

Executive Summary

The Impact of Institutional Allocation of Inputs
on Agricultural Efficiency

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Directed by the Milken Institute Israel Center, the Milken Institute Fellows Program awards annual fellowships to outstanding Israeli university graduate students. Through the Milken Institute Fellows program, we train some of Israel's best and brightest young professionals in creating pragmatic financing and economic policy solutions, and they deploy them as resources to government ministries, nonprofits and other key organizations. Our applied research and Financial Innovations Labs® are a launching pad for transformative change, using innovative financing mechanisms, programs and policies to bridge social, regional, economic and productivity gaps within Israel and between Israel and the world.

In addition, Fellows craft their own policy studies during their internship aimed at identifying barriers to job creation and capital formation in Israel. The Fellows' research, carried out under the guidance of an experienced academic and professional staff, support policy makers who shape economic reality in Israel. The program offers the ultimate training opportunity, combining real-life work experience with applied research.

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In the early years after Israel's establishment, the importance of agriculture was vast. Not only did it provide a livelihood for many residents, it was a source of national pride: Agriculture in the early 1950s accounted for about 11 percent of GDP and about 63 percent of total exports (Bank of Israel, 2011).

In recent decades, numerous changes have occurred in the institutional environment in which agriculture operates in Israel. These include the cancellation of central planning in most areas of the industry, the liberalization of the marketing and export systems, the weakening of the cooperatives, among others. In contrast, three main inputs of agricultural production continue to be allocated as they have been in the past; namely, land, water, and foreign workers. However, over the years, the institutional allocation arrangements have eroded, in some cases resulting from liberalization initiated by the institutions themselves (for example, permits for partial mobilization quotas for exceptional water or land). In other cases, the causes may be attributed to partial enforcement and the difference between the allocations *de facto* and allocations *de jure*. The main input factors in agriculture are land, labor, water, and capital, all of which are in limited supply. This work addresses the first two factors. Land to be used for farming is determined by the designation of agricultural areas within Israel's borders, and our analysis shows that farmers increasingly need more land than allocated. The structure of the workforce, meanwhile, has changed dramatically over the past decades. When Israel was established, most engaged in agriculture were independent. Today most are salaried employees, including foreign workers, especially from Thailand (OECD, 2010). The Israeli government is trying to reduce the employment of foreign workers in agriculture to promote the employment of Israelis.

In light of the arrangements specified, and the changes during the last years, this study will use the data from the "Censuses for Foreign Workers (2006-2012) to deal with these key questions: Does the regulated system for the allocation of land and workers affect economic efficiency and how? And further, does this system serve and advance the strategic goals of the Ministry of Agriculture and rural development as a whole?

This research aims to do the following:

A. Prepare a database using information from the four Censuses for Foreign Workers (2006-2012).

B. Expand on the work of Rophe (2012), and analyze the variance of the sizes of the cultivated agricultural land.

C. Recommend further areas of research.

With regard to the database, the information on various crops falls under six categories: citrus, orchards, vegetables in greenhouses, vegetables in open fields, flowers, and field crops. Farmers were classified under two main groups according to the applicant's community; namely, "collaborative" or "family/private."

The data presented in the study refer to farmers who applied for foreign workers from 2006 to 2012, in which they annually report all of their agricultural matters for the preceding two years.

The areas which were reported represent only one-third of agricultural land in Israel, but this land undergoes more intensive farming, requiring greater capital investment and high labor inputs.

Out of the analysis of the data, we found that the percentage of farmers who currently cultivate land outside their settlement areas stands at 18.3 percent, while the amount of agricultural land which they cultivate outside their settlement was 33 percent in 2012, compared with 18.6 percent in 2006. (See Chart)

Percentage of farmers who cultivate outside their settlement, and the percentage of the cultivated land outside the settlement of the farmer

Blue line: Percentage of farmers who cultivate outside their settlement

Red Line: Percentage of cultivated land outside the farmer's settlement



These figures are evidence of a problem: The land allocated to farmers is not sufficient for their livelihood. The family/private sector cultivates 65 percent of the land compared with the cooperative sector, which cultivates 35 percent. This trend has remained unchanged over the years. It was also found that in 2012, 46 percent of farmers cultivate only 6 percent of the land, or alternatively, 19 percent of the farmers cultivate 78 percent of the land.

Total percentage of farmers, by the size of their cultivated land, in dunam, from 2012 census

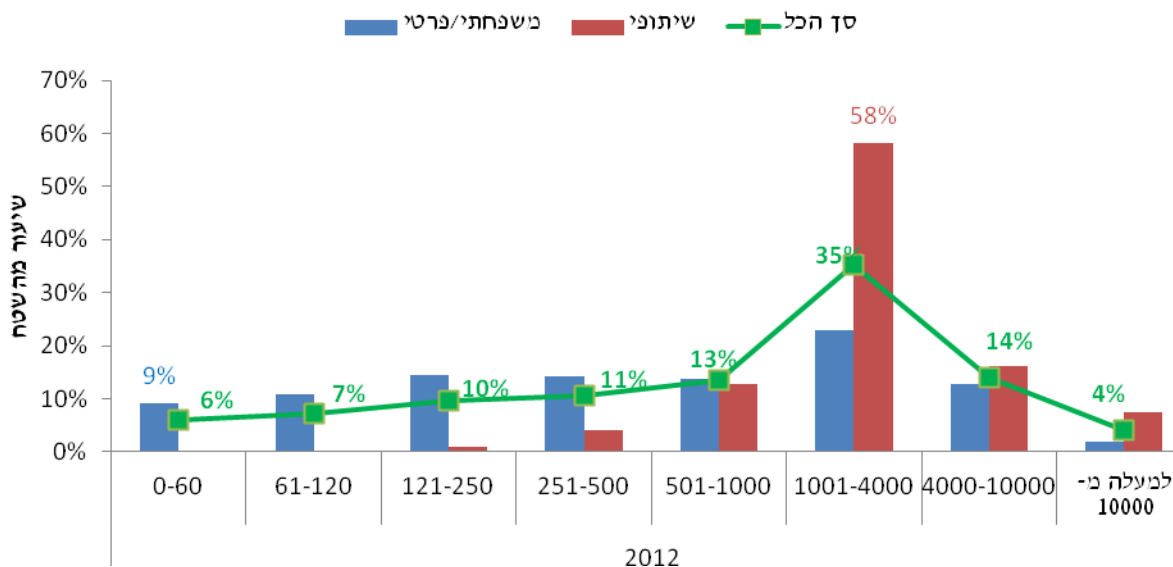
Year 2012	Land, in dunam
46%	0-60
21%	61-120
14%	121-250
8%	251-500
5%	501-1000
5%	1001-4000
1%	4000-10000
0%	More than 10000
100%	Total

Cultivated land, by size, according to 2012 census

Green line: Total sector

Red line: Cooperative sector

Blue line: Family/private sector



As time passes, the average size of cultivated units increases. With the rise in the average size of a cultivated land unit, the number of active farmers is reduced. An analysis of census data shows that the number of requests for foreign workers decreased from 5,500 applications in 2006 to 4,560 applications in 2012.

Although Israel uses a “central planner” model of managing the agricultural industry, allocating land as part of its operation, the study’s findings have found that, in practice, there is evidence of market forces causing an increase of the land cultivated by farmers opposed to the country’s initial allocation. Although the law makes it difficult to increase the cultivated land by a single farmer, one can eventually do so, given that enforcement is lacking. The need to increase the individual farmer’s cultivated land does exist, as it is driven by demand and represents efficiency and the need for economies of scale.

Recommendations

We propose a strategic decision be made to establish a minimum number of active farmers in the industry; this minimum would help ensure that vast amounts of land are not cultivated by a relatively small number of farmers—a scenario that would have adverse economic effects such as higher consumer prices. Without intervention, it is likely that the average land size cultivated by a single farmer will increase, given the strong trend in this direction. The central planner must examine its land policy in Israel today, considering how market forces are influencing agriculture in ways significantly different from the initial allocation provided in the establishment of the state. What has worked in the past does not necessarily address the challenges facing agriculture and farmers today.

Recommendations for further research

For more than three decades, there was no official agricultural census in Israel. We believe that the Census for Foreign Workers is the most abundant source of data that exists for single agricultural farms. This database has great potential for further study. In the next stage, we can use the observations to create a “panel data” and examine the behavior of the single individual farmer over the entire agricultural census years. With profits data, it will also be possible to create an estimate of income from agriculture based on financial statements and examine the distribution of income by various criteria. There is also potential to study the effect on profit and economies of scale and analyze the data by using regression techniques to estimate the extent of economies of scale, the regulatory impact on profit, and the value of the marginal product of foreign workers in agriculture.

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