with Europe, however, government corporations in Israel have not yet been privatized, and the government-owned IAI even purchased 30 percent of Elisra, which is a private company.

3. Agriculture

The product of agriculture rose by a moderate 0.9 percent in 2002 (Table 1.22), alongside a decline in exports. Agricultural output dipped by 0.3 percent, and inputs declined by 1.3 percent. The industry accounted for 2.7 percent of business-sector product in 2002, and the number of persons employed in it remained virtually unchanged.

The product of agriculture rose by a moderate 0.9 percent in 2002, alongside a decline in exports. Agricultural output dipped by 0.3 percent, and input by 1.3 percent. The number of persons employed remained virtually unchanged.

In the last few years the growth rate of agricultural product (excluding afforestation) has been slightly higher than that of the population: in 1997–2002 agricultural product rose by an annual average of 3.7 percent, while the population grew by 2.3 percent. Domestic demand for agricultural product has risen in step with population growth, and the effect of the recession on it has been limited. Because of administrative restrictions, most imports of agricultural products are in categories not produced in sufficient amounts in Israel.[23]

Production for export, which constituted 20 percent of agricultural output, similar to its rate in previous years, fell by 6.5 percent in volume terms. Most exports were of crops, which are subject to wide fluctuations, but most of the decline in 2002 was due to the long-term downward trend of citrus exports, which intensified this year because of accelerated uprooting of orchards. This development has expanded, for several reasons: the greater alternative return on land in the Sharon region, the higher price of water, and the erosion of prices. Despite the volume reduction, export revenues have risen as a result of the price rise due to local-currency depreciation.

Production for export, which constitutes some 20 percent of agricultural output, declined by 6.5 percent in volume terms.

The long-term trend of deterioration in the industry's 'terms of trade' and increase in productivity persisted in 2002. The price of agricultural input continued to rise more steeply than that of agricultural output, exceeding the rate at which the CPI rose, primarily because of the increased cost of water to agriculture, while prices of output fell more sharply than the CPI. Labor input in the industry declined by 0.8 percent in 2002, capital input rose by 0.4 percent, and total factor productivity (TFP) was up by 1.2 percent. Labor productivity in agriculture in the short run is subject to marked shifts due to inclement weather, although its long-term impact is small. In 1995–2001 labor productivity rose by an annual average of 4.1 percent—far beyond its increase in the business sector. This was due *inter alia* to the reform of the livestock industry—which is internalizing economies of scale—and the shift to larger farms in other industries; output has risen by 7 percent in the last three years, while the number of agricultural enterprises has fallen by 4.1 percent, with considerable substitution.

The long-term trend of deterioration in agriculture's 'terms of trade' and increase in productivity persisted in 2002.

[23] Except for imports from the Territories, most of them vegetables, which account for a relatively small proportion of agricultural imports.

Table 1.22
Indicators of Agricultural Activity,[a] 1987–2002

(annual rates of change, percent)

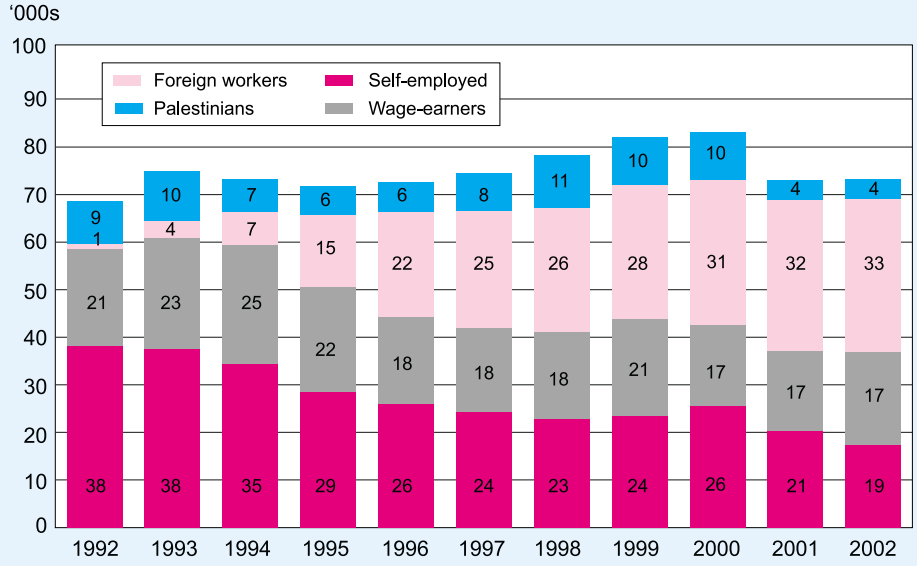
	Average											
	1987–90	1991–94	1995–98	1999–2001	1995	1996	1997	1998	1999	2000	2001	2002
Output												
Total output[b]	3.2	1.9	4.0	1.7	9.8	5.0	–1.0	2.7	–1.7	3.7	3.4	–0.3
Inputs	0.2	1.5	0.2	0.1	5.7	0.5	–1.9	–3.1	–0.1	1.6	–1.1	–1.3
Gross product (excl. afforestation)	6.6	2.3	8.6	3.7	14.4	10.3	0.1	10.1	–3.4	6.1	9.0	0.9
Total farm real income[c]	–3.5	–0.4	0.7	–1.0	4.5	–4.4	–3.8	17.1	–12.5	–4.2	15.6	–4.9
Real income from capital and own labor		–4.1	–4.3	–3.3	–15.1	–17.6	–13.8	39.2	–24.6	–13.6	38.8	–8.0
Factor inputs												
Labor	–4.6	4.0	4.6	–1.3	5.6	4.2	4.1	4.4	6.4	–0.2	–9.6	–0.8
Gross capital stock[d]	–2.1	–3.6	–1.2	–0.5	–2.9	–0.8	–0.5	–0.5	0.7	0.5	0.2	0.4
Capital/labor ratio	2.7	–7.3	–5.5	–1.8	–8.0	–4.8	–4.4	–4.7	–5.4	0.6	10.9	1.2
Productivity												
Labor productivity	11.7	–1.7	3.8	5.1	8.3	5.8	–3.8	5.4	–9.2	6.2	20.5	1.7
Total productivity[e]	10.3	1.4	6.2	4.4	12.0	8.0	–2.1	7.5	–7.2	6.0	15.4	1.2
Total exports[f]	–2.5	3.2	12.4	–3.6	16.9	17.6	8.5	7.1	1.6	–2.6	–9.4	–7.5
Citrus	–4.6	–12.5	3.6	–17.4	36.4	–5.5	3.5	–13.7	–15.5	–21.4	–15.0	–28.5
Other	–1.6	11.9	16.2	–1.2	20.3	22.7	9.8	12.6	5.1	0.5	–8.7	–5.0
Prices												
Output	11.0	8.1	4.9	1.2	1.2	7.3	5.5	5.5	2.2	–1.8	3.2	3.1
Purchased imports	14.4	9.0	7.4	4.0	8.2	17.1	4.7	0.4	6.5	4.4	1.1	6.9
'Terms of trade'[g]	–3.1	–0.8	–2.4	–2.7	–6.5	–8.3	0.8	5.1	–4.0	–5.9	2.0	–3.6

[a] See notes to appendix tables for agriculture.
[b] Calculated at producer prices (including price subsidies).
[c] At constant prices, adjusted by the CPI.
[d] At constant prices at the beginning of the year. Based on Central Bureau of Statistics investment data. The capital stock data in this table differ from those in previous reports.
[e] Weighted by capital and labor in the average ratio of 59 percent labor and 41 percent capital.
[f] Based on data of exports in dollar terms at fixed 1993 prices, excluding exports to Judea, Samaria and Gaza. Sources: Foreign Trade Department and the Central Bureau of Statistics. Differences between data in this table and data on production for export in the Appendix table derive from differences in definition and methods.
[g] Output/input ratio.
SOURCE: Based on Central Bureau of Statistics data.

The long-term increase in the proportion of foreign workers virtually ceased in 2002, and this remained 45 percent.

With regard to the composition of employment, the long-term increase in the share of foreign workers more or less came to a halt in 2002, and they accounted for 45 percent of all employees, i.e., some 32,800 foreign workers, so that the share of Israelis thus remained unchanged. The proportion of Israelis employed in agriculture rose at the expense of self-employed Israelis in 2002, the number of the latter falling by 5.4 percent (Figure 1.24). The long-term decline in the number of self-employed persons persisted in view of the structural and social changes which agriculture has been undergoing for many years—the low return on capital and the trend towards larger

Figure 1.24
Employment in Agriculture in Israel, by Group, 1992–2002



SOURCE: Based on Central Bureau of Statistics data.

farms, utilizing economies of scale. The increase in the number of Israelis employed may stem from the slump in the labor market, as even though jobs in this industry are less desirable, during a recession it is easier to fill them.[24] The number of Palestinian workers remained at the low level of 2001.

The average number of permits for foreign workers in agriculture was up by over 6,200 from 2001—in contrast to its downward trend in the other industries—and averaged some 25,000. The share of foreign workers with permits, about 70 percent of the foreign workers in agriculture, is far higher than it is in other industries. In 2003 an attempt was made to increase the cost of employing foreign workers by imposing an annual 'permit impost' of NIS 1,000 per worker, as well as a 'request impost.' Note, however, that the amount of the annual permit impost is far lower in agriculture than in construction, where it is NIS 4,000.

The real wage of persons employed in agriculture dipped by 3.1 percent, and that of Israelis declined by 3.5 percent, less than in the business sector as a whole—possibly because it was low from the outset. On the other hand, the real wage of foreign workers hardly changed at all (a nominal 5.2 percent rise), as it is indexed to the dollar, which appreciated against the CPI in 2002.

The real wage of agricultural employees declined by 3.1 percent. The real wage of Israeli employees fell by more than that of foreign workers.

Agricultural capital stock has risen by a moderate annual 0.5 percent in the last three years. Gross investment was equivalent to discards, so that the ongoing erosion of capital that has characterized the industry since 1986 was contained.

[24] W.C. Goodman, "Employment in Service Industries Affected by Recessions and Expansions," *Monthly Labor Review*, October 2001, 124(10), 3–11.

Total real income from agriculture declined by 5 percent: the share of wage payments to employees rose, while that of income from own labor and capital fell. The real wage per employee post declined, while income per self-employed farmer rose.

Total agricultural output dipped by 0.3 percent due to the 0.4 percent decline in the output of field crops and stability in that of livestock.

Although the significance of discussing developments in agriculture in a single year is limited because of the industry's unique character, note that in 2002 total agricultural output dipped by 0.3 percent—due to a 0.4 percent decline in the output of crops, which account for 59 percent of output, and stability in the output of livestock. The contraction of crops output apparently stemmed from the higher real cost of imported intermediates, which are a large part of the inputs of these industries, because of the accelerated local-currency depreciation, and the 15 percent nominal increase in the price of water, further to its annual average 7.5 percent rise in 2000 and 2001. The higher price of water has led to a gradual shift to the use of brackish or salt water and to crops which are less water-intensive. Farmers' use of water has become more efficient, so that for each cubic cm. of water they produce far more today than in the past. Examples of this are the transition to industrialized fish-ponds, so that a larger quantity of fish are produced per cubic cm. of water, and a switch to crops such as olive trees that are less water-intensive. Note that farmers do not pay the true price of water, and the reform of the costing system, which was supposed to have priced water for agriculture more realistically, is being held up.

Farmers made more efficient use of water.

Because of the erosion of profit in agriculture, there is a growing shift to niches.

Because of the erosion of the profitability of agriculture there has been a transition to niches. Thus, for example, cultivation of herbs and tropical fish has grown, as has the production of goats-milk and organic farming products. The extent of area given over to organic farming has soared in recent years and now constitutes 1.7 percent of total cultivated agricultural land. In 2000 the organic market accounted for 1.5 percent of global food sales. The revenue of the organic farming industry in Israel was NIS 210 million in 2002—some 1.5 percent of total revenue, compared with NIS 190 million in 2001. Organic food exports also rose, local-currency depreciation against the euro contributing to their profitability.

Government involvement in agriculture

In contrast with other industries, but in line with the rest of the world, there is a high level of government involvement in agriculture.

In contrast with other industries but in line with trends in the rest of the world, agriculture is characterized by a high level of government involvement. This is divided into two main categories—direct (usually budgetary) and indirect, incurring hidden costs to the economy. In accordance with the membership terms of the World Trade Organization (WTO), Israel is gradually reducing tariffs, open and concealed subsidies, and import restrictions on agricultural produce. In the mid-1990s Israel subsidized agriculture to a greater extent than the US, and since then US subsidies have been further reduced. Note, however, that agricultural subsidies in the US are lower than those in Europe, and that the reforms are proceeding slowly globally.[25]

[25] OECD *Agriculture Outlook*, 2002.

Characteristics of government involvement in agriculture

1. *Opening the industry to imports*: the tariff on fresh produce in Israel is 40 percent of accepted production costs—a rate which forestalls imports. In addition, imports are hampered by protective regulations. The average global excise on agricultural produce is 62 percent, although in the US it is far lower.

2. *Zero V.A.T. on fresh fruit and vegetables*: the estimated benefit in 2001, based on data from the State Revenues Authority, is NIS 1.4 billion. Note that V.A.T. on fresh fruit and vegetables is lower in Europe, but not less than 5 percent.

3. *Consolidation of production councils and reduction of imposts*: at present there are four production councils for crops (for vegetables, fruit, flowers, and citrus). Their responsibilities include marketing, instruction,[26] R&D investment by commissioning research, and insurance against inclement weather, and may afford certain economies of scale (e.g., in marketing and insurance). In the past the production councils played an important part in planning, marketing, and sales, but today, after the transition from the centralized planning of agriculture to intervention intended to prevent market failures, their role has been reduced and it is doubtful whether there is any justification for the heavy financial burden they impose on producers. The Ministries of Agriculture and Finance aim to consolidate the various councils, thereby reducing their personnel infrastructure; this process began in 2002 with regard to the fruit and citrus councils.

4. *Business training*: similar to the activity of the Ministry of Industry and Commerce in the framework of the Small Business Development Authority, the Ministry of Agriculture extends business assistance to farms. This is done by means of an outside company, which matches the farmer with a business advisor with whom a consultancy agreement is signed. The Ministry of Agriculture finances 75 percent of the cost, and the total budget for this project is NIS 1 million.

5. *Subsidies*: the extent of the subsidies extended to agricultural output[27] rose by some 29 percent in 2002, to stand at about 3.3 percent of the value of output.[28] According to the National Budget, the amount consists solely of direct subsidies and transfer payments, but this does not include the subsidy implicit in the unrealistic price of water for agriculture. The Ministry of Agriculture extends subsidies for public goods which have a positive external effect, such as grazing land, pest-extermination, marketing abroad, etc. As is customary elsewhere in the world, the Ministry also provides compensation for damage resulting from natural disasters.

[26] Agricultural instruction is conducted via an intermediary—the production council pays the professional training service from the money it collects from farmers as imposts. It is not clear if the training should be done in this way rather than via a direct employment contract between the recipient (farmer) and training professional.

[27] According to preliminary data only; the subsidy may be greater.

[28] Excluding the subsidy on the capital cost of agriculture's share of the water system, and the subsidy implicit in protecting domestic product from competing imports, which has declined in the last few years. Note in the context of exposure to imports that in accordance with the Paris agreements with the Palestinians, quantitative restrictions on imports of agricultural produce from the Autonomy were annulled as of January 1998.

Box 1.5
Agriculture and Water

The price of water to agriculture rose considerably in 2002, continuing the trend of 2001, but at 89 agorot per cubic meter it is still far lower than its marginal cost (some NIS 3 per cubic meter). The subsidy on the price of water to agriculture is not explicit today, and should be expressed in the National Budget, on the basis of the difference between the marginal cost of desalination (NIS 3) and the actual price of water in relation to the amount consumed by agriculture.

The implementation of the reform of the price of water to agriculture, as formulated by the Ministries of Agriculture and Finance, has been delayed because of the opposition of the farm lobby. The object of the reform is to correct the situation in which farmers do not see the true cost of water. This situation causes excessive use of water, and in effect to its export (as agricultural produce). Raising the price of water to agriculture, as proposed under the reform, is consistent with the commendable principle of determining its price in accordance with its marginal cost. The reform would compensate farmers annually in accordance with the area and type of crop cultivated (a larger compensation for water-intensive crops), in order to preserve the national goals of agriculture.

The form of compensation currently employed creates distortions: although farmers who have irrigated their crops to date and will lose because of the reform deserve to receive assistance as their livelihood is affected, the subsidy for cultivating the land will be given to farmers who tend their fields and remain in the industry, although they are not necessarily those who are adversely affected. We therefore propose that farmers who leave the industry because of the higher cost of water should be given assistance, in the form of a non-recurring grant spread over several years. The subsidy for tilling the soil, regardless of the water-intensity of the crop, should continue as long as revenue from agriculture does not ensure that land is cultivated. In addition, specific solutions should be found for outlying settlements whose income is from agriculture. A public committee was recently set up to make recommendations about the price of water for agriculture. Since the committee has to determine water rates for farmers while preserving the full range of agricultural diversity, it is doubtful whether it will be able to raise these rates to the extent required, i.e., bringing them into line with the price confronting other users of water.