

# FOOD PRODUCTION IN TAIWAN R.O.C.

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## INTRODUCTION

Taiwan is located in the subtropics. Its abundant rainfall, warm climate and varied topography offer an ideal environment to grow virtually every tropical and subtropical crop. Taiwan has enjoyed rapid growth in agricultural production over the past 40 years, but in recent years, now that Taiwan has a modern industrialized economy, agriculture on Taiwan has reached a critical turning-point. Agricultural production in Taiwan formerly served as the basis of economic growth. Its contribution to the GDP has fallen drastically, from 32.2% in 1952 to 3.5% in 1992. Agricultural produce and processed food, which were once a major export from Taiwan, have fallen from 95% of the total value of exports in the early 1950s to 4.9% in 1992. Agricultural production in terms of gross agricultural product registered only a 2.2% increase in 1992. Under the government's Six-Year National Development Plan, agriculture is targeted for zero growth until 1997. Agriculture in Taiwan seemingly faces a difficult future.

In addition, the increasing concern over the environmental impact of modern agricultural activities is affecting plans for future production. Hog wastes and pesticides in run-off have severely polluted water supplies; the clearing of land at a faster rate than planting has eroded sloplands and watersheds. Anti-pollution measures have increased production costs. Each year, the treatment of swine wastes alone costs about US\$39 million. Water and soil conservation measures, including flood control and the building of irrigation and drainage systems, are a heavy drain on the government budget.

The sustainability of modern agriculture has become a matter of great concern among policy makers, researchers and farmers in Taiwan. Although at present Taiwan is producing a surplus of many staple foods, production methods make heavy use of agricultural chemicals. There is an urgent need to establish a sustainable agricultural

system in Taiwan.

## FOOD SITUATION IN TAIWAN

### Trends in Planted Area, Production and Yield of Rice

The area planted in rice in 1965 was 772,918 ha. With some fluctuations, it reached a peak of 753,451 ha in 1975, then fell rapidly to 668,823 ha in 1981, 428.93 ha in 1991 and only 397,252 ha in 1992. The total production of rice increased steadily from 1951 (1.4 million mt) to reach a peak of 2.7 million mt in 1976, after which it fell to 1.8 million mt in 1991, and declined even further to only 1.6 million mt in 1992.

Records of per capita rice consumption show little change from 1965 (132.9 kg) to 1975 (130.4 kg). However, the decline since then has been very marked, as improved living standards have led to a change in people's dietary habits. Per capita rice consumption was only 99.4 kg in 1981, and as little as 67.6 kg in 1992. In other words, the fall in annual consumption between 1981 and 1992 was 32%. Although the population of Taiwan increased from 18.1 million to 20.5 million during the same period, rice demand did not increase with the increasing population. In addition, because of high production costs, rice produced in Taiwan is not easy to sell on the international market. Thus, an oversupply of rice has become a serious problem. In an attempt to solve it, the government has implemented a Rice Field Diversion Program since 1977, to convert paddy fields to the production of other crops.

### Production of Domestic Upland Food Crops

Since 1977, under the Rice Field Diversion Program, the government has encouraged rice growers to switch to more competitive and profitable crops such as sorghum, corn and soybean.

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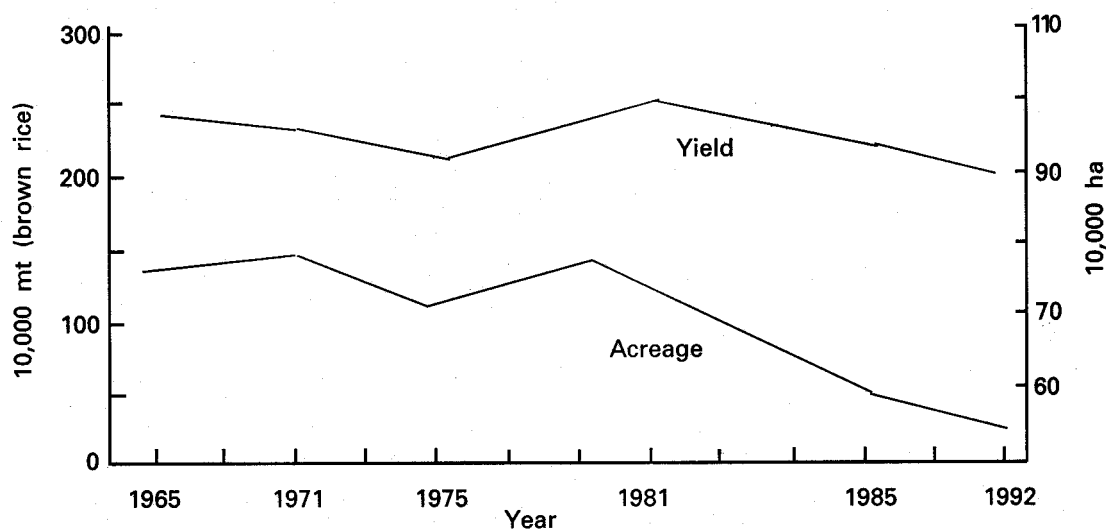


Fig. 1. Rice production in Taiwan, ROC (1965 - 1992)

The area planted in sorghum in 1981 was 3,147 ha, giving a total yield of 12,314 mt. Production reached a maximum in 1988 with 27,255 ha, giving a yield of 117,765 mt, and has since then fallen slightly.

The area planted in corn in 1971 was 22,257 ha. This increased steadily to 35,781 ha in 1981 and 82,858 ha in 1989, subsequently falling slightly. Corn production was 96,226 mt in 1981, and reached its maximum level of 339,436 mt in 1990. In 1992, total production was 338,804 mt.

Soybean is a much less important crop than rice, sorghum or corn. The area planted in soybean in 1961 was 59,582 ha, and has been declining ever since, so that in 1992 it was only 4,195 ha. In the same year, Taiwan's total soybean yield was only 8,000 mt, compared to a maximum of 52,998 mt in 1976.

### Imports of Upland Grain Crops

Although Taiwan produces a rice surplus, other upland grain crops are in short supply. This is because the demand for corn, sorghum and soybean is very high to meet the needs of a flourishing livestock industry. The total amount of upland crops imported in 1976 was 381,200 mt. This increased to 8.5 million mt in 1991 and 8.7 million mt in 1992. Most of this in 1992 was corn (5.3 million mt) and soybean (2.2 million mt). Large amounts of wheat were also imported (see Fig. 2).

### Self-Sufficiency Ratio for Major Foods

The overproduction of rice in Taiwan gave a rice self-sufficiency level of 116.6% in 1981 and 109.5% in 1990. However, the self-sufficiency rate for other cereal grains (wheat, barley, corn, sorghum etc.) was very low, only 2.6% in 1981, 6.8% in 1986 and 8.5% in 1990. The domestic supply of tuber crops (sweet potato, Irish potato, etc.) was sufficient to meet demand until 1989, but became insufficient (89.1%) in 1990.

Vegetable production is in general high enough to meet domestic needs, being 140.7% in 1981, and 110.8% in 1990. Fruit production was also sufficient in the 1980's, but became insufficient in 1990 (91.8%), due to the increase in demand. On average, the self-sufficiency ratio of major foods has ranged between 90 and 94% in recent years (Fig. 3).

### CONCLUSION

With rapid industrialization, the economic importance of agricultural production in Taiwan has fallen dramatically in recent years. From 32.2% of the GNP in 1952, it had fallen to only 3.5% in 1992. The low incomes of farmers compared to urban workers is a long-standing problem. In 1992, the average income of farmers was only 70% of that of non-farmers in Taiwan. There is growing pressure as people become increasingly aware of the environmental impact of modern agriculture. The

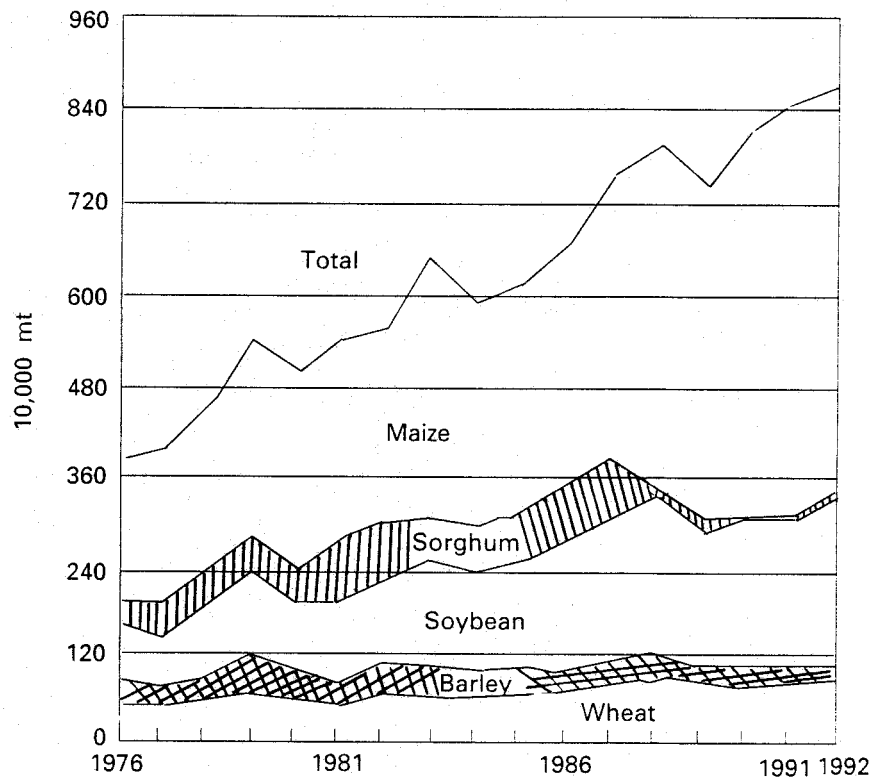


Fig. 2. Imports of major upland crops

Source: Food Bureau, Taiwan Provincial Government

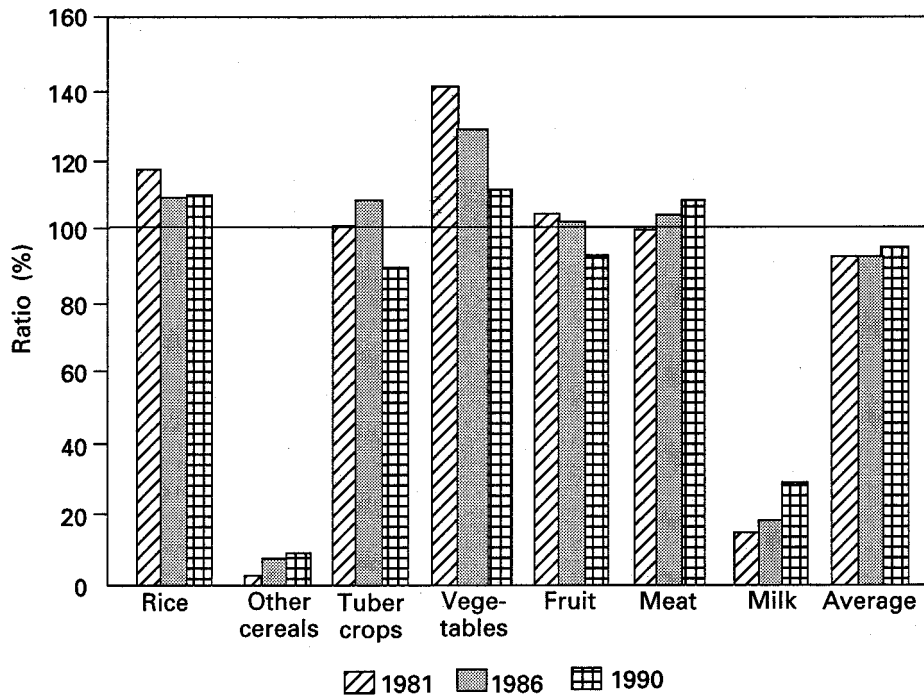


Fig. 3. Self-sufficiency ratio for major foods in Taiwan

Source: Council of Agriculture

agricultural sector in Taiwan should reconfigure into a more cost-effective, market-oriented sustainable system.

Whatever system is adopted, it must be both productive and profitable. To feed over 20 million people from a total of only 900,000 hectares of arable land is a great challenge. A new Regional Agricultural Development Program was launched by the Taiwan Provincial Department of Agriculture and Forestry in July 1991. Its objective is to develop new production systems which use resources efficiently, with a regenerative approach. Attention is given to recycling resources such as organic manure, efficient use of water and fertilizers, and biological control of pests (Sun 1992). In addition, it is common to grow various species of green manure between cropping seasons and on fallow land. Education and extension programs are being conducted for consumers as well as farmers. Only when consumers accept the concept of sustainable agriculture, will there be an incentive for farmers to practice it.

## DISCUSSION

One participant asked why, if organic farming is more profitable than conventional farming, so few farmers in Taiwan have taken it up. Dr. Hsieh explained that this partly because of marketing problems. In USA and Europe, organic produce is usually sold at a price which is 10-20% higher than produce grown by conventional methods. The number of organic farms in Taiwan is still limited, and organic farmers are trying to produce high-quality food that people will be willing to pay a higher price for. The market demand for organically grown produce is good, and many consumers welcome this alternative. However, the risks of organic farming are still high, and there is a high labor input from manual weeding and the application of organic matter.

Dr. Mutert found it difficult to understand the concept of "low-input" agriculture when applied to this type of farming, since high levels of organic inputs were being used to compensate for chemical ones. He suggested that the reality had to be faced, that Asia with its high human populations had to practice high-productivity agriculture, which would also necessarily involve a high level of inputs. He suggested that there can be no such thing as a high-productivity, low-input system. Dr. Hsieh agreed, and felt that in Africa higher levels of inputs are needed than at present. However in Taiwan, with its rice surplus for which there is no market, farmers should emphasize high quality rather than high productivity. He pointed out that there are also some practices such as minimum tillage which do reduce the labor input. Dr. Saleem Ahmed suggested that instead of "low-input", the term "low synthetic chemical input" be used, in view of the high inputs of organic materials often used in organic farming.