacles to sustainable development found in Arab towns do not occur as frequently in the Jewish sector (Tarabeih, 2008).

To reduce and manage environmental conflicts, stakeholders share a common responsibility. All citizens deserve healthy lives free of environmental hazards, and the municipalities and relevant authorities must act in order to rectify policies that have perpetuated the schism between the quality of lives of Arab and Jewish populations. From the perspective of environmental justice, it is imperative to empower local environmental management in the Arab sector through legislation, increased environmental awareness and enforcement, new culturally adapted mediation tools and incorporation of environmental assessments into the planning of any development project. At a minimum, Israeli ministries that bear the responsibility for allocating suitable land for development must enable the completion of the infrastructure necessary to reverse environmental degradation in Arab towns and prevent the creation of future environmental risks. This will have positive implications beyond the immediate quality of life for Israeli Arab communities.

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NOTES

1. Excluding what is now the Occupied Palestinian Territory or West Bank, and Gaza.
2. Report of the Israeli Central Bureau of Statistics, 2010 (using 2008 data).
3. 93% of the land in Israel is public, administered by the Israel Lands Authority; 3.5% are lands owned by Arab landowners and 3.5% are owned by Jewish landowners.
4. For instance, waste treatment facilities for Sakhnin, Arrabe and Dier Hanna and the Sakhnin industrial zone.
5. The Towns Association for Environmental Quality- Agan Beit Natufa (TAEQ) was established as a first regional TAEQ in the Arab sector in Israel in 1993.

REFERENCES

Arraf, S. (1985) *Al-qarya al-arabiya al-falastiniya* [The Palestinian Arab Village] Jerusalem, Israel: Arab Studies Society (Arabic)

Bellenger, J. M. and Herlihy, T. A. (2009) An Economic Approach to Environmental Indices. *Ecological Economics*, 68 (8-9), 2216-2223.

Bracha, A. 2008(a) Practical Implementation of Environmental Justice. Ma'asei Mishpat, Tel Aviv University *Journal of Law and Social Change*, Vol. A, 179-189. (Hebrew)

_____ . 2008(b) Public Spaces Open Closed. *Mikarkain* (Land), Vol. 7 (5): 28-38. (Hebrew)

Brodnitz, M. (1986) The Suburbanization of Arab Settlements in Israel. *Horizons in Geography* 17-18: 105-124. (Hebrew)

Central Bureau of Statistics (CBS) (2010) *Statistical Abstract of Israel*, No. 61, Jerusalem: Central Bureau of Statistics.

_____ . (2010) *Census 2008 result, profile of localities*, Jerusalem: Central Bureau of Statistic. http://www.cbs.gov.il/census/census/pnimi_sub_page.html?id_topic=11&id_subtopic=1

Champion, T. and Hugo G. (eds.) (2004) *New Forms of Urbanization, Beyond the Urban-Rural Dichotomy*, Farnham, UK: Ashgate,

Daramola, A. and Ibem, E. O. (2010), Urban Environmental Problems in Nigeria: Implications for Sustainable Development, *Journal of Sustainable Development in Africa*, 12(1): 124-145.

Falah, G. (1989) Israeli 'Judaization' Policy in the Galilee and its Impact on Local Arab Urbanization. *Political Geography*, 8(3): 229-253.

Feitelson, E. (1996) *Model of the Development of Environmental Conflicts in Metropolitan Areas and its Implications for Planning.* Jerusalem: The Jerusalem Institute for Israel Studies. (Hebrew)

Frenkel, A. (2004) The Potential Effect of National Growth-management Policy on Urban Sprawl and the Depletion of Open Spaces and Farmland. *Land Use Policy* 21: 357–369.

Ghanem, A., Abu-Ras, T. and Z. Rosenhek, (2000) New Directions for Government Policy towards the Arab Population in Israel. In Rabinowitz, D., Ghanem, A. and Yiftachel, O. (eds.) *An Emergency Report by an Inter-university Research Team, After the Rift* submitted to Ehud Barak, Prime Minister of Israel. (Hebrew)

Ghanem, A. and Dichter, S. (eds.) (2003) 'The Sikkuy Report-the Association for the Advancement of Civil Equality in Israel', Jerusalem, Israel. (Hebrew)

Hasson, S. and Abu-Asbah, K. (eds.) (2004) *Jews and Arabs in Israel Facing a Changing Reality: Dilemmas, Trends, Scenarios and Recommendations.* Jerusalem: Floersheimer Institute for Policy Studies. (Hebrew)

Hoffman, J.E. (1982) Social Identity and the Readiness for Social Relations between Jews and Arabs in Israel. *Human Relations*, 35: 727-741.

Ichimura, M. (2003) Urbanization, Urban Environment and Land Use: Challenges and Opportunities, Asia-Pacific Forum for Environment and Development Expert Meeting, 23, January 2003, Issue Paper.

Isaac, J. and Ghanyem, M. (2001) *Environmental Degradation and the Israeli Palestinian Conflict.* Jerusalem: The Applied Research Institute.

Jabareen, Y. and Law-Yone, Y. (1998) *Planning the Arab Towns in Israel: The Case of Land Allocations for Public Purpose.* Haifa: The Center for City and Regional Studies, Technion-Israel Institute of Technology. (Hebrew)

Kalik, Y., and Tarabeih, H. (1998) *An Environmental Master Plan for the Sachnin Valley Localities.* Sachnin, Israel: Towns Association for Environmental Quality (TAEQ), Agan Beit Natufa. (Hebrew)

Kaplan, M. (2001) *The Distribution of Land in Israel.* Jerusalem: Israel Land Administration, Department of Planning and Development. (Hebrew)

Khamaisi, R. (1993) *From Restrictive Planning to Development Planning in Arab*

Localities in Israel. Jerusalem: The Floersheimer Institute for Policy Studies. (Hebrew)

_____ . (2004a) Environmental Spatial Policies and Control of Arab Localities' Development. In Schoenfeld, S. (ed.) *Palestinian and Israeli Environmental Narratives.* Toronto: York Centre for International and Security Studies, York University, 185-202.

_____ . (2004b) Urbanization without Cities: The Urban Phenomena among the Arabs in Israel. In Maos, J.O., Inbar, M. and Shmueli, D.F. (eds.) *Contemporary Israeli Geography, Special Issue of Horizons in Geography,* 60-6: 141-50 (Haifa, Israel: University of Haifa).

_____ .(2005) 'Urbanization in Arab Localities in Israel. *Horizons in Geography,* 64-65: 293-310. (Hebrew)

_____ . (2007) *Between Customs and Laws: Planning and Management of Land in Arab Localities in Israel.* Jerusalem: Floersheimer Institute for Policy Studies. (Hebrew).

_____ .(2010) *Establishing Headquarters for Industrial Zones in Arab Localities.* Small Business Development Center (MATE), Nazareth. (Hebrew)

_____ . (ed.) (2011) A*rab Society in Israel: Population, Society and Economy*, Vol.4, Van Lear Jerusalem Institute/Hakibbutz Hameuchad Publication House. (Hebrew)

Kipnis, B. (1976) Trends of the minority population in the Galilee and their planning implications. *Ir ve-Ezor* (City and Region), 3: 54-68. (Hebrew)

Kleniewski, N. (1997) *Cities, Change, and Conflict, A Political Economy of Urban Life,* Belmont, California: Wadsworth Publishing Company.

Knox, L. P. and McCarthy, L. (2005) *Urbanization: An Introduction to Urban Geography.* 2nd Edition, New Jersey: Pearson Prentice Hall.

Laster, R. and Choshen, E. (2003) *Environment, Administration and Law in Israel.* Jerusalem: The Jerusalem Institute for Israel Studies, the Center for Environmental Policy. (Hebrew)

Lubnov, K. (2006) *Report on Environmental Inequity, Health, Environment and Society.* Tel Aviv: Life and Environment, Umbrella Organization of the Environmental Organizations in Israel. (Hebrew)

Luz, N. (2007) *On Land and Planning Majority-Minority Narrative in Israel: The Misgav-Sachnin Conflict as Parable.* Jerusalem: Floersheimer Institute for Policy Studies. (Hebrew).

Maiti, S. and Agrawal, K. P. (2005), Environmental Degradation in the Context of Growing Urbanization: A Focus on the Metropolitan Cities of India. *Journal of Human Ecology,* 17 (4): 277-287.

Mazor, A. (1993) *Land Resources in Spatial Planning.* In *A Master plan for Israel in the 21st century.* Haifa: Technion-Israel Institute of Technology, pp. 129-212. (Hebrew)

Ministry of Environment (2006) *Annual Report, 2006.* Jerusalem: Ministry of Environment. (Hebrew)

Napier, C. (ed.) (1998) *Environmental Conflict Resolution.* London: Cameron May Ltd.

Orenstein D. E. and Hamburg, S.P. (2009) To Populate or Preserve? Evolving political-demographic and environmental paradigms in Israeli land-use policy. *Land Use Policy,* 26: 984–1000

Ozacky-Lazar, S. and Ghanem, A. (eds.) (2003) *The Orr testimonies: Seven Professional Opinions Submitted to the Orr Committee.* Jerusalem: Keter Publishing House Ltd. (Hebrew)

Rada, M. (2007) Heads of Municipalities: Continue to collect ad missions fees to parks", YNET, 28.08.07, http://www.ynet.co.il/articles/0,7340, L-3442946,00.html, Hebrew.

Pauleit, S., Breuste, J., Qureshi S. and Sauerwein, M. (2010) Transformation of Rural-Urban Cultural Landscapes in Europe: Integrating approaches from ecological, socio-economic and planning perspectives. *Landscape Online*; http://www.landscapeonline.de/archive/2010/20/Pauleit_etal_LO20_2010.pdf

Rouhana, N. (1997) *Palestinian Citizens in an Ethnic Jewish State: Identities and Conflict.* New Haven, CT: Yale University Press.

Sachnin Municipality, 2006, department of engineering archive.

Sarid, Y. (1993) Review by the Minister of Environment in the Knesset. Brochure Submitted to Knesset members. (Hebrew)

Shalev, M., Sa'di, A., and Schnell, Y. (2000) Development and Employment. In Rabinowitz, D., Ghanem, A. and Yiftachel, O. (eds.) *An Emergency Report by an Inter-university Research Team, After the Rift.* submitted to Ehud Barak, Prime Minister of Israel. (Hebrew)

Shenhar, H. and Tarabeih, H. (2003) A *Master Plan for the Sachnin Valley Localities. Eilaboun.* Israel: The Arab Center for Alternative Planning. (Hebrew)

_____ .(2007) *A Master Plan for Animal Farming in the Sachnin Valley.* Sachnin, Israel: Towns Association for Environmental Quality (TAEQ), Agan Beit Natufa, Galilee, Israel. (Hebrew).

Shin, E., Hufschmidt, L, Lee, Y. Nickum, J.E. Umestu, C. and Gregory, R.(1997), *Valuating the Economic Impact of Urban Environmental Problems; Asian Cities.* UNDP/UNCHS (Habitat)/World Bank; Urban Management and Poverty Reduction, working paper no.13.

Shmueli, D., (2008) Environmental Justice in the Israeli Context. *Environment and Planning A,* 40(10): 2384-2401.

Sofer, M. and Gal, R. (1995) Environmental Implications of the Entrance of Non-Agricultural Businesses into the Moshavim. *Horizons in Geography,* 42-43: 39-50. (Hebrew)

Supreme Court Ruling (Begat) 8676/00, Adam Teva V'Din versus Ra'anana. (Hebrew)

Tarabeih, H. (2008) *The Management and Resolution of Environmental Conflicts in Split Societies: Towards the Formation of a Culturally Adapted Model: Case Analyses of Conflicts in the Galilee.* PhD thesis, Haifa: Department of Geography and Environmental Studies, University of Haifa. (Hebrew)

Towns Association for Environmental Quality (TAEQ) (2006), Agan Beit Natufa, Annual Report, 2005-2006.

_____ . (2005) *Agan Beit Natufa. A Survey of Businesses in the Sachnin Valley Localities.* Sachnin, Israel: Planning and Business Licensing Department. (Hebrew)

_____ . (2006) Agan Beit Natufa. Regulation and Public Complaints Department, Sachnin, Israel. (Hebrew)

Vaughan, E., and Siefert, M. (1992) Variability in the Framing of Risk Issues. *Journal of Social Issues* 48(4): 119-135.

Yiftachel, O. (1995) Arab-Jewish Relations in Israel: Policy, Disparities, and Political Geographical Implications. *Medina, Mimshal VeYachasim Benleumiyim* (State, Government and International Relations), 40: 185-224. (Hebrew)

Yiftachel, O. (2000) L*and, Planning and Inequality: The Division of Space between Jews and Arabs in Israel.* Tel Aviv, Israel: Adva Center. (Hebrew)

Yiftachel, O., Khamaisi, R. and Kedar, S. (2000) Land and Planning. In Rabinowitz, D., Ghanem, A. Yiftachel, O. (eds.) *An Emergency Report by an Inter-university Research Team, After the Rift.* Submitted to Ehud Barak, Prime Minister of Israel. (Hebrew)

Yom Tov, S. (1984) *Cultural Inhibitions in the Advancement of Physical Planning in Arab Villages in the Galilee.* PhD thesis, Jerusalem: The Hebrew University of Jerusalem.. (Hebrew)