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Poverty, education and employment among the Arab-Bedouin society: A comparative view*

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Abstract

The socio-economic situation of the Arab-Bedouin population in the Negev is examined in light of the general Israeli Arab population. Based on the Galilee Society's social survey for 2004 Israeli Arab poverty incidence was found to be 52% with nearly two thirds in persistent poverty. Among Bedouins in villages unrecognized by the Israeli government it was nearly 80% with poverty severity about 7 times higher than that of the mainstream Jewish population in Israel, i.e. excluding the – predominantly poor – Jewish ultra-orthodox society. Poverty was calculated according to various definitions.

Similarly to international evidence, we found that education, age, family size, employment and occupation of the household head and the number of income earners in the family are important determinants of the probability to be poor.

Arab women's student enrollment rates over different generations improved considerably, reducing the education-gap compared to Arab men. Bedouin households, especially in non-recognized villages, were found to have much less access to infrastructure compared to other Arabs, thus forming a significant barrier to women's participation in the labor force. This also had an adverse indirect effect toward the completion of schooling, thus keeping mothers' fertility relatively high and reducing education's potentially diminishing effect on poverty. A considerable mismatch between skills and employment was found among Arab academics, thus hinting at discrimination and segregation in their labor market. Considering the various mentioned transmission mechanisms it seems that government intervention in infrastructure may yield a high social return and help interrupt the vicious circle of poverty.

Keywords: Bedouin, Ethnic groups, Israel, poverty, basic needs, relative poverty, food-energy-intake, infrastructure, fertility, education, school-dropout, employment.
JEL Classification: H54, I21, I32, J13, O12, O15, O18.

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A Introduction

The purpose of this paper is to describe the socio-economic situation of the Arab-Bedouin society of the Negev on the background of the general Arab society in Israel. We use a unique database of the Galilee Society (henceforth GS) that for the first time enables to view characteristics of Bedouin villages which are not recognized by the government, as well as Central Bureau of Statistics data (henceforth CBS).

The way of life in the Arab-Bedouin society is undergoing accelerated change from a traditional agrarian society into a modern society. This change partly expresses the desire of youths in a traditional society to adapt to Western surroundings, and in part reflects a policy induced by the government. Following the uprooting of Bedouin villages after the war of 1948 from the North-Western region of the Negev to its North-Eastern region, a traumatic and complicated land dispute arose between the Bedouin and the State, which has led the State to turn its back on the most basic infrastructure required for the Bedouin such as water, electricity, education, sewage, garbage disposal, road systems, transportation, and employment infrastructure. Even in the few cases in which the government conceded to recognize a 'non-recognized' village within its existing borders (e.g. Um-Batin in 2004) and develop infrastructure therein, the process became entangled, among other things, in the thicket of conflicting interests within the Arab-Bedouin community. Hence, the inferior economic situation, which manifests in extremely high poverty incidence, is a combined result dictated by the dispute with the State, and intensified by tensions within the Arab-Bedouin society. This state of affairs impedes social development in that region and prevents any significant private investments in it.

Past efforts to resolve the problems between Bedouin and government have failed. The confidence of the Bedouin in the government's ability to provide adequate public services is at a low. The government is frustrated with efforts to enforce building-laws over the land in dispute. This perpetual deadlock has led to recurring episodes of makeshift houses being built by Bedouin and to be demolished rapidly thereafter by the State, while no incentive, meaningful enough, is being created for Bedouin of the non-recognized villages to relocate into permanent communities recognized by the government. Among the Bedouin, this situation deepened the social deterioration and caused ever increasing alienation towards the state. This failure spells loss for both

parties to the dispute: it enhances the social and economic distress of the Bedouin population, while government sovereignty over territories in dispute is weakened. This predicament is deplorable for the Bedouin and for Israeli society in general.

An attempt has been made in 2006 to mediate between the relevant agents with the assistance of the American Consensus Building Institute.[2] This initiative was designed as a pilot aimed at outlining a solution to the dispute and to the adversity in the villages Kuseife and Um-Batin, in the hope that a successful process may create a model for a cooperative solution to the problem. Another plan, called "Southward" ("Daroma" in Hebrew), aimed at developing the Negev, which is led by private Israeli investors, may favorably influence the entire Negev, including the situation of the Bedouin of the South, although according to Swirski (2007), the benefit for the Bedouin is not obvious. Usually, a process of urbanization is expected to reduce poverty. Indeed, the urbanization of the Bedouin in the seven recognized communities brought with it a system of basic services that includes a road system, schools, clinics, and water systems, but the level of services remained significantly inferior to that provided in Jewish communities of similar size. The provision of public services is complicated by the combined responsibility of the central and local government. The recognized Bedouin communities are rated at the bottom of the socio-economic scale published annually by the CBS.

One might expect that urbanization would create a wider array of employment opportunities than the traditional occupations, and that it would raise the rate of employment among Arab-Bedouin. Such a process did not happen on a large scale, as may be seen from the low rates of participation in the labor force, particularly of women and also of men (8.7 and 55.4% respectively in 2004). The lack of adequate infrastructure, particularly of public transportation within Arab communities in general, within Bedouin communities in particular, and between them and Jewish communities that offer employment potential, also explains the low rates of participation of these population groups in the labor force.

[2] See the Conflict Evaluation Report (2006) of the CBI Institute, which is allied with the universities of Harvard and MIT. The preliminary report by the Institute focused on outlining the positions of groups of interested parties concerning the villages of Kuseife and Um-Batin. Delegates of the Bedouin public in both villages, of the government, and of additional interest groups were required to return a questionnaire concerning the main points of controversy, the problems that require attention, and their expectations with regard to possible solutions.

More than half of the Arabs live in poverty. The same data include not only the population of recognized Bedouin communities, but that of the non-recognized villages as well, records of which the CBS does not collect. The GS database enables research into the living conditions of the various Arab communities and allows for distinguishing between competing concepts of poverty.

In the literature on poverty there is an ongoing discussion concerning alternative approaches to measuring poverty.[3] Some authors distinguish between the absolute and the relative approach to poverty measurement, but one might wish to distinguish between the approach of basic needs, which encompasses both the absolute (i.e. anchored) approach with a basket in the base year, updated only by the relevant price increase, and relative approaches, focusing on the basic needs as reflected in consumer expenditure survey data. This includes for example the Food Energy Intake and Share approach (FES), the National Research Council approach (NRC, also referred to as National Academy of Science, NAS, the Market Basket Measure approach, MBM, which are described in section C). The main, more common use of the relative approach is typically based on the median income, and sometimes on the average income. In Israel, similarly to many advanced countries and the OECD, the half-median income approach is used as the official poverty measure.[4] Still another group of relative indices are based on approaches of social deprivation and social exclusion. These indices relate to various indicators of the living standard in a relevant social environment. They might be based on subjective poverty perception. Many of them evolved around A.K. Sen's capabilities approach (Sen, 1985), which views poverty in a multi-dimensional setting, rather than being restricted only to the analysis of (pecuniary) income and consumption data.[5]

In light of the above, this paper describes the socio-economic situation of the Arab-Bedouin society on the background of the socio-economic situation of general Arab society in Israel, while focusing on poverty under various definitions, especially in the non-recognized villages, the conditions of which have been neglected in official poverty accounts. In section B we briefly review the historical background of the

[3] See Ehrenpreis, 2006, for an exhaustive and non-technical review. For aspects particularly relevant to the discussion for the situation in Israel see also Chapter 2 of the reports of the National Insurance Institute in recent years, and Chapter 8 of the Bank of Israel Report in years 2005 and 2006.

[4] See www.btl.gov.il/English%20Homepage/Publications/Poverty_Report and http://www.btl.gov.il/English%20Homepage/Publications/Annual%20Surveys%5CPages/skira%202007.aspx

[5] See for example: Deutsch and Silber, 2006.

land-dispute between the Bedouin and the State. In section C, poverty is analyzed under various approaches to poverty measurement. In section D we present an empirical analysis of the main determinants of poverty in the Arab-Israeli society. The article is summed up by concluding remarks.

B Historical background

Before the establishment of the State of Israel the Bedouin population of the Negev counted, according to various estimates, 65,000 to 100,000 individuals. The absolute majority settled in the fertile North-Western region of the Negev (Falah, 1989). Most Bedouin residents in this region fled or were expulsed during the war of 1948. Some became refugees in Gaza, the West Bank, or in neighboring Arab countries. According to various estimates, 11,000 to 17,000 individuals (Porat, 1998) remained in Israel. Most of the remaining Bedouin were uprooted from their living area in the Negev's North-West and relocated to its North-East region, referred to as 'the border area', also mentioned as 'Siyagh' or 'Sayej'. These residents joined the tribes that used to live in this region before the establishment of the State and formed the basis of the non-recognized villages. According to Swirski and Hasson, 2006, this area spreads over 1.2 to 1.5 million dunam, of which about 400 thousand dunam were arable at the time, about a fifth of the arable land that the Bedouin cultivated before 1948. Porat (2000) estimates the area at two million dunam, while Ghazi Falah (quoted in Porat, 1998) estimated the area at 2.7 million dunam. Thereafter, the Western region was expropriated under the Absentee Property Law of 1950, and the region was declared a closed military area from which the Bedouin were restricted. Bedouin residents were consequently prevented from living and making use of the land outside the 'Border Area'. Until the termination of military rule in 1966, Bedouin, like the rest of the Israeli-Arab population, needed a special permit to move outside the area designated for them, for work, study or any other purpose.[6]

In 1953 the "Land Acquisition Law – Confirmation of Actions and Compensations" came into effect. Under that law compensation is due to anyone whose land is expropriated by the State. Expropriated lands were transferred to a government development authority and from it to the possession of the State's Settling Authority.

[6] See Porat, 2000, Ben David, 1996, and Yiftachel, 2004.

Further along, parts of their lands were expropriated in the 'Border Area' for the purpose of establishing seven Bedouin settlements and for general development purposes (including Jewish communities and defense projects).

The Supreme Court (Civil Appeal 218/74) ruled in 1984 that the Negev is State land, and thus on the basis of the Lands Ordinance from the year 1858, installed by the Ottoman regime, and the following British Ordinance concerning the same topic.[7] Bedouin land claimants relied on the rules of tradition and did not care to obtain title deeds from Ottoman or British authorities, inter alia, due to apprehension of having to pay taxes. In 1962 a government committee recommended the establishment of permanent communities for Bedouin over an area of 7,600 dunam in the Border Area. In 1965 the government approved three sites on which to establish the communities – close to Beer Sheva, Shoval, and Kuseife. The first community, Tel Sheva, was established in 1969, Rahat in 1971, Segev Shalom in 1979. Ar'ara and Kuseife were established in 1982, Lakiya and Hura in the second half of the 1980's. These communities were designed without consulting the Bedouin residents or accounting for their special needs. Al-Huzayel (2004) argues that the purpose of the mentioned government decisions was to take control of Bedouin lands while restricting the area for Bedouin to the smallest possible area of 'Border Area' lands. A survey made in 2001 by Abu-Saad and Lithwick in communities recognized by the State, indicated discontent with urban living conditions there, and distrust by residents toward the government and its conduct in relation to the land dispute.

Alongside the effort to settle the Bedouin in urban communities, the government tried to exercise its formal title by evicting the Bedouin from the lands and relocating them to the aforesaid communities in return for compensation to the families. For that purpose the government created a mechanism for land settlement. The Bedouin who asserted title in lands were requested to file a claim and then sign a waiver in respect of the land being claimed in return for compensation by the State. Those who did not assert title and conceded to relocation to one of the communities, the State offered a plot of land. In 1969 the Ministry of Justice had set a mechanism for land settlement

[7] The Ottoman Ordinance regarded uncultivated lands as "dead" lands ("Mawwat" in Arabic). The Ordinance prescribed that one who cultivates lands can register them in one's name, while the State retains the principal title. In 1921 the British Mandate government published a Lands Ordinance based on the Ottoman Lands Ordinance. The British Ordinance allowed people who cultivate "Mawwat Lands" to register the lands in their name. One who did not register the lands lost his right to the title. See citation of Granovski in Svirski and Hasson, (in Hebrew) 2005.

under which anyone who asserts title in land may file a claim with the land settlement officer.[8] 3,000 title claims were filed, asserting title over 991 thousand dunam, most during the 1970's. The government had since reached settlements in respect of 140 thousand dunam. Hence, the process remains incomplete for an estimated 850 thousand dunam, due to disagreement over the rate of compensation and living conditions in the recognized communities, which some of the Bedouin regard as an unsuitable alternative to their living conditions in the non-recognized villages, and due to the denial of a traditional way of life, including traditional sources of income, and the lack of any employment infrastructure in the recognized communities.

The refusal of many Bedouin land claimants to accept stipulations made in the government's offer has led to the enactment of a law which was intended to force a settlement upon those who thus far refused the offers.[9] In Tel Malhata (Tel almalh), the "Peace Law" was later effected in slightly improved conditions.[10] Due to continued uncertainty from the government's point of view, it froze most areas of public policy and infrastructure investment. This led to a lack of clarity toward the future and as a consequence prevented also private initiative and investment in these places. Even in cases where approved urban planning schemes existed, they were not implemented in many cases, sometimes also due to conflicts within the Arab-Bedouin society concerning title and use of lands by other Bedouin residents.

In 1986 The Administration for the Promotion of Bedouin ("The Bedouin Administration") was established as part of the Israel Land Administration in purpose of negotiating with Bedouin residents who filed title claims in respect of lands. Notwithstanding, the administration defines its functions in a much broader sense: planning and development in existing Bedouin communities, and planning of new communities pursuant to government decisions, allotment of land for agriculture and building of public establishments, settling of agreements for relocating Bedouin from non-recognized communities to recognized ones, administration of the Committee for the Allocation of Drinking Water etc.. The multitude of functions in the hands of the Administration has created a situation, according to which various government offices

[8] The State Comptroller, 2002, p. 115.
[9] Government resolution No. 179 [BD/1] dated November 18, 1979.
[10] Its formal name is the "Acquisition of Land in The Negev Law – The Peace Treaty with Egypt, 5740 – 1980". Under this law, people who claimed lands in an extent of up to 100 dunam were offered to vacate and relocate to a developed plot in Kuseife or Ar'ara, or alternatively be awarded full financial compensation.

parted with their responsibility to attend to residents in the ministries' designated areas of responsibility, given the Bedouin Administration's extensive assumption of responsibility over the fate of Bedouin residents, in all relevant aspects of public policy.[11] Yet the Administration finds it difficult to handle the many functions needed in the Bedouin communities, particularly in light of the ambiguity concerning its powers. The Administration is subject to three bodies at any given time – the Israel Land Administration, the Ministerial Committee for the Coordination of Policy and Operation in the Bedouin Sector, and the Ministry of National Infrastructure. The upshot is that in many areas of public policy the residents do not receive adequate services and the Administration neither has the vocational skills nor the resources required in order to provide adequate services.

In 2004, the Arab population in Israel counted about 1,030,100 - 82% Muslims, 9% Christian, and the remaining 9% included Druze and other groups (Table 1). A fifth of the Muslim Arabs were Bedouin. Most of them (70.3%, including the Bedouin of the North) lived in recognized communities and in the South 59%.

Table 1: The Arab population in Israel by groups, in 2004[1]

Population group	Persons	In % of total Arab population
Total Arab population	1,030,100	100.0
Muslims (in total)	847,967	82.3
Bedouin (in total)	180,146	17.5
Bedouin of the South	131,819	12.8
In recognized communities	78,404	7.6
In non-recognized communities	53,415	5.2
Other Muslims	667,821	64.8
Christians	91,403	8.9
Druze and others	90,729	8.8

[1]excludes East Jerusalem and the Golan Heights.
Source of data: the Galilee Society, 2004.

[11] See document by the Director of the Southern District of the Ministry of the Interior, Dudu Cohen, in 2002. "The reality of the Administration for the Promotion of the Bedouin […], the Authority for Bedouin Education, the Welfare Department for the Bedouin in the Dispersion […] create a sentiment among the Bedouin of being an aberrant population […] which is not entitled to receive direct and professional service from the various government offices, as applied to the Jewish population […]. The Bedouin Administration could (and perhaps should) handle but a single area specific to the Bedouin sector, which is the area of title claims and land settlements. […] the question is posed whether its organizational emplacement should be with the Israel Land Administration, the Ministry of Justice or the Ministry of Finance…" [Quoted from Swirski and Hasson, (in Hebrew) 2005, p. 16].

C Poverty in the Arab society, with attention to the Arab-Bedouin society

The socio-economic situation of the Arab population is difficult: the rate of unemployment is high, the employment ratio, as a share of the population at working age, is low, and dropout rates of children and youngsters from the education system is substantial. This and other factors described below cause severe and persistent poverty, particularly in non-recognized villages. Poverty severity, as measured by Sen's Poverty-Index, deepened over the years. In 2004 their poverty incidence was 79.2% (for persons), and for sake of comparison, the Sen Poverty-Index was 6.7 times that of the Israeli mainstream (Jewish non-orthodox) population.[12]

c.1 Various approaches to measuring poverty

There is considerable professional consensus concerning the methods of aggregation and identification of the poor.[13] Poverty measures are often distinguished by reference to an absolute or a relative approach, typically on the basis of income or consumption expenditure, and more recently, drawing on multiple variables, reflecting a multidimensional approach. The most common poverty line for advanced countries is that of half-median income, as done for example by Israel's National Insurance Institute (henceforth NII). The expenditure-based poverty line is often defined as a basket of expenditure on basic needs. This can be done in an absolute or a relative fashion. In the absolute approach the basket is anchored in a given base year and then updated each year only by the increase in prices. Such poverty measures suffer from arbitrariness concerning the choice of the base year and they become increasingly anachronistic with the time distance of the base year.[14] Poverty lines of relative basic

[12] We have selected the non-orthodox Jewish society as a reference group since poverty in the orthodox population is a singular phenomenon that requires separate reference. See also Gottlieb (2007).

[13] The issue of aggregation relates to the calculation of an index on the basis of specific information regarding poverty in households or individuals. The simplest aggregation method is to count the poor. This index, though widely used, ignores differences in the severity of poverty among families. In the professional literature various aggregation methods account for poverty severity such as the Sen-Index, its extention by Shorrocks (1995), the quadratic income-gap measure by Foster, Greer, and Thorbecke (1984) or the Watts Index (1968) to name but a few. The issue of identification deals with questions of "what is poverty" and "who is poor". The discussion about poverty lines relates to the first question while the discussion of income sources relates to the second. See also Sen and Foster, 1997, or Ravallion, 1994.

[14] Thus, for example, year 1959 was selected to be the base year of the American anchored (absolute) index ("The Orshanski Index"). In Israel, such an absolute index is calculated by the Bank of Israel. It

needs baskets are set each year on the basis of the current relevant survey. Examples for this approach are the Canadian Market Basket Measure (MBM), the American National Academy of Science's basket (NAC) and the increasingly used Food Energy Intake and Share Indices (FEI or FES) as described in Ravallion (1993,1994, 1998) and extensively discussed below. We leave out important other relative indices of social deprivation or social exclusion for future research, despite their attractiveness for poverty research.[15] They refer to various indicators of the living standard in a relevant social environment. Some of them are based on the approach of subjective poverty perception. Much of this literature has developed out of A.K. Sen's capabilities approach (Sen, 1985) into the implementation of multi-dimensional indices.[16]

In this paper poverty indices are calculated on the basis of the relative approach of the widely accepted half-median equivalent net financial income, practiced inter alia, by the NII[17] and on several definitions of the basic needs approach. The relative basic needs approach is presented here by two alternatives – the first is the NRC/MBM approach, combining principles of the National Academy of Science's Research Council (NAS) and of the MBM initiated by the Canadian Ministry of Human Resources (MBM). An important difference between the FES and the NRC or MBM approach is the former's reference to consumption data only, whereas the NRC and MBM approaches identify poor households by comparing basic needs to some definition of disposable income.[18]

A central difference between the current methods of basic needs and other relative methods such as the half- median income is in the extent of adjustment to the current standard of living. In the relative versions of basic consumption expenditure the extent of adjustment is significantly lower than in the relative income based approaches.[19]

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is based on year 1997, for the arbitrary reason of this being the first year in which surveys of incomes and expenditures were unified.

[15] See for example Townsend, 1962, Desai and Shah, 1988 or Saunders, 2003.

[16] See Deutsch and Silber, 2006.

[17] Equivalent income refers to the economies of scale ("savings") in expenditures per individual with the increase in family size. Such economies of scale are mainly due to the indivisibility of capital that can be enjoyed by more than one person without infringing the use by other household members, such as the use of the kitchen by all family members etc.

[18] The NAS approach is thoroughly discussed in Citro and Michael, 1995. The MBM is described in Human Resources Development Canada, 2003. For a discussion concerning the principles for calculating the FES and its use in many countries around the globe, see Ravallion (1993, 1994, 1998) and international comparisons in Anker, 2006.

[19] See chart 4B in GM.

c.1.a The relative approach

Calculations of the relative approach are based on the definition of the poverty line as half the median financial equivalent income, as calculated by the NII.[20] Application of the official poverty line to the data of the Galilee Society enables for the first time to assess poverty among the entire Arab population in Israel i.e. including Bedouin in non-recognized villages.[21] Alongside the advantages of being simple to measure and easy to compare internationally, the official NII relative financial measure suffers from the fact that income in kind, such as that derived from the family residing in its own home and caring for its small children by the spouse that stays at home, is ignored and creates an upward bias of poverty incidence. Another type of income in kind, not accounted for in this definition, refers to the benefits in kind that form part of government policy.[22] While all pros and cons of the various types of poverty measurement need to be weighed against each other it is clear that this difficulty narrows the sensitivity of the relative financial income poverty index to government policy aimed at reducing poverty, a fact that reduces its attractiveness as an indicator for an anti-poverty target.

c.1.b The relative methods of basic needs[23]

The NRC approach: the poverty line is set according to the 30th to the 35th percentile of two main product groups – food and non-food.[24] The non-food component is made

[20] The poverty line of the NII is set on the basis of half the median net financial income. The equivalence scale is based on the weight attributed to expenses on food in the family income, and it presumes less economies of scale than that of the OECD. Hence, the dimensions of poverty, especially in population groups with large families, such as in the Arab and Jewish-Orthodox societies, are higher according to the Israeli equivalence scale.

[21] Notice that since the CBS does not compile data regarding Bedouin in non-recognized villages (see below), it is reasonable to assume that the poverty line of half the median income in Israel would have turned out to be lower, had this population been included in the official calculation. Given the fact that most of this neglected population is extremely poor (see below) this would probably still raise poverty incidence for Israel.

[22] In theory such income is easy to include in the basic needs approach, but in practice such information is not available in Israel unlike in the US where there is a special survey for such information. As we shall see below, the Galilee Society has dedicated much effort to this issue pertaining to accessibility to infrastructures (SIPP, Survey of income and program participation).

[23] We do not present the absolute approach given the arbitrariness of its anchored living standard.

[24] The selection of percentiles 30 to 35 was made by the NRC committee, among other things, in reliance on family-budget research by Renwick and Bergmann (1993), which found expenses in these percentiles to represent about 80% of the median expenditure. Tests regarding the American economy

up of accommodation, clothing, footwear, and an increment of miscellaneous personal expenses and expenses for transportation, which are approximated by a small multiplier. The NRC committee avoided the inclusion of medical expenses and expenses for education in the poverty line.[25] Gottlieb and Manor, 2005, (henceforth GM) included the average of out-of-pocket expense on health, not covered by health insurance. The sources of income addressing the question of "who is poor" include all incomes i.e. in contrast to the half- median approach, which typically restricts itself to net monetary income, the NRC/MBM also includes income in kind.[26] In order to calculate the net income disposable for the purchase of the basic basket, the share of private basic expenses on health is deducted from the total income derived from all sources, if they deviate in excess of the average private expense on health.[27] The cost of going out to work for couples with small children, where both spouses work (or of working single parent mothers), is also deducted in order to distinguish the poverty situation in families of this type in comparison to families with a similar level of financial income but in which one of the parents adds to the family's living standard by taking care of the children.

The MBM approach is similar to the NRC approach.[28] The difference between the two approaches is mainly that the expense on food in the MBM poverty line is set in a normative manner based on nutritional recommendations, while contemplating the family's composition by age and gender.[29] The normative nature of the MBM food section is an advantage over its relativity in the NRC approach, since the state of information today allows quite accurate and environmentally coordinated assessment of basic food expenses.

The FES approach, like the MBM approach, is also based on a basket of basic consumption expenditure that includes, among other things, the normative nutritional expense on food. The major difference between the FES approach and the NRC and

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showed such expenses to to fall into the range of 78 to 83 percent of the median. Calculations by Gottlieb and Manor (2005) for Israel in 1997 to 2002 yielded similar results.

[25] See Iceland (2005).

[26] Due to lack of detailed information regarding incomes in kind of public services, only private incomes in kind were included, mainly the non-cash income derived from accommodation in a privately owned apartment.

[27] Iceland (op.cit.), whose paper was published after GM suggested a similar calculation for the United States.

[28] The Canadian MBM uses percentiles 20 to 41 for non-food products. As far as income resources are concerned, the two approaches are alike.

[29] The Israeli food basket was calculated by the team of Nitsan-Kaluski at the Ministry of Health only for year 2002. GM calculated the recent years on the same basis while accounting for price inflation.

MBM approaches lies in the method of determining the basic expense of "non-food" in the poverty line: while in the aforesaid approaches the determination of basic products and their quantification requires an administrative and quite arbitrary process, in the FES method the extent of expense on non-food is determined according to the preferences of families positioned at the juncture between poverty and non-poverty in the distribution of private consumption expenditure. According to micro-economic theory, the relevant families' consumption equilibrium implies equality of relative marginal utilities between food and non-food to the inverse of their price ratio. One may therefore conclude that if a family consumes a sufficient food basket, there is ground to believe that at such a microeconomic equilibrium the families also reach a similar level of efficiency in the consumption of non-food products. This method's advantage is the lack of the need to itemize the composition of the basic non-food basket. The adjustment of the value of the non-food basket over time is consistent with consumers' revealed preferences. In this sense, the approach is less patronizing.[30] An additional important difference of the FES approach compared to the other approaches is its sole focus on consumption expenditure without any reference to incomes. In other words, a household is considered poor if its consumption falls below the consumption-poverty line. This may be interpreted as an expression of persistent poverty.[31] Like the half- median approach, the FES is also simple to calculate. Despite it being a basic-needs approach it may be considered as a relative poverty measure, since it is based on current expenditure surveys.

[30] We calculated the FES following the methodology described in appendix 1 of Ravallion (1994) and in Ravallion (1998, pp.17-18): The non-food part of the basic basket is calculated as an average of the "minimal" basket and the "maximum" basket: the minimum is approximated by the income or expense equal to the cost of the normative food basket and the maximum equals the expense on the family's non-food consumption at which the family's actual food expenditure equals the normative food expenditure.

[31] According to Milton Friedman's permanent income hypothesis, a household seeks to smooth consumption in accordance with permanent income through saving and dis-saving. Permanently poor families typically have less access to the capital market and thus to saving and dissaving. Their consumption will thus be more correlated with actual income, and therefore more prone to income variation. In contrast, the temporarily poor can continue with their routine consumption even when incomes drop unexpectedly. The FES might thus ignore the transient poor since their consumption is transitorily higher than their income which is below the poverty line. See also chapter 8 in the Bank of Israel Report, 2006.

c.1.c Problems of measuring poverty among the Bedouin

c.1.c.1 Lacking Representation of the Bedouin Population in CBS Data

The CBS survey's samples do not represent the entire Arab population in Israel, since the Bedouin of the non-recognized villages do not appear in the CBS sampling procedure. This missing population in the CBS-sample accounts for some 40% of the Bedouin population in the South.[32] This is one of the advantages of the Galilee Society's particular focus (over-sampling) on the socio-economic situation of residents in non-recognized villages.[33] An important conclusion toward improving the infrastructure of information pertaining to the social situation in Israel is to demand the inclusion of non-recognized Bedouin villages in the surveys of the CBS. This is particularly important considering the size and extent of poverty of this ignored population group. At present 40% the Bedouin population, many of whom are among the poorest of the poor in Israel, are not represented in official CBS social statistics. This ignorance made it easy for the consecutive governments in Israel to ignore the needs of this population.

c.1.c.2 A comparison between samples of the CBS and the Galilee Society[34]

Following the statistical effort made by the GS there are currently two different databases concerning the socio-economic situation of Arabs in Israel – data of the CBS and data of the GS. When we exclude the observations regarding the Bedouin of non-recognized villages from the GS samples, then the two databases should be comparable[35]. We therefore compared the averages of several variables in the data, based on the samples after making them compatible.

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[32] A few of those living adjacently to recognized communities might be included in the sample.

[33] While the number of Arab households in the income and expenditure surveys of the CBS in 2004 was 1,858 and 646, respectively, the corresponding number in the Galilee Society's survey was 2,680 (exclusive of Bedouin in non-recognized villages). The number of households of non-recognized villages in their sample was 570, reflecting over-sampling.

[34] While working on the Galilee Society database (2004) Gottlieb and Kachanovsky, 2007 compared the data, to the CBS expenditure survey for 2004. In addition, attention must be directed to the fact that in the Galilee Society database many observations are missing. We did not deviate from the common practice of setting them at zero, though it might create an upward bias on poverty. At this stage we found this assumption to bias poverty upwards by approximately 0-3 percent points.

[35] The Galilee Society sample excludes the Arabs of Jerusalem. We thus excluded them from the CBS data as well.

We examined the consistency of the two databases with the purpose of expanding the calculations of poverty in the GS database to other approaches beyond the accepted relative approach.

Gottlieb and Kachanovsky found monetary income and food expenditure to be of high resemblance in the two data sources. Regarding the remaining non-food expenses the same will only apply if their accumulated amount derived from the GS database is similar to that in the CBS data. The comparison includes a t-test for the equality of means and a Levene (1960) test of equality of variances.[36]

c.2 The poverty situation among Arabs and its development in recent years

Prior to engaging in measuring poverty on the basis of GS data, it is important to clarify a methodological problem concerning the calculation of the poverty estimate in this survey according to the NII poverty line: Given the NII's reliance on CBS data only, its poverty line is calculated without reference to the Bedouin of non-recognized villages. Hence, the official poverty line has a certain upward bias, since the addition of families, mainly in the bottom sphere of the distribution of incomes, raises the position of the previous median family as compared to the "new" median family after including the non-recognized Bedouin. The poverty line will thus be lower than the official line. Poverty incidence is affected by two opposing effects: (1) some of the newly-added families who entered the bottom sphere of the incomes distribution will raise the headcount, and (2) the reduction of the poverty line will exclude some families that were previously considered poor. It seems that the net influence in the half-median approach is very small. In the FES approach, poverty increases at a rate of one percent point. Chart 1 below does not account for this effect.

Poverty among the Arab population is very high, especially in non-recognized villages: In 2004 the incidence of poverty in the non-recognized villages was 79.2% (individuals) and the Sen Index for the poverty severity was 70% higher than that of the general Arab population, and 6.7 times higher than that of the "mainstream" Jewish non-orthodox population.

[36] Non-parametric tests were also examined. They did not alter the conclusions.

c.2.a The poverty situation in 2004 (including non-recognized villages)

Poverty in the Arab society is severe, and according to the relative approach in 2004 more than half the Arab population lived in poverty. Chart 1 illustrates poverty calculations for the Arab population according to the half-median definition and the FES approach.[37] The Sen Index[38], which illustrates the severity of poverty, was 4.4 times that of non-orthodox Jews.

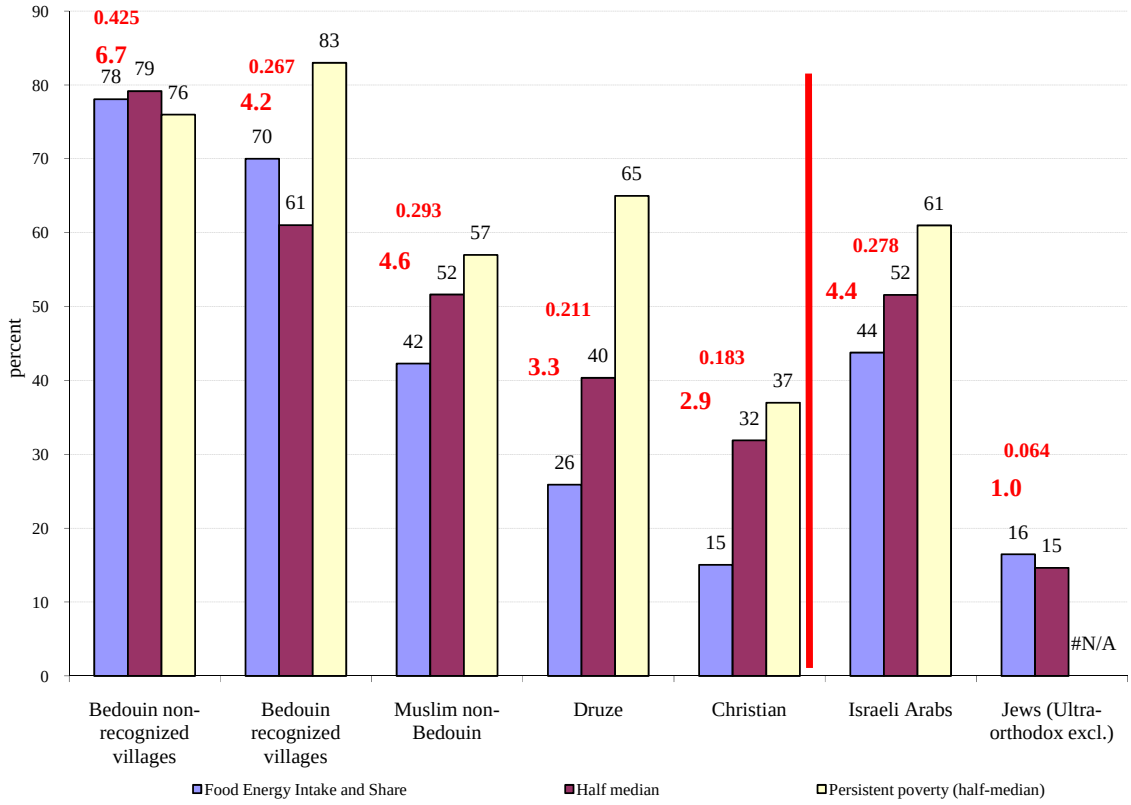
The poorest group according to the poverty incidence is that of the Bedouin in non-recognized villages. The incidence of poverty in recognized villages is the second largest, even though the severity of poverty is lower than that of the remaining Muslim population. The lowest incidence of poverty among Arabs is that of Christians. Notwithstanding, its level is still more than double that of the non-orthodox Jewish reference group. The severity of poverty among the Druze and Christians is more moderate than that of the Muslim population, and it is about 3 times higher than that of the Jewish reference group.

[37] As mentioned above, the FES approach can be interpreted as reflecting persistent poverty, which by definition will typically be lower than total poverty, since part of the poor may be in temporary poverty. Calculations of true persistent poverty require panel data on incomes and expenditures over time. Such data is not available in Israel. Here half-median persistent poverty is approximated by the headcount of individuals, for whom both income and consumption are below the official poverty line (see also the Bank of Israel's Annual Report, 2006, chapter 8 and the NII's poverty report for 2007).

[38] The Sen Index is defined as follows: $H[I+(1+I)*G_p]$ while H stands for the incidence of poverty, I stands for the gap of incomes from the poverty line, and G_p represents the Gini Index for inequality of incomes among the poor. Additional indices exist for the severity of poverty. An alternative index, well accepted in professional literature, is the FGT Index. This index expresses the weighted average of squared income gaps from the poverty line. There are other indices, such as the H.W. Watts Index of 1968. A version for measuring the FGT for the definitions of multi-dimensional poverty was developed by Chakravarty (1983).

Chart 1: The dimensions of poverty in the Arab society in Israel

(The Half Median and Basic Consumption expenditure – FES - Approaches, Including Arabs in Non-Recognized Villages)*



* The top numbers (e.g. 0.425 for the non-recognized Bedouin) are values of the Sen-poverty index, the number just below (e.g. 6.7 for the non-recognized Bedouin) are the ratios of the Sen index relative to that of non-orthodox Jews. The numbers above the column (eg. 78) indicate the poverty incidence according to the specific poverty definition, except for the number above the column of "persistent poverty (half-median): that number represents the share among the poor of those, for whom not only income is below the poverty line, but also their consumption expenditure.

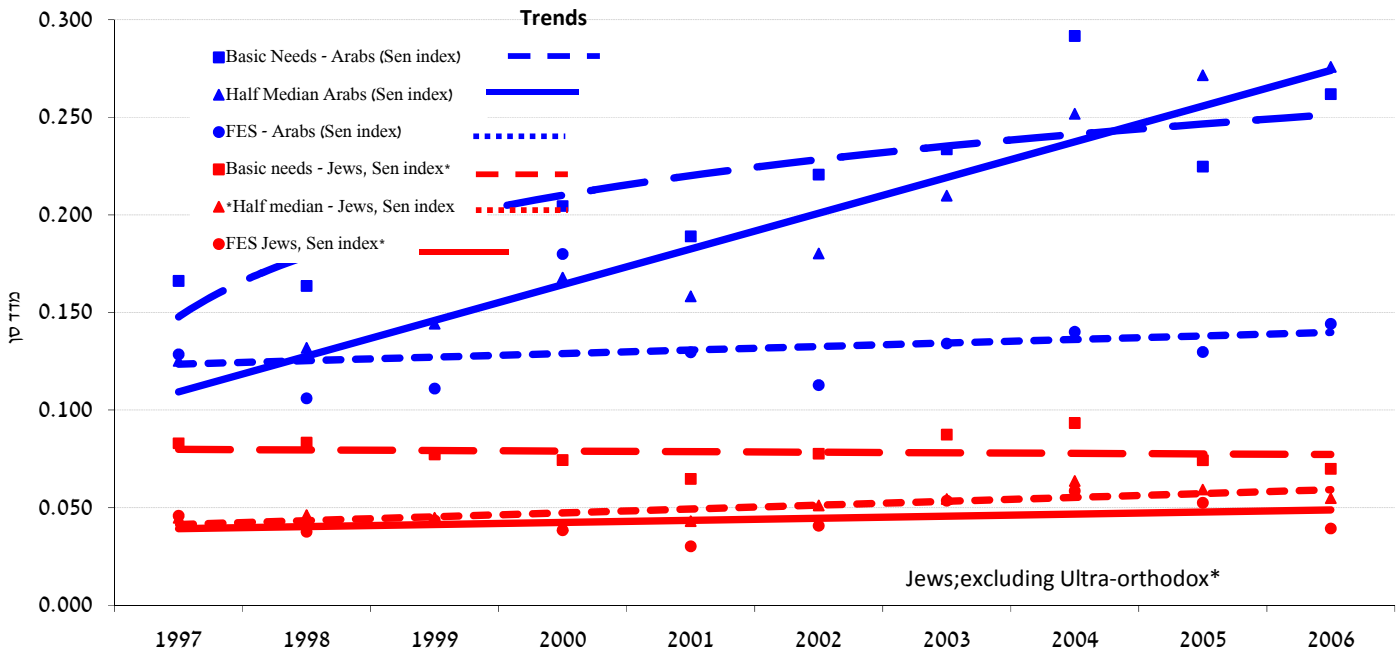
c.2.b Poverty over time (excluding non-recognized villages)

The severity of poverty in the Arab society is significantly higher (about 3 to 4 times) than that of the non-orthodox Jewish population. Over time there is an upward trend in the severity of poverty among Arabs. [39] This conclusion applies to both the half-median and the FES approaches. This result reflects a persistent process of a worsening of the standard of living during the observation period.

[39] Poverty data over time are based on CBS Data, thus excluding non-recognized villages

During the first years the severity of poverty fluctuated significantly according to the FES approach, stabilizing thereafter around the level of 0.13.

Chart 2: Poverty severity (Sen) among Arabs by various poverty measures
(compared to the Jewish mainstream society)



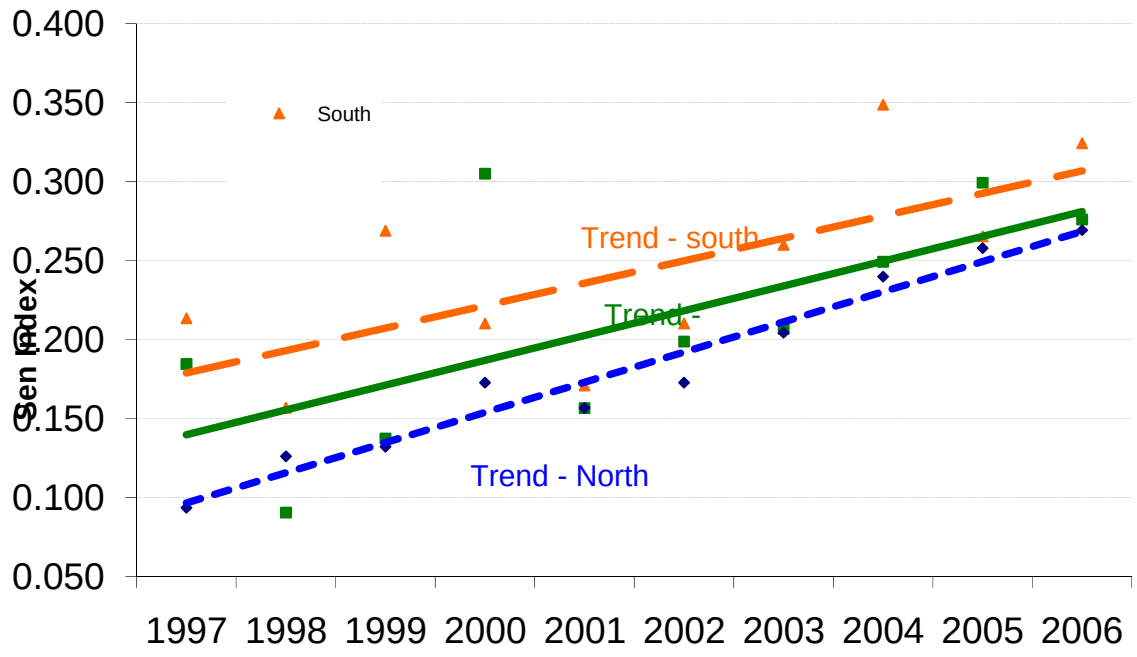
c.2.c Poverty over time - by regions (CBS Data)

Through the period 1997-2006 severity of poverty increased over time as measured by the half-median approach and the basic needs approach of the NRC/MBM, as illustrated in Charts 3 and 4, among the general Arab population in Israel. According to the FES approach there seems to be a downward trend of persistent poverty in the South, though since it is accompanied by sizable fluctuations this result seems to be unstable. The severity of poverty according to this approach slightly increased, as illustrated in Chart 5, in both the Center and the North. Persistent poverty might include also newly poor people.[40] An upward trend in the severity of poverty is evident in all regions according to the half-median definition (Chart 3), and according

[40] This is possible when the young generation of persistently poor families, who find it difficult to escape poverty, create new families. The likelihood of such a phenomenon probably increases inversely with low levels of education and high fertility rates.

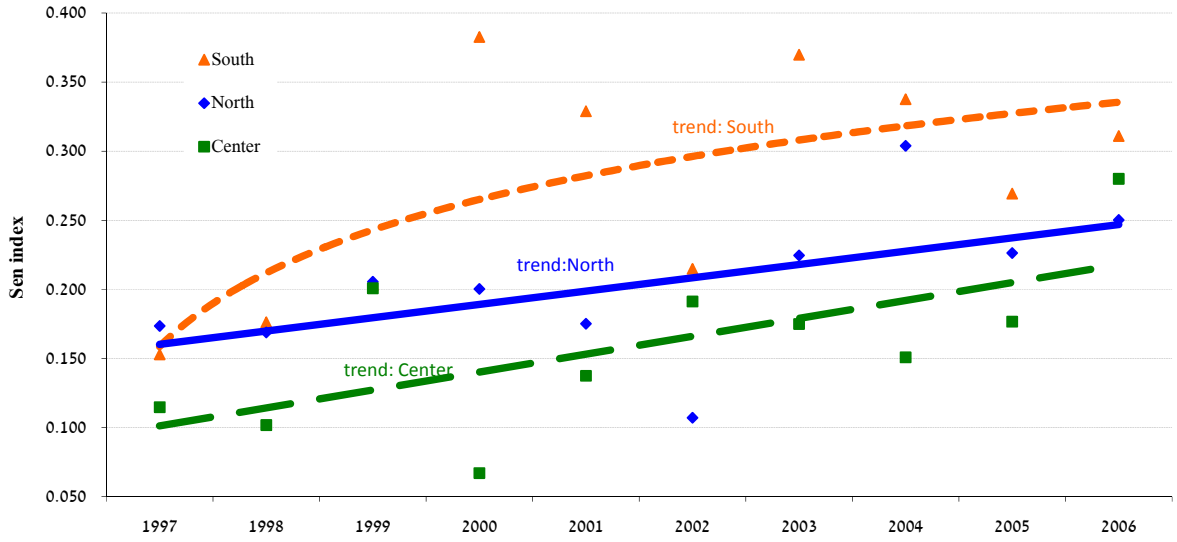
to the two other indices the severity of poverty fluctuates around a fixed average or shows a downward trend (Charts 4 and 5). The substantial impact that developments in the north (due to its relative size) have on the overall result, dictates the overall trend. We conclude that the gaps between the regions suggest a need for affirmative economic policy in the South.

Chart 3: Poverty severity (Sen) by regions; Half-median poverty measure



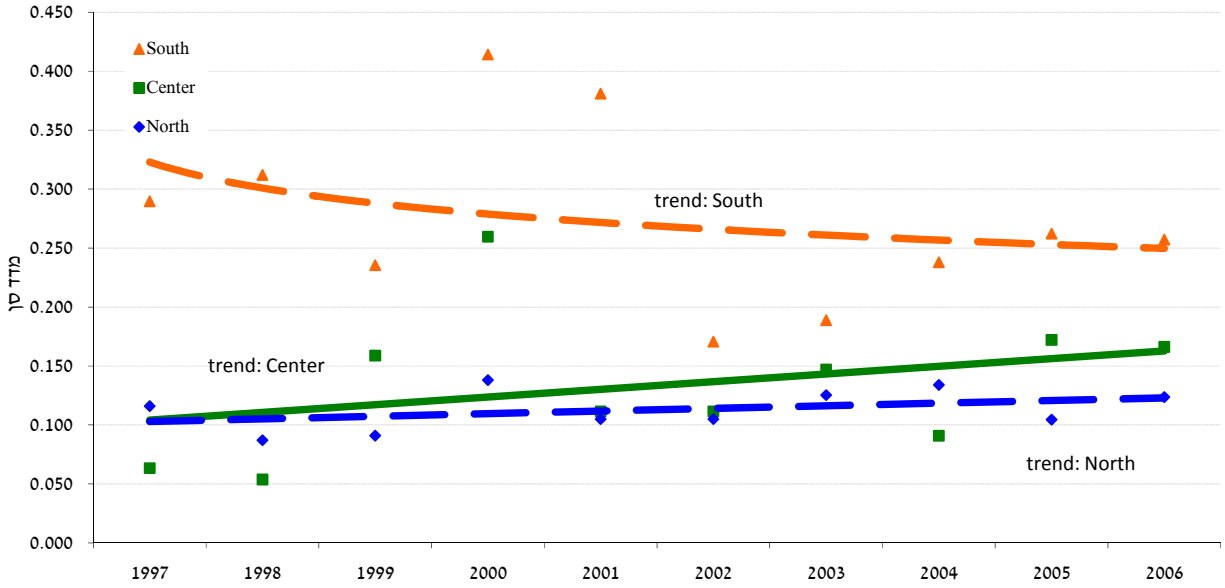
Source of data: CBS, Income Surveys

Chart 4: Poverty severity (Sen) by regions; NRC/MBM poverty measure



Source of data: CBS Income and consumption surveys for the years 1997 to 2006.

Chart 5: Poverty severity (Sen) by regions; FES poverty measure



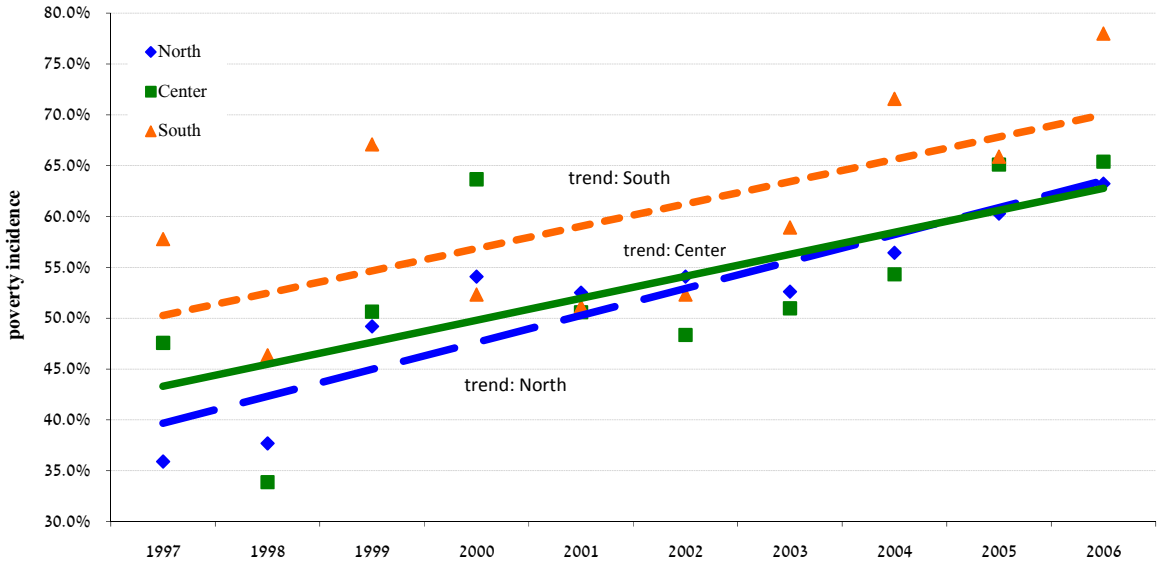
Source of data: CBS Income and consumption surveys for the years 1997 to 2006.

c.2.d Child poverty over time, by regions

The trends of child poverty are similar in both the half-median approach and the basic needs approach. Among Arab children of the north the deterioration was dramatic since 1997: the incidence of poverty among them went up from 36% to 60% (Chart 6). Among the children of the South, the deterioration occurred mainly in years 2002-2004, concomitant with the sharp cutbacks in child allowances and the recession during the first part of the same period. According to this approach, it appears that subsequent growth did not manage to remedy the adverse impact.[41] Among Arab families in the Center of Israel a particularly acute deterioration occurred in 2006. The state of poverty among Arab children towards the end of the observation period (2006) is particularly bad: two thirds live in poverty (according to the relative approach). The phenomenon of a converging incidence of poverty in the three regions is salient, and instead of convergence taking a course of improvement toward the relatively low levels of the late 1990's, the situation in the North and in the Center has been deteriorating towards that of the South, which most of the time has been the poorest region. The implication of such high poverty among children is severe for the long-term: It perpetuates persistent poverty in the generation of the children, since decent education is an important determinant for the young generation's capability to escape persistent poverty. The variety of alternative approaches to measuring poverty presented here emphasizes the interdependence between the choice of the poverty definition and the relationship between poverty and growth. It appears that growth had a moderating influence on poverty among children according to the definition of basic consumption expenditure of the NRC/MBM, and of the FES approach as well, while the relative approach, at most, indicates a moderation in the growth of the incidence of poverty.

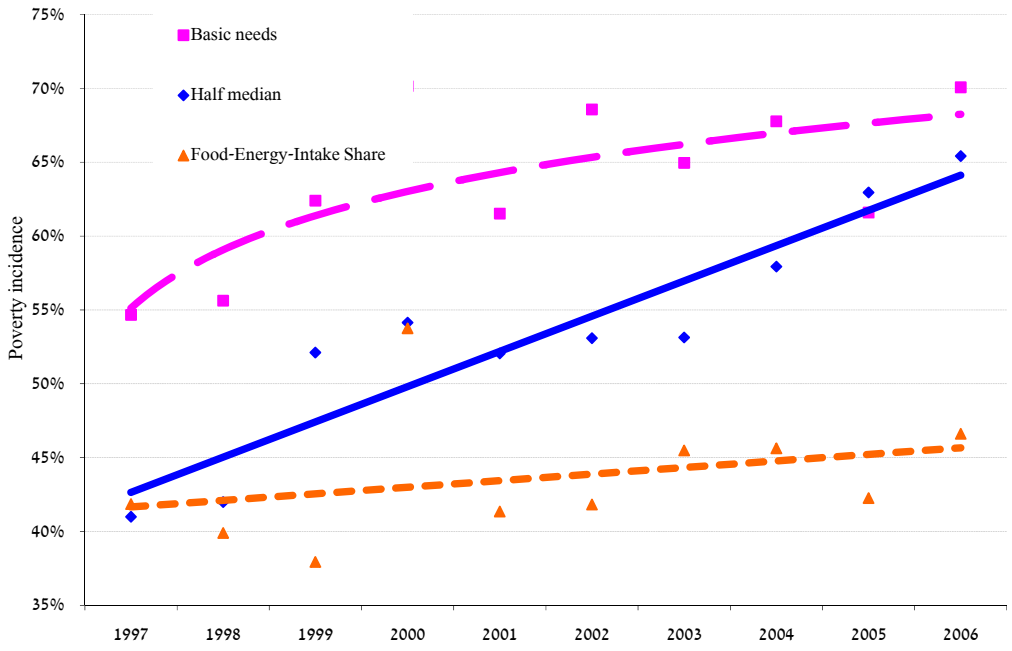
[41] One of the criticisms made against the relative approach pertains to its diminished sensitivity to growth, since the poverty line adapts itself each year to developments in the median income.

Chart 6: Poverty incidence among Arab children by region – half median
(Individuals)



The source for the calculations: income surveys, the CBS; the data (concerning the South) do not include Bedouin of non-recognized villages.

Chart 7: The incidence of poverty (individuals) among Arab children by alternative approaches



D Major determinants of poverty

This section elaborates on the micro-economic factors affecting poverty, thus relating poverty to individual and family-decisions on the one hand, and to government policy in the sphere of public investment in infrastructure on the other.

The size of the household is a standard determinant of the probability of living in poverty. This micro-economic effect is closely related to the effect of population on poverty at the macro level of the economy.[42] And still, it is common practice in standard poverty equations to include the size of the family (or alternatively the dependency ratio) as a central factor to explain the phenomenon of poverty.[43]

The purpose of this section is to analyze the relationship between education and behavior in the labor market as they are reflected in the data of the GS. As mentioned earlier the influence of decisions in the realm of education affects the family's long run poverty prospects. Furthermore, the government's infrastructure policy in transportation, sanitation has a strong influence on the family's microeconomic decision and thus on its probability of living in poverty.[44]

d.1 The household perspective

The interest in the relationship between fertility and family size is well established (see Becker, 1965), in which such decisions are analyzed in a dynamic model. Dasgupta (1993) relates the decision concerning childbirth and family size with an additional important dimension not mentioned in the neoclassical model - namely the cultural consideration latent in fertility patterns practiced in traditional societies. In recent years the demand for education by women has been recognized to play an

[42] See Ravallion (2005) for the effect of population growth – birth and mortality – on poverty. He distinguishes between direct and indirect influences and warns against a hasty conclusion regarding the treatment of fertility as part of government policy, while it does influence poverty. He stresses the simultaneity between poverty and fertility. Economic growth, for instance, may simultaneously influence the family's living standard and the decision pertaining to childbirth. In that sense at the micro-economic level the relationship between fertility and the probability of being poor may in part reflect a spurious correlation affected by an outside factor - growth.

[43] In the current empiric research (see below) this is not a problem since the database is cross section.

[44] See Dasgupta, 1995, and Ravallion, 2005 on the simultaneity between population growth and poverty.

important role in the fertility decision in traditional societies which are in a process of gradual change toward the woman's enhanced independence.[45]

d.1.a Fertility and family size

The age distribution among population groups of the Arab society in Israel reflects the differences in fertility between the various groups (Chart 8).

The share of families with more than 7 persons is significantly higher among the Bedouin of the South, as compared to the three other groups (Christians, Druze, and non-Bedouin Muslims). Thus for example, nearly all families with more than 9 persons are Bedouin. The smallest families are in the Christian society and the distribution of family size among the Druze and the non-Bedouin Muslims is quite similar. These differences are manifest in the age distribution in chart 9: thus for example, the share of children under the age of 5 among the Bedouin in the south is about 1.8 times that of the remainder of the non-Bedouin Arab society. Given the gaps in education, the differences in the rate of population growth emphasize persistent poverty. One way to counter this influence is by affirmative action in favor of the Arab-Bedouin population.

[45] See Basu (2002) for example.

Chart 8: Distribution of families by size – different population groups

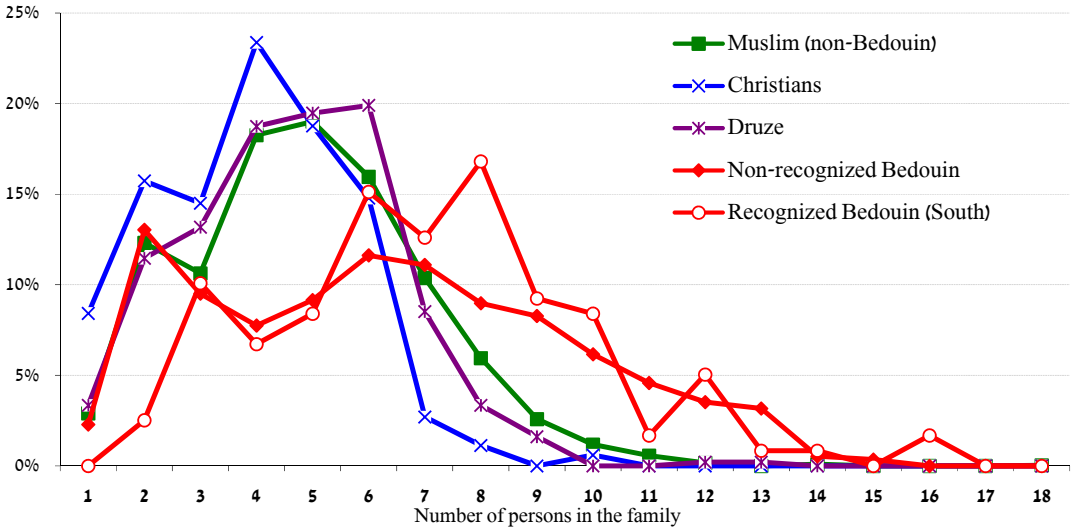
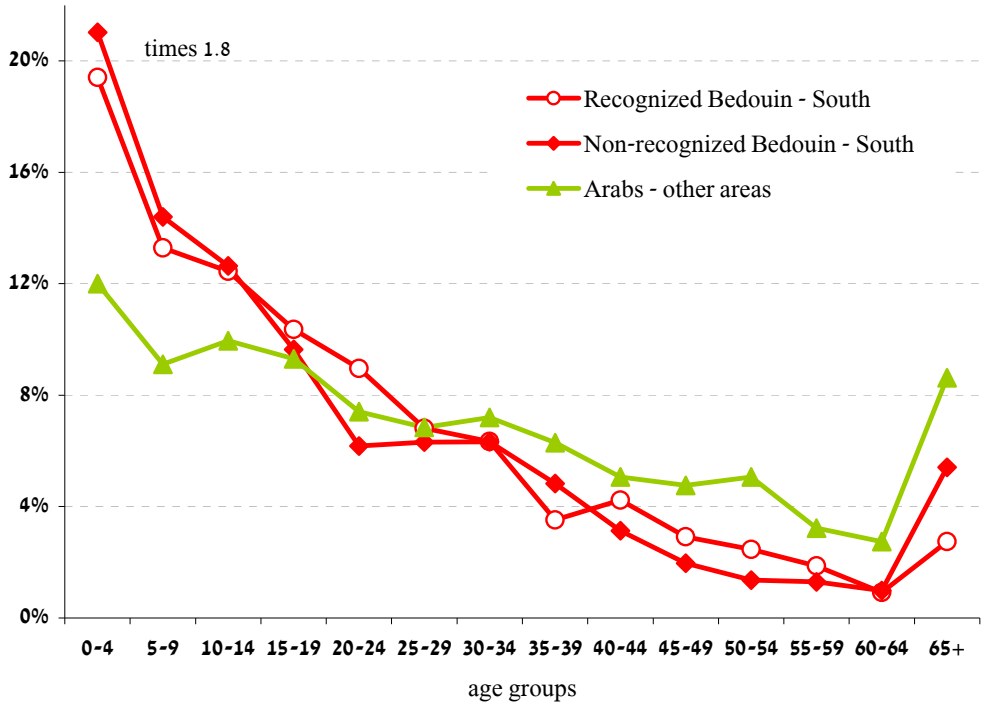


Chart 9: The distribution of Arab population by age and groups



d.1.b Education

Primary and junior high school education among the Arab population witnessed substantial changes in recent decades. Literacy, which was the privilege of few three

decades ago, quickly became available to almost all. The greatest leap in this respect is among the Bedouin. Its main achievement was the increase in the rate of school attendance in elementary school and junior high school, whereas at higher levels rates of school attendance are still lower, especially among the Bedouin of non-recognized villages (see Table 2 below).

d.1.b.1 The school-dropout problem

One of the salient problems in the area of education is the share of dropouts (a mirror image of the school-enrollment rate) from the education system at various education levels. Among young Christians up to the age of 20, the dropout rate from 12 school years is 11%. Among the Druze the dropout problem is almost as that among Christians and among the Muslims the dropout rates are significantly higher – 20% among non-Bedouin Muslims, and about 32% among the Bedouin (Table 2). The problem is severe among Bedouin of the non-recognized villages (over 50% dropout among 20 year olds and younger). The comparison between dropout rates of people aged 44 and older and the dropout rates of 20 year olds and younger indicates a substantial improvement over the years. The biggest improvement (94 percentage points) was achieved in the reduction of dropout rates at the level of elementary school among Bedouin women of the non-recognized villages. This success is primarily due to the establishment of elementary schools in a number of these villages. On the other hand, the least progress was achieved with respect to dropout ratios of Bedouin women for up to 12 years of schooling – only 36%; this is not surprising in light of the inadequate number of high schools in these communities.

The long distance between non-recognized villages and the nearest high school and the poor condition of the road-infrastructure certainly make students' access to schools more difficult. Contrarily to that tendency, in recognized Bedouin communities there has been a significant improvement with respect to up to 8, 10, and 12 years of schooling, for women and men alike. Similar conclusions may be found in Abu-Saad et al (2007), although their data and indicators are different from ours.[46]

[46] The source for calculations made by Abu Saad et al is the Ministry of Education, and it reflects a coherency of age through time, while our data is based on answers supplied by the sample.

Table 2: School enrollment rates– by population groups, gender, and age groups

Men and Women – All Ages						
Years of schooling	Non-recognized communities	Recognized communities South	Bedouin	Muslims (non-Bedouin)	Druze	Christians
Up to 6	75.4	84.6	83.1	91.8	92.7	93.7
Up to 8	64.8	75.6	74.8	84.6	85.8	87.7
Up to 10	44.9	59.6	57.1	66.5	69.6	74.1
Up to 12	32.2	44.9	42.9	55.5	58.8	63.9
Men and Women – 20 Years Old and Younger						
Up to 6	96.9	98.5	98.3	99.4	98.4	99.0
Up to 8	91.0	94.7	94.6	98.3	97.9	98.2
Up to 10	72.3	89.9	86.2	93.1	95.8	95.6
Up to 12	47.5	69.6	67.8	80.8	89.4	89.1
Men and Women – 44 Years Old and Older						
Up to 6	11.5	30.4	28.6	69.3	74.4	82.4
Up to 8	8.3	14.5	19.3	54.7	62.2	69.6
Up to 10	4.2	8.3	9.2	28.8	31.9	45.3
Up to 12	3.5	7.0	6.6	23.0	22.8	34.2
Men – 20 Years Old and Younger						
Up to 6	97.5	100.0	98.9	99.3	98.5	100.0
Up to 8	94.8	96.9	96.2	97.9	97.9	99.1
Up to 10	80.6	95.4	89.5	90.3	97.1	94.8
Up to 12	54.1	69.1	68.6	71.7	93.3	88.9
Men – 44 Years Old and Older						
Up to 6	23.8	46.9	45.0	82.2	89.6	89.1
Up to 8	17.4	24.1	30.7	65.8	81.9	74.8
Up to 10	9.7	16.1	15.9	36.2	51.0	47.7
Up to 12	8.1	13.4	12.7	29.7	38.6	38.0
Women – 20 Years Old and Younger						
Up to 6	96.0	97.1	97.6	99.5	98.2	98.0
Up to 8	85.8	93.1	92.8	98.7	97.8	97.4
Up to 10	60.9	85.5	82.7	95.9	94.4	96.4
Up to 12	38.7	69.9	66.9	90.3	85.9	89.4
Women – 44 Years Old and Older						
Up to 6	2.0	12.5	13.9	55.6	59.2	76.8
Up to 8	1.4	4.2	9.0	43.0	42.4	65.2
Up to 10	0.0	0.0	3.2	21.0	12.6	43.4
Up to 12	0.0	0.0	1.1	15.8	7.0	31.1

Source of data for calculations: the GS, 2004. The rates are defined as the ratio of school-enrollment of persons who successfully completed studying the indicated number of years relative to the potential rate for the relevant age group. The potential group for ages 20 and younger in the category of up to 12 years of study is limited from below by the age of 17.

Table 3: The change in school enrollment-rates between generations by gender

Pop. group / Schooling years	Non-recognized communities	Recognized communities South	Bedouin	Muslims (non-Bedouin)	Druze	Christians
among men (increase (+) in percentage-points), age 20 – compared to age 44+						
Up to 6	73.7	53.1	53.9	17.1	8.9	10.9
Up to 8	**77.4**	72.7	65.5	32.1	16.1	24.3
Up to 10	71.0	**79.3**	**73.7**	**54.1**	46.1	47.1
Up to 12	46.0	55.7	55.9	42.0	**54.7**	**50.9**
among women (increase (+) in percentage-points), age 20 – compared to 44+						
Up to 6	**94.1**	84.6	83.7	43.9	39.0	21.2
Up to 8	**84.5**	**88.9**	**83.9**	55.8	55.4	32.2
Up to 10	60.9	85.5	79.5	**74.9**	81.8	52.9
Up to 12	38.7	69.9	65.8	74.5	78.9	**58.3**
Gap in study-rates between men and women – between generations (percentage-points)						
The 20 year old and younger age group						
Up to 6	1.5	2.9	1.3	-0.3	0.3	2.0
Up to 8	8.9	3.8	3.4	-0.8	0.2	1.7
Up to 10	**19.8**	9.9	6.9	-5.6	2.7	-1.6
Up to 12	15.5	-0.7	1.6	-18.5	7.5	-0.6
The 44 year old and older age group						
Up to 6	**21.8**	34.4	31.1	26.5	30.4	12.3
Up to 8	16.0	19.9	21.7	22.8	39.5	9.6
Up to 10	9.7	16.1	12.7	15.2	38.3	4.2
Up to 12	8.1	13.4	11.5	13.9	31.6	6.9

A major success in recognized villages is the sharp increase in school enrollment rates of up to 10 study years' education. The increase in school enrollment rates of up to 12 study years' education is also impressive among women – 85.5% and 69.9% respectively (Table 3). This advantage in favor of the recognized communities could be a meaningful incentive to relocate from a non-recognized to a recognized community, particularly so, if, as reported in Abu Saad 1998 and Abu Saad et al., 2007, Bedouin mothers tend to attach a high value to their children's education.

The data suggest that the reduction in dropout rates in non-recognized villages may be attributed to the government's investment in elementary and junior high schools in non-recognized villages. Were the government to take similar action with respect to high schools, we might eventually witness an improvement at that level too.

d.1.b.2 Causes of school-dropout

Adequate infrastructure is crucial to the development of the economy and of the population's living standard. Infrastructure should thus be expected to affect a wide

variety of variables, including poverty. The influence on poverty reflects an overall effect, with a complex transmission mechanism, given the numerous individual decisions that are affected, from education, to health and employment. Such direct and indirect components cannot easily be distinguished in an empirical analysis given the interactive nature of their effect on poverty and vice versa.

A high dropout rate is observed in the 8th grade, mostly in the South (Table 4). In this section we wish to inquire about the relationship between the dropout-rate and the household's access to public infrastructure. We should keep in mind that the analysis of the effect of infrastructure on dropout rates in our data set suffers from a timing problem, since access to infrastructure relates to the year of the survey, while the dropout rate reflects an extended and variable number of years for each individual.

Table 4: Characteristics of school-dropouts and others (percent)[47]

		Dropouts	Non-dropouts	Dropouts	Non-dropouts
The entire Arab population		22.8	77.2		
Area	North	16.2	83.8		
	Center	37.4	62.6		
	South	47.1	52.9		
		All Arabs		South	
Study-years (average), parents		7.6	9.7	7.2	9.1
Study-years (average), children		7.8	12.0	7.8	12.0
Households with electricity net access ,%		86.6	97.4	50.1	71.2
Households living at least 1 km from the nearest bus-stop, %		34.0	32.7	61.6	48.5
Households living at least 1 km from the nearest public clinic, %		48.9	38.6	95.4	76.8

Source of data for calculations: the Galilee society survey, 2004.

Table 5 features three regressions which examine the factors determining dropout rates in the Arab population, and especially in non-recognized villages. The relevant factors are demographic and also relate to the household's access to public infrastructure. In order to minimize the mentioned timing problem, we refer only to dropout observations that occurred in the last three years. Furthermore, in order to assure that we are dealing with dropouts only and not with youngsters who are still in the process of accumulating human capital, we include only data on individuals aged 17 or more. The first regression refers to the entire Arab population in Israel. The main determinants in this regression are the parents' average study rate, gender, and

[47] The dropout rate is defined as the gap between the potential study rate, in which the entire relevant age population studies, and the actual rate. The calculation here is made on the basis of 12 study years.

the age of the person who dropped out, as well as a dummy variable for the household living in a non-recognized village. In the second regression we added the variable of access to public infrastructure. This caused the dummy variable of belonging to a non-recognized village to be irrelevant.[48] We interpret this result as an indication that the inadequacy of infrastructure is more important than some kind of a "cultural" argument in explaining the dropout ratio.

Table 5: Determinants of dropping out of school up to high-school level

Regression	(1)		(2)		(3)	
Method	LOGIT		LOGIT		LOGIT	
Dependent var / Explanatory v.	Dropout dummy[1]		Dropout dummy[1]		Dropout dummy[2]	
Constant	15.77872	***	17.01181	***	25.06756	***
The parents' average study rate	-4.477208	***	-4.179457	***	-2.523018	*
Non-recognized Bedouin	0.619915	**	-0.215318		-	-
Recognized Bedouin, south	0.675368		0.706913		-	-
Male	0.867336	***	0.869283	***	-	-
Age	-0.909316	***	-0.910699	***	-1.329547	***
Center	1.097895	***	1.220385	***	-	-
Infrastructure index (ten types)	-	-	-0.015607	**	-0.028656	**
McFadden R-squared	0.225124		0.230886		0.196379	
Explained variable - mean	0.192254		0.192788		0.451327	
Number of observations	723		721		113	

[1] Regression on the age range of 17-19.
[2] Regression on the age range of 17-19, non-recognized Bedouin.
*, **, *** symbol significance at levels of 10%, 5%, 1%, respectively.

d.1.c Fertility and education

Fertility constitutes an important factor in establishing the probability to live in poverty. The bigger the family size the less are the resources available to each family member. The relation between poverty and fertility is complicated and reciprocal (see Dasgupta, 1993 and Ravallion, 2005). The relation between poverty and fertility is influenced, among other things, by the education the mother accumulated prior to her (first) marriage. The regression in table 6 attempts to explain the number of a woman's childbirths. Education at the time of marriage appears in the regression with

[48] The extent of access to the various types of infrastructure was set according to the Principal Components method in reference to the ten basic types of infrastructure. These include public transportation services, connection to the systems of electricity, water, sewage, telephone line, garbage disposal, distance from sick funds and from a clinic, the distance from school and access to a playground or public garden.

high statistical significance. Moreover, standard demographic factors were found to affect fertility as expected.[49] We have also found the factor of preference for boys (a positive sign for the rate of girls out of all children).

Table 6: Determinants of fertility

Dependent variable: The number of live childbirths per woman (estimated by OLS method)	
Variable	**Coefficient**
Constant	-5.77***
Muslim-Bedouin	1.08***
Muslim-Bedouin, non-recognized village	0.83**
Christian	-1.02***
Druze	-0.41***
Age	0.62***
Age squared	-0.01***
School enrollment-rate prior to 1st marriage	-2.07***
Age at first marriage	-0.15***
School enrollment-rate, change since 1st marriage	-2.04
Divorced before the age of 40 (yes=1, no=0)	-1.06***
Widowed before the age of 40 (yes=1, no=0)	-1.38***
Share of girls out of total number of children	0.35***
$R^2 = 0.5415$, adjusted $R^2 = 0.5392$, n = 2187	
§ The school-enrollment rate is calculated as the ratio of the years of study completed relative to the potential years of study in the relevant age group.	
*, **, *** Symbol for significance at levels of 10%, 5%, and 1%, respectively.	

d.2 The public perspective

One of the main functions the State is expected to provide is adequate infrastructure for its citizens – basic infrastructure such as water, electricity, sewage system, garbage disposal, public transportation, as well as a higher level of infrastructure in a civilized society, related to health, education, and culture. The importance of public investment in infrastructure to the household can be ranked by the household's ability to substitute for its inadequacy. The degree of substitutability may be reflected by the ability and the cost incurred by the household when accessing a given service independently, when the public infrastructure is lacking. For example, while there is a very high cost involved in the private substitution of an inexistent road, since building the road is complicated and expensive, requiring also official permits etc.. Hence, the private and social loss involved in the lack or inadequacy of a road is particularly

[49] The age of divorce and the age of becoming widowed were restricted in order to insure that the influence of these two variables will be related to the age of fertility.

high. On the other hand the lack of a public transport system is smaller for families with higher income, since they can substitute more easily for public transportation. For the poor or the disabled its lack will be much more costly, for example lowering their chances of finding employment. Investment in basic infrastructure for the Arab sector has been neglected for many years. The reasons for this are partly rooted in discrimination practiced by the State and public institutions in areas such as water, electricity, and transportation, against the Arab population, and in particular, against the Bedouin population in non-recognized villages. The problem is further complicated by conflict and mismanagement within the local authorities. Furthermore the lack and inadequacy of basic infrastructure also reduces private incentives for building infrastructure.

d.2.a Household access to public infrastructure

Difficulties of accessing basic infrastructure typically characterize very poor countries, or remote regions in very big countries. One might thus expect that such problems should not occur in a small and advanced country such as Israel. The existence of such problems in Bedouin communities thus indicates that discrimination might be part of the explanation.[50] Government statistics concerning the distribution of investment in infrastructure by regions and communities are not available. We thus had to resort to indirect indicators. The present information of the GS is indirect since it was gathered by a household questionnaire regarding their access to infrastructure. Part of the infrastructure, such as roads and schools are usually provided directly by the government, while services of education, welfare, and health, as well as religious services are provided by the local authority and the health insurance companies respectively, with the financial participation of government. With regard to year 2004, government financing should have been more generous for the economically weak local authorities (the balance grants). Tal Shahor (2007) examined the collection of incomes derived from municipal taxes in Jewish, Arab, and Druze communities while accounting for the socio-economic situation of the authorities. He concluded that the

[50] Alesina and Glaeser, 2004, find heterogeneity in the population to be an important determinant of poverty. They argue that heterogeneity leads to discrimination that arises from the fact that minorities, little appreciated by the "mainstream" groups, who are typically better represented in government, will find it harder to acquire state budgets for their well being.

shortage in incomes derived from municipal taxes in Arab communities was to some extent due to the residents' unwillingness to pay taxes, and also because the government fulfilled its financing function insufficiently, refusing in part to support the economically weak Arab authorities. Convenient access to public transportation is crucial for the residents' successfully integration in employment, as well as for other economic and social activity. Transportation infrastructure has three aspects: (1) roads, railroads, streets, and inner pathways; (2) the existence of a system that connects the inner system to the system of interurban roads and railroads; (3) an infrastructure of a network of transportation stations within the community, and from the community to other communities, and economic and social centers. The GS survey does not afford an opportunity to study all three aspects since the questions presented in the survey only inquire about the household's access to transportation services. The possible answers in the survey are: a distance of up to one kilometer; a distance of between one kilometer and five kilometers; or a distance of more than 5 kilometers between a household and the nearest public transportation stop. The variable's definition is problematic, since in the recognized and non-recognized Bedouin settlements, as well as in many settlements of the North and Center there is no public transportation – neither within the settlement nor between settlements in the area, and still many of the people sampled noted that public transportation is available at a distance of less than one kilometer. In some of the settlements there is no access to a main road, or there is no system of roads inside the settlement.

In any case such information thus does not allow for an estimate of the extent of investment needed in communities suffering from inadequate infrastructure.

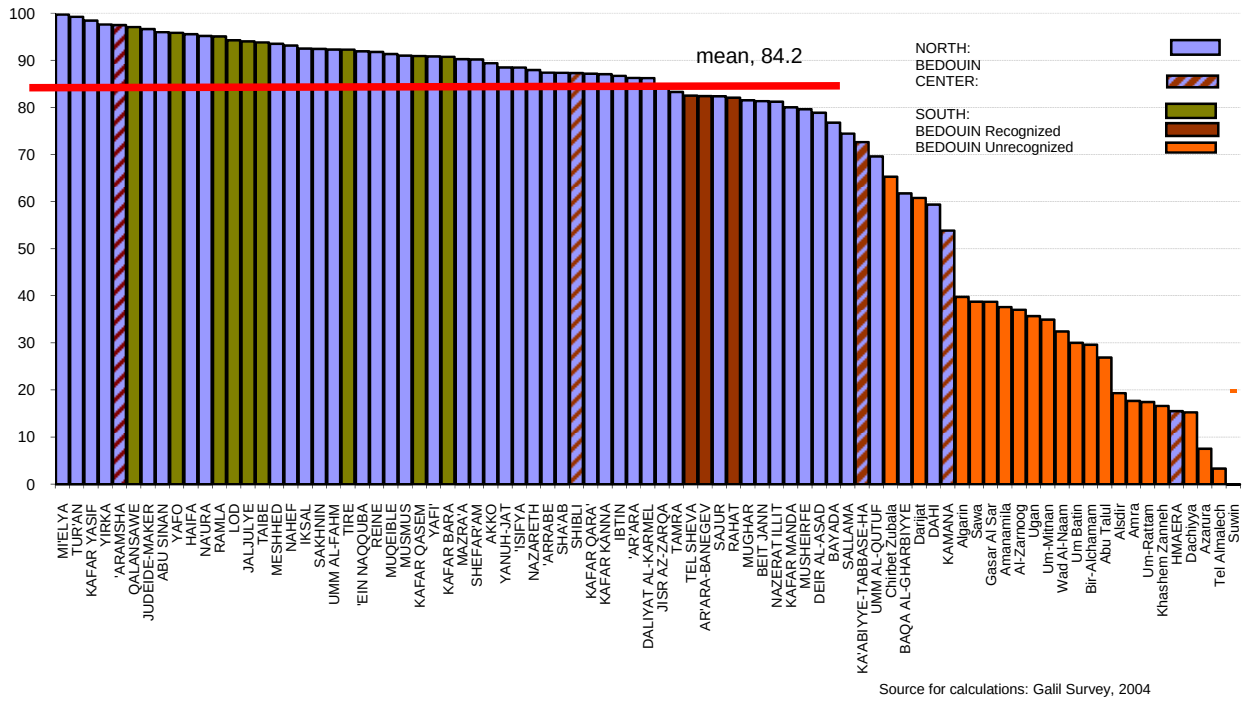
Chart 10 illustrates an index for infrastructure access in the various Arab communities. The index's values are based on answers provided by Arab households in the GS survey with regard to the population's access to the infrastructure. The access-indicator varies between zero (no access) and 100 (full access). For each community, the value of the infrastructure index reflects the average values of the index for households in the community, each weighted by household size.

The inadequacy in public transportation infrastructure affects households regressively: given its substitutability by car ownership, the adverse effect decreases with the family's standard of living, and therefore hurts poor families more strongly. Accordingly a reduction in the government's discrimination in public transportation

investment could constitute an effective anti-poverty policy. An important problem of such discriminatory attitude is that it provides a negative signal to domestic and foreign private and corporate investors, which is detrimental for these communities.

The lack of infrastructure is extremely severe in non-recognized villages in the South where the highest score reached by the index is 65 points and the lowest is virtually zero (chart 10). In three of the non-recognized villages in the sample the index reaches less than 10, and in 8 of them the value is below 20. In the recognized Bedouin communities, which are part of the sample, the situation is better – about 80. On the other hand, the situation of some of the Bedouin communities of the North is similar to that of non-recognized villages of the South. Chart 10 also clarifies that the situation cannot be blamed solely on the land-dispute between the Bedouin and the State, since the chart shows that inadequate access is a feature common to almost all of them, though by varying degree.

Chart 10: Ranking of the Arab communities by access to basic infrastructure
(100= full access, 0= no access)



Source for calculations: Galil Survey, 2004

Notwithstanding, discrimination is more severe in the South. Furthermore, one should keep in mind that the underinvestment in roads and junctions both in the non-

recognized villages and between them and main roads in their vicinity has not been included in the GS survey. The various governments over the last years have not only been neglecting infrastructure in Arab communities, but there is also a lack of transparency concerning statistics about infrastructure. An improved transparency in infrastructure statistics for the whole economy is a first and necessary step in order to ameliorate inequality in infrastructure and access to it. Furthermore, the government does not seem to have any strategy for closing the gap in the Arab sector.[51] The "Agenda" document of the Prime Minister's office can testify to that by its disregard of the issue of infrastructure.[52]

The dropout regression above (table 5) emphasizes the wide effect, exerted by inadequate infrastructure access, such as on school dropout behavior in non-recognized villages, thus adding to the persistence of poverty through the negative effect on future earning capacity. Table 7 indicates that the biggest problem is in the area of health: the distance to the nearest public clinic of about 44% of the Arab population is more than one kilometer away from home, and for more than 8% of them the nearest clinic is more than 5 kilometers away. With regard to about 30% of the population the distance to the nearest stop of public transport is more than 1 kilometer and for nearly 5% the distance is greater than 5 kilometers. This diminished access is even sharper when contemplating the low rate of private vehicle owners: The table in Annex 1 reveals that in recognized Bedouin communities, and among the other Muslims only 64% own a car. In the non-recognized villages only 45% own a private vehicle. Ownership of a commercial vehicle is at a rate lower than 11% through all observed population groups. 30% of individuals are more than 1 kilometer away from school and about 17% of the observed population is not connected to the sewage system. Nearly 20% of the Arab public has to dispose of garbage privately. About 32% of the population is not connected to a fixed (Bezeq) telephone line. Hence, the biggest problems of accessibility are in the areas of health, transportation, education, and communication. Among the basic infrastructure, the most difficult situation is in the area of sewage and electricity.

[51] See for example the "Agenda" document which ignores the problem of infrastructure in the Arab sector.

[52] It only mentions the "lack of convenient and regular transportation to work places". Moreover, the State has not bothered thus far to study the topic through an official survey of the CBS.

Table 7: Problems of Accessibility by the Type of Infrastructure

Type of infrastructure	The population with accessibility problems						
	Total Arab population						
	The rate out of the total relevant population (in percent)						The number of individuals
	South			Center	North	Total	
	Recognized	Non-recognized	Total				
The distance from the clinic closest to the place of residence is more than 5 kilometers	0.0	65.7	26.5	0.7	6.4	8.2	84,913
The distance of the public clinic closest to the place of residence is more than 1 kilometer	85.0	89.0	86.7	20.8	40.5	43.8	451,265
The distance of the school from the place of residence is more than 1 kilometer	28.7	76.9	48.0	11.3	30.4	30.1	310,070
The distance of the public transportation stop is more than 1 kilometer	47.5	77.6	59.3	28.4	33.1	35.9	369,825
The distance of the public transportation stop from the place of residence is more than 5 kilometers	1.9	51.8	22.7	0.0.	5.5	7.0	72,208
A source other than the Electric Corp. for the supply of electricity (generator)	0.0	90.6	36.5	0.0	0.9	5.4	55,191
Not connected to the sewage system (sewage cesspit)	1.5	99.5	41.0	1.9	15.7	17.1	176,328
An independent source of water supply (other than through Mekorot)	0.0	40.3	16.3	0.0	0.9	2.8	28,598
Garbage disposal other than by the Authority	9.6	89.3	41.6	1.2	19.5	19.9	204,903
No telephone line connection	78.2	99.3	86.8	22.3	23.4	31.4	324,151

E. Poverty and the labor market

Salient characteristics of behavior in the labor market exhibited by the Arab population in Israel are a low rate of women participation in the labor force and a high rate of unemployment among them. There is quite an extensive literature concerning the participation of Arab men and women in the labor force. A summary of major papers on the topic and reference thereto, as well as a discussion on employment and poverty can be found in Flug and (Kaliner) Kassir (2001). For more recent papers see Fichtelberg (2004), Saban (2006), and G'abarin (2007). These papers however do not touch on the infrastructure, which is dealt with in our analysis. The obvious candidates for explaining the phenomenon include the lack of employment opportunities, the large number of children, a low level of education,

lack of convenient public transportation infrastructure to enable access to employment opportunities in nearby Jewish areas, lack of day care centers for children, tradition, and so forth. The situation in the Bedouin communities, especially in non-recognized villages is worse than in the rest of the Arab society, most probably due to inadequate infrastructure services, which imply low expected rates of return on private investment.

These disadvantages are less felt in recognized Bedouin communities. However there remains a lack of work places. Particularly for women, employment opportunities are limited to the education system and social services. The main outlook for women with a high-school diploma, a non-academic post-high-school education or academic education is in teaching, typically at elementary school. For low-educated women work opportunities are hard to find. Some opportunities available to women in these communities are in social and health services, though they require academic education, which is in short supply. Indeed, the rates of participation and employment of women with academic or non-academic post high-school education are very high. Small businesses in the Bedouin communities are typically owned by the family and the job opportunities are occupied by the men in the family. Hence, also in these types women with high-school or lower education are at a disadvantage.

The highest rate of labor force participation among women is in the Center of Israel, with a participation rate of 27%. In the North it is somewhat lower (23.4%), while in the South the average participation rate is at a very low rate - 9%. These differences can be attributed to various factors such as education, demographic traits, the type of community and employment opportunities, physical condition, and children at home. Christian women have the highest participation rate, about 38%, followed by Muslim women (mainly in the Center), and Druze women with about 23% participation. The cultural-religious aspect certainly plays an important part, though one of the important insights to be gained from the logistic regression model (see below) is to elicit the impact of standard labor market variables, the influence of which is often blurred by the cultural-religious presentation, since some of the factors might be interrelated. A good example is the interdependence between the cultural-religious aspect, the heterogeneity argument mentioned above and discrimination in infrastructure access. Furthermore, the rate of labor force participation of Muslim women in the Center of Israel is nearly four times higher than that of Muslim women

in the South. Their education, which on average is higher than that of the Southern women, explains at least part of their relative success in employment.

Table 8: Indicators for the Arab Labor Market in Israel in 2004 (in percent)

	North				Center	South		
	Muslims	Christians	Druze	Total	Muslims	Recognized village	Non-recognized village	Total
Men and women								
Labor force participation[1]	43.9	49.7	40.5	44.2	47.1	31.4	33.4	32.2
Employment[1]	38.8	44.2	35.4	39.1	44.4	25.2	25.6	25.4
Unemployment[2]	11.6	11.0	12.6	11.6	5.9	19.6	23.4	21.1
Men								
Labor force participation[1]	64.5	62.5	57.3	63.4	66.9	54.5	56.5	55.5
Employment[1]	58.1	56.1	52.3	57.1	63.6	43.1	43.2	43.2
Unemployment[2]	10.0	10.3	8.7	9.9	4.9	20.9	23.6	22.0
Women								
Labor force participation[1]	22.4	38.2	23.1	24.6	25.9	10.0	6.8	8.8
Employment[1]	18.7	33.6	17.9	20.6	23.7	8.7	5.4	7.4
Unemployment[2]	16.4	11.9	22.5	16.2	8.5	13.1	21.2	15.4

[1]Employed + unemployed as a share of the working age population (people aged 15 and older).
[2]Non-working people who are actively looking for work, as a share of the labor force. Labor force = Unemployed+Employed
The source of data for calculations: GS, 2004.

The logistic probability model featured below examines the effect of the various factors and their interactions on the probability of women aged 19 years and older to participate in the labor force. The dependent variable is binary, with a value of 1 if the woman belongs to the labor force, and 0 if not. The variables that affect the woman's probability to participate include personal characteristics such as education, age, religion, personal status, and additional demographic variables such as the geographic region, an indicator of the physical condition of the household's head, who is typically the main provider. We add infrastructure access by use of the composite variable described above.

Age: The squared variable is added because a woman's desire to work may be non-linear with an interior maximum. It may reflect the incentive to find a job after the desired number of children has been achieved and their age distribution permits the mother's daily absence. At the same time there may be a marginal inclination of a decreasing desire to enter the labor market with age.

Education: The opportunity cost of leisure increases with the level of education. We assume that the relevant wage offers are not in the backward bending part of the labor supply function.

Community size: the size of the community reflects urbanization, i.e. we expect greater employment opportunities and a higher probability of participating in the labor force. In a city, the substitution for home production (e.g. caring for children, preparation of food, and cleaning the home) is easier.

Children at home: the number of children reflects the woman's level of commitment to the family. The mother's inclination to look for a job, mainly at early ages of the children, reduces the chances of her participation in the labor force.[53]

Personal status: The data include information on the personal status. A woman can be single (includes living with a partner but not married), married, divorced, widowed, or separated. The assumption is that a married woman is more committed to the home than other women, thus implying a higher probability of participation in the labor market of a divorced or widowed woman, possibly also due to the greater economic hardship of a single parent mother.

Infrastructure: It reflects the living standard and the number and variety of employment opportunities in the community. Moreover, the state of transportation infrastructure points to the degree of mobility between home and potential employers outside the community. In a community with poor infrastructure we expect low business activity and few caretaking facilities for the children.

Physical (personal) condition: Two variables are available – chronic disease and disability. The estimation results are featured in Table 9. The signs of the coefficients of the demographic variables (age, age squared, education, personal status, children at home, and the level of urbanization) are in the expected direction and statistically significant. The positive influence attributed to the state of public infrastructure is particularly interesting, from the point of view of government policy.

Model 1 shows that the participation rate of Bedouin women in the South is significantly lower than those of Arab women in other regions, with the remaining factors held constant. Model 2 expands model 1 by including the infrastructure variable. It is shown that this variable positively contributes to the rate of female participation in the labor force.

[53] In the Galilee Society survey there is difficulty to extract the number of children in each age sub-group of a woman, since it is possible that in one household lives an extended family that includes the families of the household's head sons and daughters, or additional wives and children of the household's head, a thing that makes it more difficult to identify the children's parents. In the regression displayed herein we use a dummy variable that receives the value 1 if the woman had a live childbirth in the last year, and 0 if not.

Table 9: The Probability of a 19+ Years Old Woman to Participate in the Labor Force

A LOGIT model (the dependent variable = 1 if the woman belongs to the labor market, =0 if not)		
The variable	**Model 1**	**Model 2**
Constant	-6.48***	-7.34***
Age	0.30***	0.30***
Age square	-0.00***	-0.00***
Education – none (base group: up to junior high-school education)	-1.50***	-1.41***
Education – secondary	0.62***	0.60***
Education – post high-school (non-academic)	1.55***	1.53***
Academic education	2.74***	2.66***
Center region (base group: North)	0.41***	0.34***
Community < 5000 persons (base group: 5-15 thousand inhabitants)	-0.17	-0.13
Post high-school non-academic edu.* recognized Bedouin village	2.60***	2.23***
Secondary non-academic edu.* non-recognized Bedouin village	1.73***	1.84***
Post high-school non-academic education * Center	-0.97***	-0.99***
Education: still in school (post-high-school)	-1.07***	-1.10***
Suffers from Illness	-0.67***	-0.66***
Disabled	-1.08***	-1.08***
Married	-1.59***	-1.59***
Married*secondary education	0.31	0.32
Married*post high-school non-academic education	1.99***	1.98***
Married* academic education	1.68***	1.73***
Married*secondary education * city > 15 thousand inhabitants	0.42*	0.42*
Children below age of one year (yes=1, no=0)	-0.84***	-0.82***
South (yes=1, no=0)	**-0.71****	-0.36
The level of the ten-infrastructure index in the community		0.01***
McFadden R-squared	0.35145	0.35384
A number of observation with a dependent variable=0	3465	3459
A number of observation with a dependent variable=1	822	821
A percent of accurate observations (dependent variable=0)	96.16	96.15
A percent of accurate observations (dependent variable=1)	50.61	50.55
A percent of accurate observations (total)	87.43	87.41
The source of data for calculations: the Galilee Society survey, 2004 *,**,*** symbols significance at levels of 10,5, and 1, respectively		

The introduction of infrastructure into the equation makes the regional variable for the South redundant. Therefore the low participation rate in Bedouin communities of the South and in the non-recognized villages may largely be explained by the difference in infrastructure, suggesting that the phenomenon can be explained by an economic policy variable, infrastructure. There is thus no need to refer to the fuzzy concept of "culture" or region. This result presents a challenge to the government's top priority goal of increasing employment: the government could achieve this goal simply by a drastic reduction of discrimination in the area of the most basic infrastructure. Our results suggest that the implications will be important, way beyond the initial impact on employment: such policy will raise the standard of living, thus reducing poverty,

including child poverty, improve the children's education, and thus may also reduce persistent poverty. Instead, the aggressive cuts in income support for people in working age in 2002 and 2003, rather than creating an incentive to work, have raised poverty. The regional variable for the center raises participation as expected, whereas community size does not add to the explanation.

In a non-linear model (such as the one before us) coefficients cannot be interpreted in a straight forward manner as the marginal contribution of a specific variable to the probability of participating in the labor force. In order to get a sense of the variable's influence on the probability of participating in the labor force, the probability of participating in the labor force is graphically represented against a single continuous variable, while the probability is calculated at the point of the averages of the other continuous variables in the regression, and at certain levels (0 or 1) of the dummy variables. This is done in charts 11 and 12 for the probability of a woman to participate in the labor force: it is described against the level of infrastructure in her community. The probabilities are calculated at the point of the average age of women in the sample (38 years old). Chart 11 illustrates the movement of probabilities across various levels of education.

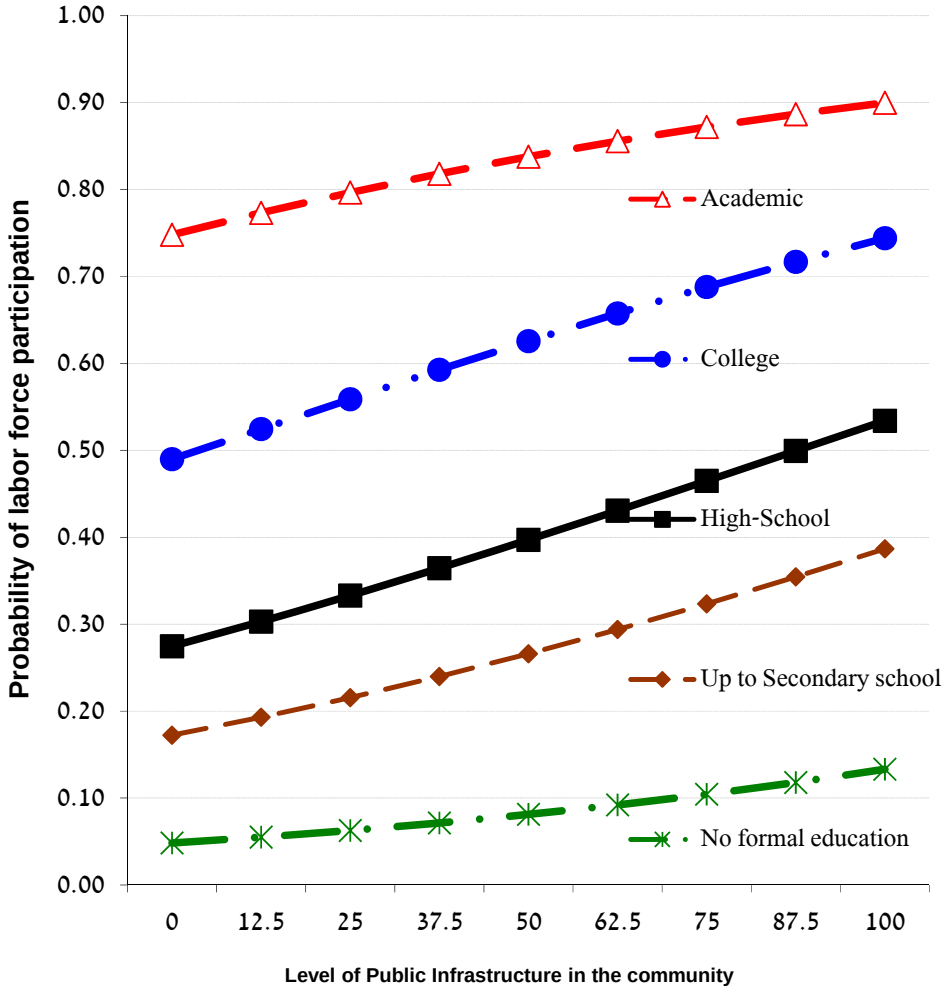
We conclude that infrastructure affects the probability of participation positively and powerfully. This relation is particularly strong for women with secondary education or less. Furthermore we observe that the chances of employment are affected particularly strongly by infrastructure between the levels of secondary education and post high-school non-academic education (college or teachers seminar for example). The importance of infrastructure decreases with the level of education (the slope of academic education is lower than that of high school education).

Chart 12 describes the relation between the probability of the woman (with post high-school non-academic education) to participate in the labor force and infrastructure, according to her personal status. The probability of a married woman to participate is considerably below that of an unmarried woman (single, divorced, separated, or widowed), especially in communities with low levels of infrastructure.[54]

Both charts were calculated for a single, healthy Northern Arab woman aged on average 38 years and living in a community of 5,000 to 15,000 persons.

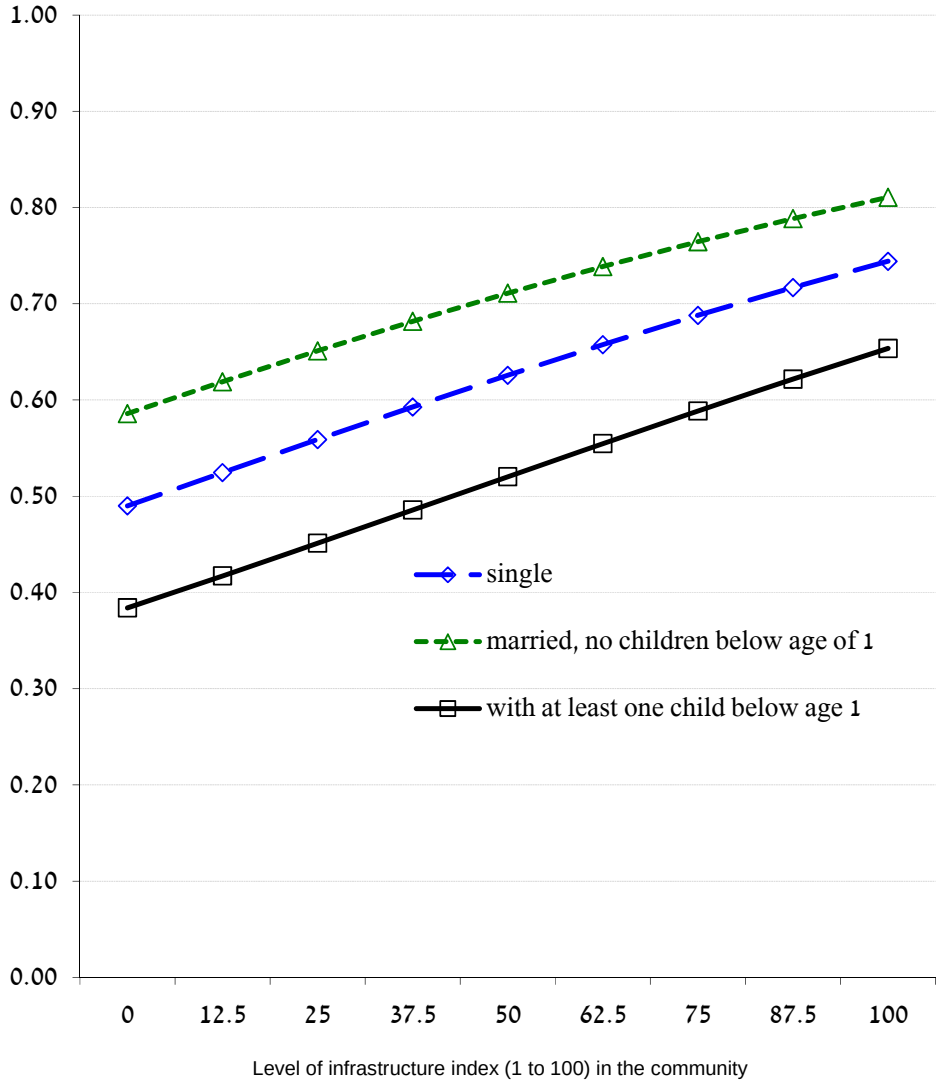
[54] The personal status was not even significant at a significance level of 10%. Children to the age of one year for a woman further reduce the woman's chances to participate in the labor force.

Chart 11:
The Effect of Infrastructure on the Probability of Labor Force Participation of an Arab woman – by the Level of Education



An important conclusion from this illustration is that while for women with no formal education the inadequacy of public infrastructure hardly matters, since the slope of the probability curve is shown to be not only at a low level but also hardly increasing. However, even for a relatively low education, such as up to secondary school, the chances of employment rise considerably by a constant (of more than 10 percentage points). The main point is however that employment chances increase by nearly twice as much with the adequacy of infrastructure (the change due to the slope of the curve).

Chart 12: The effect of infrastructure on the probability of an Arab woman to participate in the labor force – by personal status



e.1 Discrimination

A factor often mentioned in relation to the failure of the Arab population in the labor market is discrimination. (See Sikkuy reports for 2004, 2005) concerning public sector employment. With regard to technologically advanced industries, the reason for low participation of highly educated Arabs are also due to the roots of the development of the High-Tech sector in Israel since the late 1980's. Its development and success are attributed to the sharp reduction in the demand for defense products, both by the Israel Defense Force and by foreign demand, due to geopolitical reasons that occurred at the time. This process had caused a large-scale dismissal of highly educated professionals from big public sector think tanks in fields of high technology. At the same time there was a sharp increase in the demand for knowledge, mainly in the area of non-defense communications. This situation was favorable to the development of entrepreneurship among the many highly educated unemployed during the 1990's (see Justman, 2001).

A number of papers point to the existence of discrimination against Arab workers in the Jewish labor market as reflected in lower employment prospects and salaries among Arabs as compared to Jews, when personal and professional characteristics are held constant. Ruth Klinov (1999) points to the existence of gaps in salaries between Arab and Jewish workers in the same occupation and with similar characteristics of education, work experience, age, and other factors that influence salaries. Klinov had found that in the years 1996 to 1997 salaries in the Jewish labor market were about 11% higher than comparable ones among Arabs.

Another type of discrimination is found in entrance barriers put before Arab workers in certain occupations and sectors. An Arab worker with a given level of education may be prevented from engaging in an occupation suitable to the available skills. Such a worker may thus be forced to choose work in a less profitable occupation or remain unemployed for a longer period than a Jewish colleague. An indication for such discrimination is given by the share of Arab academics who are employed in a profession that is below their educational achievement. We found that in 2004 this share was 17.3% among the general Arab population, 22.5% among men and 9.7% among women (Table 10). This phenomenon is mostly absent among women in the South. However, we note that the main field of employment for Arab academics in the

South is in teaching: 74.7% of all employed Bedouin academics work in education. Among women the share rises to nearly 100%.

Asali (2006) examined the salary gaps between Jews and Arabs during the period 1990 to 2003. The overall gap per hour worked nearly doubled from 40% the salary of a Jew in 1990 to 77% in 1999 and dropped to 56% in year 2003. Asali then decomposed the overall gap into three components – human capital, employment segregation and a residual.[55] The residual may be interpreted as an estimate for wage discrimination. He found that the gap in salaries had nearly doubled in the period 1990 to 1999. The component attributed to discrimination had risen from 22.3% in 1993 to 37.9% in 1999. Beginning in year 2000 the trend was interrupted and the total salary gap began to decrease to 40.2% in 2003, about 13% reflecting discrimination.

Table 10: People with Professionally Inadequate Employment (percent)

Education	Total	Muslims				Druze	Christians
		Non-recognized Bedouin	Recognized Bedouin	Bedouin (total) including the North	Non – Bedouin		
Men and Women							
Academic	17.3	2.1	0.0	4.0	15.5	37.2	21.1
Post high-school non-academic	17.6	4.8	0.0	1.0	21.6	18.0	12.5
Matriculation	9.6	21.2	0.0	11.2	10.0	9.2	6.8
Men							
Academic	22.5	2.4	0.0	3.2	20.5	52.5	24.5
Post high-school non-academic	28.7	7.7	0.0	2.0	33.7	31.2	23.2
Matriculation	10.7	24.9	0.0	9.5	11.0	11.0	9.7
Women							
Academic	9.7	0.0	0.0	6.1	7.9	0.0	18.9
Post high-school non-academic	3.8	0.0	0.0	0.0	6.0	0.0	0.0
Matriculation	6.1	0.0	0.0	16.1	6.4	3.2	2.7

With academics, an unsuitable occupation is any occupation not defined as an academic occupation or a freelance and technical occupation according to the classification of occupations of the CBS (1994). For people with a post high-school non-academic education, an unsuitable occupation is any occupation which is not academic, not a freelance and technical occupation, an administrative occupation, or clerical work according to the CBS classification. Among matriculation graduates we defined unsuitable work as unskilled work.
The source of data for calculation: the GS.

[55] Segregation reflects a preference of certain sectors. It is thus possible that segregation itself includes an element of discrimination by causing a reduction of the range of occupations to which young people will aspire given their perception of slim chances of success.

The segregation component ,which reflects a preference (or prevalence) of certain sectors by Arabs, remained stable throughout the period under review, but its portion in the entire gap developed in a direction opposite to the trend of the general salary gap. 44% of the salary gap in 2003 can be attributed to segregation in occupation. It may indeed be that segregation (i.e. the concentration of Arabs in certain occupations and sectors) in itself is influenced by the discrimination against Arabs. According to such an interpretation a substantial part of the gap in salary and occupations can be attributed to discrimination, in both salary and occupation. Discrimination has negative implications on the incentive to invest in human capital, since it causes a reduction in the expected rate of return from human capital and thus affects negatively the incentive to invest in human capital. It should therefore be of major concern to policy makers who believe in the power of the labor market to reduce inequalities. Clearly our other results above relating to fertility and young women's education amplify the importance of reduced discrimination importantly, since the implied expected reduction in family size from higher investment in human capital is reinforcing extrication from poverty.

Lewin-Epstein, Semyonov and Al-Haj (1994) found that occupational inequality between Jews and Arabs had grown over time, resulting in an over-representation of Arabs in blue collar occupations and in services. Bar-El (1993) notes that the significant improvement in education of the Arab labor force is not sufficiently reflected in the distribution of occupations among Arabs, since it should have caused a more significant weight of occupations with a higher earning potential. According to Gera and Cohen (2001), the discrimination in occupations constitutes a major problem for Arabs with high skills for technologically oriented jobs. This type of discrimination is often related to security problems, given the high share of defense oriented jobs. The authors find that this situation negatively affects the incentive of Arab students to attain academic degrees and raises the number of mismatched employment among highly skilled workers, thus earning salaries below their potential. A further important reason for low wages among Arab workers is related to the government's foreign workers policy: The sharp increase in the number of foreign workers in Israel, especially since 1993, combined with a low compliance of employers with the labor laws, especially concerning foreign workers, has caused

downward pressure on Arab workers' salaries.[56] An additional influence to the detriment of Arab workers' employment situation, including the highly skilled, was caused by the structural reduction in domestic labor demand in traditional sectors, due to the relocation of a large part of unskilled labor-intensive industries to countries with low labor costs, in consequence of which unemployment and exit from the labor force among Arab workers increased.

Gera and Cohen (2001) examined the sources for occupational inequality in the Israeli labor market between Jews and Arabs. Their findings point to the fact that an Arab intellectual's prospects to find work in an occupation suitable to his education is much lower than those of a Jewish worker with similar characteristics. Generally, their results point to enhanced integration of the Arab population in the Israeli labor market, an integration that, among other things, expresses the change in the occupational composition and sector composition of Arab workers. These changes are expected to reduce discrimination over time. The trends reflected in rates of employment and unemployment and in distribution measures of occupations and salaries point to reduced opportunities for Arab workers compared to their Jewish counterparts, thus expressing substantial economic inequality.

F An empirical examination of the determinants of poverty among Arabs

In recent years a number of researches have examined the probability of a household to live in poverty. Obviously, such research is sensitive to the poverty definition that is chosen. When using the GS database we employ the NII's relative half-median approach, since at this stage the GS database does not allow for alternative poverty calculations.[57] We follow common practice by using a logistic functional form to represent the probability of a household living in poverty. Such an approach is used for example in Kyereme and Thorbecke (1991) who analyze poverty by use of cross-sectional data for households in Ghana. They use the gap of a household's calories consumption from a nutritional-normative level of calories as an indicator of poverty and try to explain it by economic, demographic, and geographic variables. Rodriguez

[56] See Gottlieb (2002).

[57] The alternative definitions in section C are all calculated, based on CBS data which allow for the calculation of additional poverty measures. However, as mentioned earlier, their disadvantage is that the CBS ignores the existence of the Bedouin living in non-recognized villages.

and Smith (1994) use also a logistic regression for poverty estimation in Costa Rica and Coulombe and McKay (1996) adopt a similar approach for Mauritania based on household surveys made in year 1990.

The main findings in this literature are (1) a significant negative relation between poverty and the level of education of the household head, (2) a positive relation between poverty and the dependency ratio or family size, and (3) a positive relation between poverty and living in the periphery.[58] (4) The state of employment of the household's head, (5) the number of other income earners in the home and (6) the occupation of the household's head and (7) gender (household head being a woman) were also found to be of relevance.[59] A number of papers explain poverty *inter alia* by (8) the household's access to basic infrastructure. This was typically examined with regard to very poor third world countries.[60]

For the Israeli economy, empirical research on poverty has been carried out by Shaayo and Vaknin, 2000, who analyzed persistent poverty and by Flug and Kassir, 2001, who analyzed in particular the role of labor force participation. The situation of single mothers was discussed in Flug, Kassir and Meidan, 2005. Silber and Sorin, 2006, and with Deutsch, 2006, analyzed the issue of dimensions of poverty in a multi-dimensional view. Gottlieb (2007) analyzed poverty and labor market behavior of ultra-orthodox ("Haredi") Jews in Israel.

f.1 Empirical results

The purpose of our empirical analysis is, among other things, to examine the importance of the above mentioned variables, typically used for explaining poverty. More specifically we include age and age-squared[61] of the head of the household, geographic area she is living in, her education, trade and gender, the number of income earners, and for the first time, at least in the Israeli context, we add the household's access to infrastructure as an explanatory variable.

[58] See for example Geda A., Niek de Jong, Mwangi S. Kimenyi, and Germano Mwabu, 2005.
[59] See for example Benhabib Abderrezak, T. Ziani, and S. B.-E. Maliki, 2006.
[60] Respective examples are the papers of Q. T. Wodon, 1998; Datt, Simler, Mukherjee and Dava, 2000, as well as Datt G. and Dean Jolliffe, 2005. Many of these researches use the FES definition of poverty (see section C' above).
[61] This is often done to account for the nonlinearity in the age variable.

Empirical results are presented in Table 11. The second model expands the first (which resembles the standard models found in the literature) by adding a variable of households' accessibility to infrastructure.[62]

Our findings show that the chances of a household to be poor fall with age. The coefficient of age squared, though negative, as expected, is not statistically significant at the level of 10%.[63]

Unsurprisingly, family size significantly raises the probability of living in poverty (Chart 13). Family size affects the probability of being poor both directly and indirectly: the direct effect is due to the fact that a given income is divided among a higher number of people the larger the household size. The indirect effect is due to the interaction between family size and the supply of working hours of the household as a whole, either due to the need to take care of the small children or elderly parents living in the household.

The head of the household being female was also found to be significant. This result reflects in particular the economic pressure on single mothers, being the single potential or actual adult provider. Possibly this might also reflect discrimination in the labor market against women, either through a negative premium on the wage or through a higher probability of involuntary part time work.[64] However, we did check whether this result interacted with the type of occupation and the level of education of the head of the household. We found that it was not affected by them.

The level of education (years of schooling) was found to be a highly significant explanatory variable of the probability of poverty. Notwithstanding, illiteracy (zero years of study) in contrast to a small number of school years (1 to 8 years) was not found to add to the explanatory power of the regression. This finding fits the fact that those employed with up to 9-10 years of schooling typically work in low-paid jobs for the unskilled, and due to other reasons described above they may even face workers with higher education competing for jobs, suitable for unskilled workers.

Secondary education significantly helps to reduce the chances of poverty. Post high-school education helps more than secondary education, and academic education importantly reduces the chances of being poor.

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[62] Variables with a significance level above 10%, except for the Area- variable, were omitted from the Table.

[63] Such a result, which is consistent with the life-cycle hypothesis, was significant in part of the regressions, but not in the ones presented in the table.

[64] These issues have not been studied in this work.

The triangular relationship between the level of education, the occupation of the head of the household and the chances of being employed is salient. Academic education yields a very high chance of being employed. Among women the probability exceeds 90%. Furthermore, academic education provides a higher earnings potential even when the employment is in a job requiring lower skills, probably reflecting the lack of opportunities for above average skills.

The number of income earners in the household is found to be a significant variable. The existence of additional income earners sharply reduces poverty. In Arab households there are fewer income earners per capita than in Jewish households, mainly reflecting the low employment rate among women. Arab families' dependency ratio is also higher. As mentioned above, gaps in education and professional skills, but also lack in infrastructure and possibly discrimination in the labor market for high-skilled workers create barriers to an improved integration of Arabs in the labor market in Jewish areas.

The occupation of the head of the household constitutes a central factor in determining the probability of a household to live in poverty. As expected the chances of a family with the head of the household being in a managerial occupation are very low. The probability of poverty drops also if the head of the household not only holds an academic degree but also works in an academic job. The probability of living in poverty increases if the head of the household is employed in industry or construction.

The location of employment is found to influence the probability of living in poverty: Employment within the community raises the probability, probably due to the lower level of wages within the community than compared to that outside.

As mentioned above in the logistic model the coefficients do not allow for a direct interpretation in terms of the marginal contribution of a specific variable to the probability in question. An example of such a marginal influence on the probability of living in poverty is depicted in chart 13 for the variable of family size, based on the regression in table 11. The other variables are held constant at the average of each of the other variables in the regression. For binary ("dummy") variables the level is either 0 or 1.

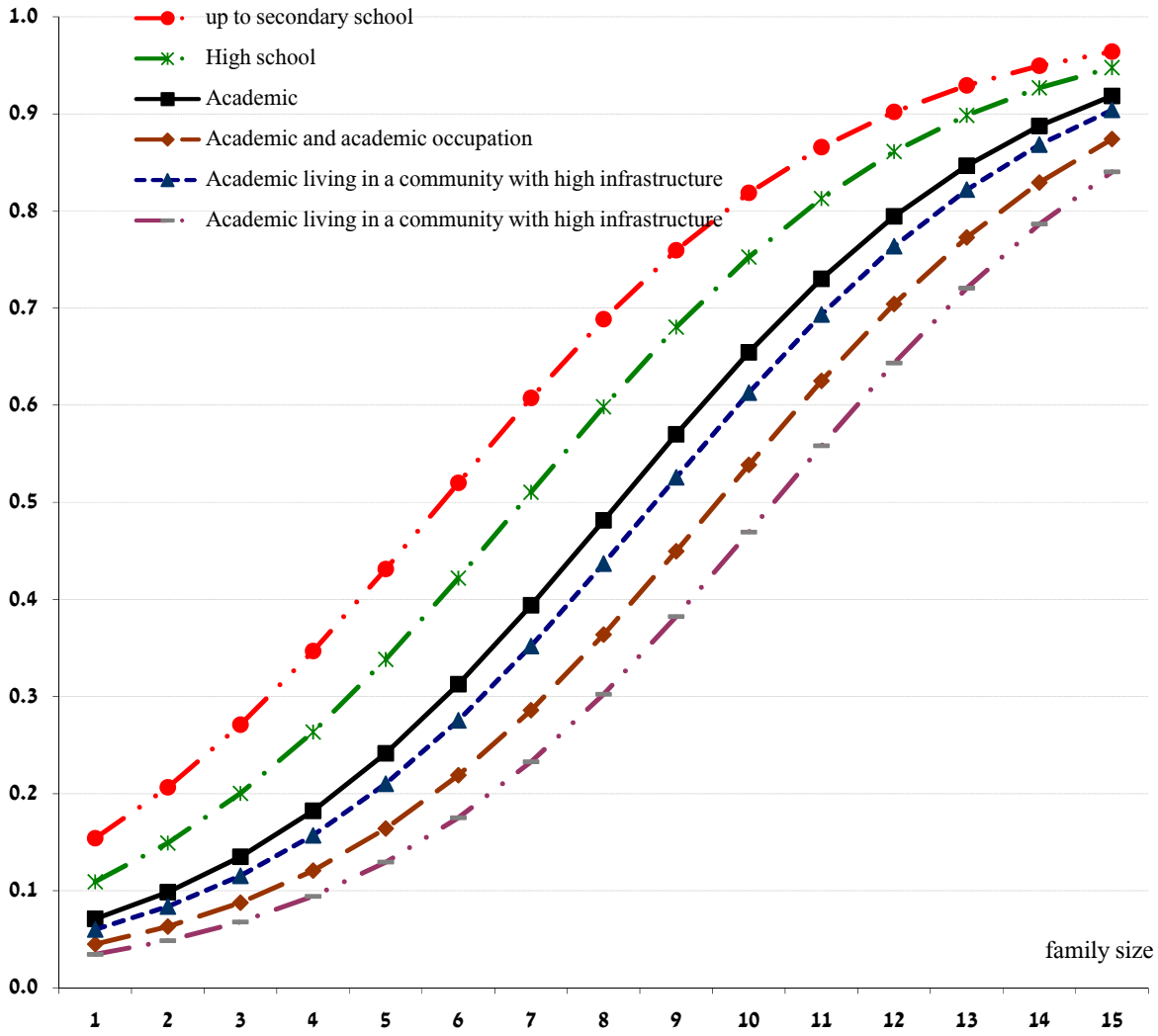
The chart shows that at any given family size the probability of the household to live in poverty falls with the level of education. The largest reduction in the probability of being poor due to a rise in the level of education occurs in families sized 6 to 8

persons. The two bottom lines in the chart show the importance of the access to infrastructure to poverty reduction: if the access to infrastructure is improved from an intermediate level (75 points out of 100) to the top level, the probability of a household to be poor drops by some 8 percentage points. This implies an elasticity of about one quarter. However this elasticity reflects only a partial effect of the full infrastructure effect on poverty, since we showed above that infrastructure will reduce the children's probability of dropping out of the education system. As a consequence the improved educational achievement among girls will in the medium run translate into a lower rate of fertility among women (see discussion above).

Table 11: The Probability of a Household to live in Poverty [£] - a Logistic Model

(A Logit model, below the poverty line = 1, above the poverty line = 0)		
The name of the explanatory variable	**Model 1**	**Model 2**
Constant	-0.10	0.79**
Age of the household's head	-0.02***	-0.02***
Family size	0.36***	0.36***
A household headed by a woman (1 = yes, 0 = no)	0.37**	0.37**
Secondary education of the household head (1 = yes, 0 = no)	-0.41***	-0.40***
Post High-school education of the household head (non-academic) (1 = yes, 0 = no)	-0.90***	-0.87***
Academic education of the household head (1 = yes, 0 = no)	-1.39***	-1.35***
One provider in addition to the household head (1 = yes, 0 = no)	-1.12***	-1.10***
Two income earners in addition to the household head (1 = yes, 0 = no)	-1.90***	-1.88***
A mixed community (1 = yes, 0 = no)	0.31**	0.38**
Household head employed within the community (1 = yes, 0 = no)	0.34***	0.36***
Household head is chronically ill (1 = yes, 0 = no)	1.01***	1.02***
The community is located in the Center of Israel (1 = yes, 0 = no)	0.04	0.10
A non-recognized Bedouin community of the South (1 = yes, 0 = no)	0.39***	-0.20
A recognized Bedouin community of the South (1 = yes, 0 = no)	-0.18	-0.20
An academic occupation (1 = yes, 0 = no)	-0.72***	-0.72***
A freelance occupation (1 = yes, 0 = no)	-1.10***	-1.08***
A professional occupation (1 = yes, 0 = no)	-1.04***	-1.02***
A non-professional occupation (1 = yes, 0 = no)	-1.02***	-1.00***
Access to infrastructure (10 types of infrastructure, index 0-100)	--	-0.01***
McFadden R-squared	0.2612	0.2638
Number of observations with the dependent variable=0	1644	1642
Number of observation with the dependent variable=1	1518	1581
Percent of accurate observations (dependent variable=0)	76.46	77.77
A percent of accurate forecast (dependent variable=1)	70.75	71.15
A percent of accurate forecast (total)	73.72	74.59
The source of data for calculations: the Galilee Society survey, 2004 [£] according to the relative approach of half the median net disposable income. *,**,*** indicates significance at levels of 10,5, and 1 percent respectively.		

Chart 13: The Probability of a Household to live in Poverty – by Household Size and Household head Education level



Background data: the head of the household is a 46 years old man (the average age) who is employed in a professional occupation (exclusive of the third graph from the bottom), a single provider, free of illnesses, lives in a community which is not mixed, employed outside the community he lives in, and lives in a community with a medial level of infrastructure (10 types).

G Concluding remarks

In this paper we examine the socio-economic situation of the Arab-Bedouin population of the Negev and compare it to the situation of the rest of the Arab population in Israel. The Arab society in Israel is living in economic and social conditions that are seriously inferior to those of the Jewish society. The majority of Arab communities are rated at the bottom clusters of the socio-economic index

published by the Central Bureau of Statistics. This situation is strongly reflected in poverty data calculated here, using the unique data set of the Galilee Society for the year 2004 and using CBS data for analyzing trends. Over the period of nine years, the severity of poverty in the Arab society (measured here by the Sen-Index, which combines poverty incidence, the income gap, and the Gini coefficient of inequality among the poor) registered an upward trend and was on average about three times higher than the comparable figure in the Jewish (non-ultra-orthodox) sector. In year 2004 poverty incidence among persons was 52% and poverty severity according to the Sen-Index was more than 4 times that prevailing in the Jewish population. The situation is quite similar when using an alternative definition of poverty (FES) which may be interpreted as stressing persistent poverty, since it reflects a basic needs approach resting solely on data of consumption expenditure.

The database enables for the first time a comprehensive analysis of the socio-economic situation of the entire Arab-Bedouin population, i.e. including the residents in villages not recognized by the state. This population's situation is particularly harsh for both poverty measures, with poverty incidence by the relative (half-median) measure reaching nearly 80% in 2004. The severity of poverty among the non-recognized Bedouin was about 7 times higher than that of the Jewish (non-ultra-orthodox) population. An empirical analysis of poverty indicates that similar to findings from international poverty research, the probability of living in poverty in the Arab society is well explained by the standard variables such as gaps in education, the age of the head of the household, family size and the low number of income earners. A major innovation of this paper is in the quantification of the relevance of access to public infrastructure in Arab communities. This variable examines the household's access to a wide variety of services which are vital for daily functioning. Such basic infrastructure barely exists in the non-recognized villages but is also below full access in most Arab communities.

The lack of access to infrastructure affects poverty both directly and indirectly: It is shown to affect dropout rates from the education system negatively and also worsens the chances for employment. The negative effect on educational achievements on girls has an additional expansionary effect on fertility in the medium run and thus on persistent poverty. These effects raise poverty and perpetuate the dependency of the residents on the welfare system. The sharp worsening of the social security net in

Israel’s social policy in the years 2002-2004 has sharply raised poverty incidence and poverty severity in the Arab society. The adverse effect is particularly strong since the high rate of child poverty combined with the problems in education infrastructure implies that their poverty will eventually become a persistent phenomenon due to the effect on the children's future earnings capacity.

The shortage in public transportation infrastructure is particularly regressive, since it affects poorer households more strongly than others, given their low rate of ownership of private cars. The lack of the government’s resolve to improve infrastructure in Arab communities thus create a particular disadvantage among the poor, pushing them deeper into poverty and lowering their participation in the labor market. The adverse effect of a reduced access to public infrastructure is even greater, since such government policy sends a negative signal to domestic and foreign private and corporate investors. These results present a challenge to governments which declare enhanced labor force participation as their top priority.

A positive aspect found in this study is that the rates of school enrollment (the rate of students in proportion to the population at the relevant age) have been improving consistently over the generations, especially among women. As a result, the educational gap has been reduced both by gender and by age groups.

One might have expected that the urbanization initiated by the government several years ago among the Bedouin of the South should have created a wider array of employment opportunities, particularly in other than the traditional sectors. However, the insufficient access to basic public infrastructure has created a significant barrier to the labor force participation of women and had thus worsened poverty and its outlook. The weak state of infrastructure was found to have had negative influences on dropout rates from the schools. Also found was an indirect influence of the accessibility to infrastructure on fertility, since the influence of dropping out from school reduces the well know influence of female premarital education on fertility, thus reducing the leverage of the positive effect that female education could have exerted on poverty.

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I. Annexes

I.1. Tables Annex

Table – Annex 1: Main Indicators by population Groups

Accommodation (households)								
	Non-Bedouin Muslims	Bedouin	Christians	Druze	Recognized Bedouin	Non-recognized Bedouin	Bedouin of the South	Recognized Bedouin of the South
The average number of individuals per room	1.21	1.61	1.03	1.05	1.53	1.80	1.64	1.55
The average number of rooms in a residential unit	4.03	4.05	3.83	4.41	4.31	3.52	4.15	4.61
Household title over a residential unit or tenancy								
Title	91.7	95.9	81.4	98.8	94.4	98.8	95.1	92.4
Tenancy	8.3	4.1	18.6	1.2	5.6	1.2	4.9	7.6
The rate of households that require at least one residential unit in the next 10 years	59.2	71.5	57.3	53.2	72.3	70.0	72.8	74.8
The rate of households which are incapable of supplying at least one residential unit of those required in the next 10 years	26.3	30.5	22.7	23.8	25.5	40.8	27.8	18.5
The type of accommodation								
Villa	7.2	5.6	5.3	10.8	7.9	0.9	3.3	5.0
House	65.9	64.0	41.5	68.7	75.8	39.8	65.4	84.0
An apartment in a building	26.4	5.6	53.2	20.5	8.3	0.2	4.0	6.7
A separate room	0.3	0.2	NA	NA	NA	0.5	0.2	NA
A tent	NA	0.1	NA	NA	NA	0.4	0.1	NA
A shack	0.1	22.2	NA	NA	7.8	51.8	24.2	4.2
Other	0.0	2.3	NA	NA	0.3	6.5	2.7	NA
Connection to public infrastructure								
Water infrastructure (Mekorot Corp.)	99.9	84.9	99.3	100.0	96.7, 3.3[1]	60.4, 39.1[1]	83.3, 16.4[1]	100.0
Electricity infrastructure (the electric network)	100.0	67.8	99.3	99.5	97.0, 3.0[2]	7.7, 89.4[2]	61.2, 37.6[2]	100.0
Sewage infrastructure (system)	88.4	54.3	99.2	88.4	80.3	0.7	57.3	98.3
Sewage infrastructure (cesspit)	11.2	42.1	0.8	10.9	19.4, 0.3[3]	88.7, 10.6[3]	38.2, 4.4[3]	1.7
Telephone line	74.6	21.3	89.9	88.4	31.3	0.7	11.5	19.3
At least one computer at home	49.9	23.9	56.9	57.4	30.3	10.7	21.6	29.4
Internet service at home	23.8	5.3	45.4	25.2	7.8	0.2	4.5	7.6
Playground or public park in the area	17.3	2.0	30.5	12.8	2.8	0.4	2.1	3.4
Title over a car, library								
A private car	64.2	56.0	63.6	75.4	61.4	44.7	55.8	63.9
A commercial car	9.2	5.7	11.4	8.4	5.5	6.0	6.4	6.7
A library at home	32.6	15.5	44.9	48.2	19.1	8.1	15.6	21.0

	Non-Bedouin Muslims	Bedouin	Christians	Druze	Recognized Bedouin	Non-recognized Bedouin	Bedouin of the South	Recognized Bedouin of the South
Relocation, confiscation, and demolitions								
The rate of people relocated from their original place of residence in Israel	16.5	17.9	14.5	0.1	20.7	11.6	22.7	30.5
Confiscation of property since 1947	22.6	32.4	18.6	27.2	29.3	38.7	37.2	36.1
Demolition of buildings in the recent 12 month	0.1	1.7	NA	NA	0.6	4.0	2.2	0.8
The number of demolitions	161	604	NA	NA	139	465	604	139
The rate of demolitions out of the total number of residential units' owners in the sector	0.2	1.9	NA	NA	0.7	3.9	2.3	1.0
Kinship between married women and their husbands								
First degree kinship	20.4	34.1	11.4	28.5	31.8	39.3	37.4	35.7
Other degree of kinship from the same clan	15.8	27.4	7.2	13.5	25.3	32.8	26.9	23.2
Comments:								
[1]special connections	[2]A generator	[3]None						
Household Families	p Details							
Source of data: the GALILEE SOCIETY survey								