Food security versus WTO membership in Taiwan

by

Prof. Dr. Beatrice Knerr, University of Kassel, Germany

e-mail: b.knerr@t-online.de

Abstract
For political reasons, food self-sufficiency still plays a central role in Taiwan’s agricultural policy. With production costs being high as compared to world market prices, protection by tariffs and subsidies were used to try keeping up domestic food production at a desired level. Yet, since Taiwan became a member of the WTO, such forms of shelter are no longer feasible. In order to increase domestic food production by enhancing productivity and making use of economies of scale, significant changes in the country’s farm structure will be necessary.

Three major interdependent structural obstacles stand in the way of efforts to modernize Taiwan’s agriculture and achieve a higher and more competitive food production: the small size of the farm plots, the ageing of Taiwan’s farming population, and the high proportion of farm-family income derived from non-agricultural sources.

In spite of high and increasing urbanization, an unfavourable farm structure persists, with farms holding on average less than 1 ha, and farmers’ average age being almost 60 years. In addition, “land to the tiller” regulations imbedded in the Land Reform Act, land speculation around big cities and an attitude which considers the selling of a piece of land which has been in family property for decades an dishonest act prevent land mobility. Programmes to support small farms might in the short run keep small farms alive by off-farm income but might in the long run be counter-productive.

The paper will explain the current situation, with a focus on the conditions which inhibit land mobility, and present possible solutions to increase land mobility and to create larger farms, resp. production units. By doing this, it considers experiences made with land mobility programmes in the EU, and in particular in Germany, which in former times experienced many of the structural problems now being encountered in Taiwan.
1. Introduction

Food security has plaid a central role in Taiwan’s agricultural policy since the country has established itself as an independent state. The more production costs for farm products were increasing in the course of the countries industrializations, the more domestic food production has been supported by tariffs, import bans and subsidies in order to remain competitive as compared to world market prices. Since Taiwan’s accession to the WTO in 2002, however, such forms of shelter have been severely restricted, and the country has to open its borders to cheap imports. Under these conditions, keeping up domestic food production requires enhanced factor productivity, and this will not be possible without significant changes in the country’s farm structure.

Three major interdependent structural obstacles obstruct efforts to achieve higher and more competitive food production: the small size of the farm plots, the old age of Taiwan’s farming population, and the high proportion of farm-family income derived from non-agricultural sources. In spite of high and increasing urbanization, an unfavourable farm structure persists, with farms holding on average less than one ha. “Land to the tiller” regulations imbedded in the Land Reform Act of 1949, land speculation around big cities and an attitude which considers the selling of a piece of land which has been in family property for decades an dishonest act, prevent land mobility. Land immobility and immobility of farm labour force are closely interrelated and result in over-ageing of Taiwan’s agricultural labour force, with farmers’ average age being almost 60 years. Programmes to support small farms might in the short run keep small farms alive by off-farm income but might in the long run be counter-productive.

This study approaches the question how Taiwan’s accession to the WTO, and the measures taken by the government in reaction to that have affected or might affect the country’s food security. The focus is on the conditions which inhibit land mobility, and presents solution models to increase it and to create larger farms production units by considering experiences made with EU-imbedded factor mobility programmes in Germany, which formerly experienced many of the structural problems now being encountered in Taiwan.

The next section (2) will explain different concepts of food-security and their implications for attaining it. Section (3) describes the changing rules of international trade introduced into Taiwan by the country’s WTO accession, Section (4) its implications for the agricultural sector, and Section (5) the government’s policy reactions. Section (6) summarizes the implications for food security in a “mid-term
review”. Section (7) presents adaptations of Germany’s agricultural policy to the WTO regulations and free market requirements und the country’s given structural background in the farm sector, and approaches the question what Taiwan might learn from that. Section (8) summarizes the conclusions.

2 Food security

All over the world, food security can be found as a central political goal expressed in constitutions and political programmes. The reasons for formulating this goal are similar world-wide. Yet, there are different concepts underlying it, and consequently different strategies to pursue it.

2.1 Definitions and concepts of food security

Food security is defined as a situation in which all persons at any time have physical, social and economic access to sufficient, safe and high-nutrient food which covers their food requirements allows them to live and active an healthy life (FAO, State of Food Insecurity 2000). There are five concepts of food security, each one with its own proponents and opponents: First, the most obvious: Supplying the food for the country’s population by own production within the national borders (strategy I). Yet, only certain food categories as a rule are categorized as essential for the population’s survival, not the whole spectrum of imports which might be very diversified would be categorized as having a meaning for food security (strategy II). Taiwan’s most basic staple food is rice. Considering only the consumption aspect is not sufficient for food security policies under the conditions of modern high external-input input farming, however. Given high input intensity which means food security in a strict sense could only be attained if there is also no risky dependency on imported inputs. Here, mineral oil plays a central role. This makes food security in a strict sense a goal which hardly can be reached, also for Taiwan as usually essential inputs have to be imported. (strategy III)

1 International organizations dealing with Developing Aid e.g. define food security as follows:
- "All people at all times have both physical and economic access to the basic food they need." (FAO Committee on World Food Security)
- "Access by all people at all times to enough food for an active, healthy life." (World Bank)
- "Access by all people at all times to sufficient food and nutrition for a healthy and productive life." (The Agricultural Trade Development and Assistance Act of 1990 {Public .Law .480})
- "When all people at all times have access to sufficient food to meet their dietary needs for a productive and healthy life." (USAID Bureau for Africa, 1986)
In practice, softer concepts are adhered to, which do not stress production of basic food at all times within the national borders. So, a variety is to consider food security as given if the countries productive resources are kept flexible enough to switch to the production of basic food for the population if necessary (strategy IV).

Another concept – mostly put forward by economists – is the idea that food security is attained when a country is sure to always have sufficient foreign exchange available to buy the food the population needs on the world market, maybe supported by stocks to overcome temporary crisis (strategy V). Following this strategy allows to organize agricultural policies along the lines of its comparative advantages. For Taiwan, whose export revenues are permanently above its import expenditures, this would be a feasible option (see Fig. 1) Nevertheless, strategy V might not be the best strategy from a political point of view.

Fig. 1: Development of export revenues and import expenditures in Taiwan

Calculated with data from COA (2006)

A concept which gains more and more importance is that of the appropriate stock strategy, i.e. food security is said to be attained if there is sufficient food on store to feed the population for a prefixed period, as a rule several months.

2.2 Reasons for food self-sufficiency

The reasons why a country wants to be self-sufficient in food production could be political, economic or social. In many cases all three aspects play a role. In the area of political reasons, being independent from the supply by other countries, which makes the own population vulnerable and prone to pressure, and fear of wars play the central role. This is also central for Taiwan’s policy. The country can easily be
blockaded and cut off from food imports. Due to its precarious relationship with Mainland China, this aspect seems to be vital for the country’s future. Yet, there are also economic reasons speaking in favour of at least a certain degree of food self-sufficiency. Here, fluctuating world market prices - of imported food products as well as those of the export products which pay for the food imports - play a role which is especially important for countries with low potential to earn foreign exchange. In this context also social aspects play a role: increasing food prices particularly hit the economically vulnerable.

The WTO accession is expected to bring advantages by increased possibilities of specialization in areas where the country has comparative advantages. Deciding for self-sufficiency, however, means loss of specialization of production. Each of the categories and strategies explained above has its own specific drawbacks in this respect.

3 Taiwan’s agricultural sector in the context of food security

Achieving food self-sufficiency is of central importance to Taiwan’s politics. Any analysis of this and of Taiwan’s agricultural policy in general must be conducted against the backdrop of the country’s political and social concerns. In the foreground is this context is the persistent threat posed by the neighbouring ML China which considers Taiwan as a part of its national territory. With only few and relative powerless countries worldwide granting it formal diplomatic recognition, Taiwan has been concerned about the political and economic effects of a blockade which might be imposed by ML China, especially the implied threat to its basic food supply. Fear of such actions is one reason why Taiwan strives to be self-sufficient in the provision of food staples. (Knerr and Wang 2001)

In addition, attaining food self-sufficiency has priority because agricultural, and in particular staple food imports permanently require large expenditures of foreign exchange which since the 1980ies have permanently increased in spite of import restrictions.

Before the WTO accession, Taiwan strongly protected its agricultural sector by tariffs and subsidies. Agricultural subsidies which included guaranteed price for rice and other grains, contract production with guaranteed price for sugar, tobacco and wheat, subsidies to farmers shifting rice to other crops, deficiency payment for summer
vegetables and some input subsidies (COA 2005). The total AMS\textsuperscript{2} was an estimated NT$ 17.7 billion p.a. This policy contributed to the immobility of the sector’s factors of production.

In spite of the importance of food self-sufficiency, policy measures have not consequently promoted the achievement of that goal, yet. In fact, Taiwan’s position in agricultural trade has moved from a surplus in the 1980ies to a pronounced deficit, with staple food being the major import category.

Taiwan’s economic development since the middle of the 20th century has been characterized by rapid industrialization accompanied by declining importance of the agricultural sector, as measured by its share in GDP, export earnings and employment of labour force. Already before the WTO accession, the agricultural sector was under strong pressure and heavily dependent on direct and indirect government subsidies. The country’s agricultural exports were only marginal as compared to its imports.

The share of agriculture in the country’s GDP dropped from 30% in the early 1960ies, when it was as high as that of the industrial sector, to 2% in 2001 (COA). While in other countries such a development usually is accompanied by increasing farm size and decreasing number of farms, in Taiwan the contrary happened. Between 1952 and 2000, the average farm size dropped from 1.3 ha to 1.1 ha. Small farm size is at the root of a large part of the farms sector’s problems. It makes production and marketing expensive, contributes to part-time farming and to old-age structure of the farmers.

Rice is the major crop in terms of occupied area and employed labour force. Half of Taiwan’s farmers grow rice. Yet, its production has been declining already for a long time before WTO accession, and its share in value added by crop production decreased from almost 60% in 1952 to less than 20% in 2001. At the same time, that of fruit increased from 3.5% to almost 30%, and that of vegetables from 4.8 to 24%. There was significantly more to earn with fruit in many regions of the country, like e.g., Cholan Province (Chung 2006).

\textsuperscript{2} “Aggregate Measure of Support”
Taiwan’s agricultural labour force is characterized by old age, a low educational level and immobility (Wang 1998). The average age of those working in the farm sector increased from 33 years in 1965 to almost 50 in 2000, while the share of those who are older than 65 increased from 1.2 to almost 8% (COA). Only few young people are prepared to stay on the farms, as there is much more to earn in the industrial sector and in urban centres. The old age of farmers results in a less dynamic innovative and commercially enterprise spirit. At the same time, this situation contributes land immobility. With few or no income alternatives older framers must continue to work their land to survive (Liu 1991). Also, the tradition of keeping farm ownership within the family, combined with the unwillingness of younger people to work on their parent’s farm plays a role. This creates a vicious cycle of small and inefficient farms and unwillingness of young people to become farmers. Moreover many cling to their land, even if they do not farm it, as they hope to reap a speculative windfall later on. (Knerr and Wang 2001 and 2002)

The value of Taiwan’s agricultural exports has declined from US$ 4,152 million in 1991 to US$ 3,279 million in 2000. The major earners of foreign exchange were hides and skins, followed by feathers, wool, vegetables fruit and cereals. Cereals, feathers and wool display a stable export value, while the export value of vegetables declined by more than half as compared to 1991. Flowers show the most dynamic growth trend, from US$ 14 million in 1991 to US$ 46 million in 2000. By far the most import export country is Japan. Compared to it, other countries play an only marginal role. The value of agricultural imports is manifold that of exports. It increased from almost seven billion US$ in 1991 to 7.6 billion in 2000. The most important category are cereals with in import value of almost one billion US$, followed by hides and skins, oil seeds, fruits, roots and tubers and vegetables which are displaying the highest growth rate, and more than doubled over the previous decade (COA). The largest share of the imports came from Thailand, Indonesia and Malaysia, smaller shares from the United States and Australia.

4 Implications of WTO accession for Taiwan’s agricultural development

Since Taiwan’s access to the WTO the competitive pressure on the agricultural sector has increased as import restrictions had to be lowered and domestic subsidies to the farm sector had to be reduced. This caused a decline in exports, production value and prices. Policy reacted by various programmes and measures,
4 WTO regulations

Import restrictions for most agricultural products already had been relieved before 2002. Yet, those which had been added to that list with the WTO accession are those which are essential for daily consumption, in particular rice, chicken meat and peanuts. Therefore, the impact of these new regulations on the development of the food sector is considerable.

The average nominal duty rate for agricultural products was reduced from 20% to 15.2% (GIO 2005). It will drop to an average of 13% when the scheduled tariff concessions covering 1,021 agricultural items will have phased out. Of the 41 agricultural products which were under import restrictions before the WTO accession, 18 became free with the WTO accession. For 22 products, Taiwan is allowed to take safeguard measures if the problems for the domestic farm sector become too heavy. Hence they came under a tariff-rate quota regime; with tariffs remaining low up to a certain quota level, beyond which they increase strongly. Particularly sensitive products received an exemption period of two years and will be reduced afterwards. But these are exemptions and they cannot be expected to last for long. Over time, all tariffs will have to be reduced step by step.

Special regulations within the WTO framework apply for rice, Taiwan’s most important agricultural product, and essential for the country’s food security: its import quantity is restricted to 144,720 tons p.a. This amount is subdivided into a government part (65%), and a private part (35%). The government part is not allowed to be exported for food aid or to be used for animal feed. For sales on the domestic market, a price ceiling of NT$ 23.26 per kg of rice and of NT$ 25.59 for rice products was fixed. If the selling is slow, this mark-up may be cut by NT$ 3 every week until all the imported rice is sold.

4.2 Consequences for agriculture

As calculated by USDA, Taiwan’s GDP will grow by 2% p.a. (corresponding to more than 4 billion US$) due to the country’s WTO accession (USDA 1997). Yet, the domestic agricultural sector has to face negative consequences. According to estimates by COA, within the first few years after Taiwan’s WTO accession, the value of Taiwan’s agricultural production would drop by 6.8% or 24.7 billion NT$, while farmed land will decline by 53,000 ha.(COA)

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3 E.g. pork bellies, chicken meat, animal offal, and some fishery products (GIO 2005)
4 This had also been the case for South Korea and Japan.
5 Under the rules of Annex V of the Uruguay Round Agreement
6 This corresponds to 8% of the average consumption between 1990 and 1992.
Differences in factor endowment, i.e. in productive resources which are available for the fabrication of goods, determine on which products a country specializes after trade barriers have been removed. Specialization allows countries involved in trade to produce more efficiently and to use the proceeds from its exports to buy the good in the production of which other countries have a comparative advantage. By this, in theory, all countries profit from free international trade.

Taiwan is comparatively poorly endowed with arable land relative to labour (Fig. 2), in opposite to U.S., Canada and Australia, who have abundant arable land, and hence, are major exporters of agricultural products on the global level. Consequently, Taiwan is a net importer of food. With trade liberalization under the WTO Agreement, the country is expected to increase its grain imports over time (USDA, Economic Research Service (1997)).

**Fig. 2: Land/labour ratio and agricultural trade in Taiwan and selected major trade partners of Taiwan**

Domestic subsidies to the agricultural sector had to be cut by 20%, which is equivalent to NT$ 3.5 billion by 2002. In order to lower the AMS, the production of the goods that are under guarantee price system have to be reduced.

**Impact on imports**
Due to tariff reductions, the import of agricultural products increased. The country’s imports of grain would increase by almost US$ 100 million p.a. and its net food
imports by more than 0.6 billion\textsuperscript{7}, i.e. increases in imports would more than offset the growth of more than US$ one billion of exports (USDA 1997). Products which have to be sold fresh – like milk or pig intestines – naturally are less affected by imports. In addition there are some specialities like the meat of black pigs which might even be exported after Taiwan’s WTO accession.

Free trade in life animals and animal products has increased the danger of diseases spreading to Taiwan which poses a threat to domestic meat production.

**Domestic production**

Taiwan’s farmers would react by reducing the production of land-intensive crops like grains, while expanding their output of high-value products like meat, fruit, and vegetable. (USDA 1997) Rice has occupied the largest area and absorbed the largest number of labour force. However, domestic rice production is not competitive on the international level. Therefore, the impact of the WTO accession on the country’s farming population is considerable, although in a first step mitigated by special regulations.

According to COA estimates, the value of agricultural production in Taiwan will drop by 6.8% or 24.7 billion NT$ over the first year after Taiwan’s WTO accession, while at the same time farm land will drop by 53,000 ha (Oscar Chang 2006).

In addition to the tariff effect, competition by imports increased due to the establishment of new import distribution channels which made the distribution of imports more efficient. This concerned in particular imports from ML China. (CIO 2005)

The import of 144,720 tons of brown rice as fixed in the WTO Agreement means that the acreage of rice in the country will fall by around 30,000 ha. Together with the old stock that is now banned from export (the average annual amount over the three years before the WTO accession was around 100,000 tons) it amounts to 50,000 ha. The government plans to use the free land either for green manure, or transferred to non-agricultural purposes.

A similar development occurs for peanuts and adzuki beans which are also important for food supply in Taiwan. Here, ML China has significantly lower production costs, and will be very competitive regarding the import quotas which Taiwan has agreed upon. As estimated by COA, 4% reduction in the area planted with peanuts has occurred in the first year after Taiwan’s WTO accession, an by 8% up to 2004, and a reduction of production value by 17%. Regarding adzuki beans, even high tariffs are

\textsuperscript{7} Mainly the U.S. would export more food to Taiwan, USDA predicted that due to the WTO Agreement this would be an additional US$ one billion p.a.
not sufficient to keep domestic production competitive against imports from China, and therefore, the planted area is decreased by an estimated 15% within the first year and by 24% up to 2004; prices declined by 11% and 19% respectively (COA 2005).

Also, vegetables and fruit are under strong pressure. For example, the production of dried day lily dropped by an estimated 35% (COA 2005).

Livestock production in Taiwan is more expensive than in many exporting countries, e.g. the U.S., Canada and Thailand. In addition, the Taiwanese population has a preference for animal products which are comparatively cheap in foreign countries, like chicken wings (COA 2005): as a consequence of WTO, an estimated 10,000 tons of chicken legs p.a. will be imported, replacing a domestic production value of NT$ 1.2 billion. Therefore, the domestic chicken sector can hardly be expected to survive. Also, the pig industry has been reduced as a result of the WTO Agreement by one million head, from 7 to 6 million, and the yearly production value of milk has decreased by an estimated NT$ 1.5 billion. For peanuts and adzuki-beans the main challenge will come from mainland China where production costs are significantly lower than in Taiwan. COA estimates that the area planted with adzuki-beans declined by 14% in 2003 and by another 10% in 2004 (Chung 2003:3).

**Prices**

As a result of import liberalizations, the prices of agricultural products will drop, while imports will increase. It will be difficult for domestic producers to compete in the face of the country’s high land and labour costs. A large part of the problems are due to the country’ small farm structure which prevents cost-reducing economies of scale. This makes it increasingly difficult for Taiwan’s farmer to compete with the cheap mass production of the U.S., Canada or Australia which is flooding the world markets. Many experts point out that the price for Taiwanese rice is three times higher than on the world market. One year after Taiwan’s entry into the WTO, prices of rice, fruits, and chicken had dropped markedly. Already in 2002, the total production value of Taiwan’s farming, animal husbandry and fishery sectors declined by 0.63% as compared to 2001, crop production alone by 5.54% (CIO 2005)

**Impact on exports**

USDA estimates that in Taiwan, non-grain crops would account for 60% of the increase in agricultural exports, and processed food for an additional 30% (USDA 1997). Total food export value would increase by more than US$ one billion, but more than half of that would consist of processed food.
A wide-spread fear in Taiwan is that of competition by Mainland China. Because of similar production structures and – what for some appears to be worse – ML China’s attraction for new technologies from Taiwan and elsewhere the outlook is pessimistic, once ML China will have absorbed these technologies. “Once Mainland China will export the same agricultural products as Taiwan, Taiwan might have to withdraw from this market. As a consequence, Taiwan will permanently have to invent something new, in order to stay competitive. A hard task.” Says Roger Woo from the National Taiwan University” (cit. in Chung 2003)

More than half of this export expansion would be processed food (USDA 1997). This would be a result of a restructuring of the agricultural sector away from the production of land-intensive crops like feed grains (dropping by 60%) and towards high-value crops and processed food.

**Implications for factor mobility**

Yet, when considering the long-term adaptations of Taiwan’s agricultural sector to the WTO accession, it has to be observed that the labour force of Taiwan’s farm sector is not mobile due to its low educational level and old age. This has been taken care of in the study by Chiang, Sun and Lin (2004). By using a multi-sector computable general equilibrium model\(^8\), they predict the changes which may occur in Taiwan’s agricultural sector after the country’s accession to the WTO. In general, they expect that agricultural imports will grow in the near future, while domestic production will face enormous challenges, because most of the country’s agricultural products are not competitive.

Due to the fact that agriculture in Taiwan produces labour-intense (with e.g. 35% of the total cost of paddy production and 53% of those of fruit), and the sector’s labour force is elder and almost 98% are unskilled (as compared to 52% in the rest of the economy) they predict that a large number of older, unskilled workers will become unemployed.

They arrive at the result that most of Taiwan’s agriculture would be negatively affected by the reduction in tariffs. The impact on the domestic production of rice would be confined to 5.1%, because the effective system of restricting imports through tariffs and quotas will remain. Sugarcane production will be hurt most, by a 88% decline in output and 22% decline in price. Special crops are expected to decline by 34% and fruits by 26%. These declines would be less if the agricultural factors of production would be more mobile.

\(^8\) Specifically, they used the ORANI model.
5 Policy responses

Given these conditions and expectations, the Taiwanese government saw itself faced with the challenge to take political action in order to defend the societal goals, and consequently undertakes strong efforts to protect farmers from the “WTO shock”, like measures to raise agricultural competitiveness; to encourage farmers to open up sources of non-agricultural income; to give up raising livestock; and to train them for alternative jobs. For that purpose, the government also established a Task Force to cope with the negative effects which the WTO had on the farmers. (COA 2005)

Market stabilization

In order to stabilize agricultural markets, the government has undertaken short-term prize stabilization measures for 18 groups of sensitive farm and livestock products, as well as fishery products, that would be affected by the country’s WTO accession. They include marketing promotion, low-interest loans, and assistance in finding alternative livelihoods for those wishing to leave these industries (GIO 2005). In mid-2002, the government established an Agricultural Products Import Damage Relief Fund of US$ 860 million in favour of agricultural products hurt or expected to be hurt by imports (GIO 2005). Budgets are planned to be allocated to this fund according to the perceived needs. In addition, the government buys certain products in order to keep their price stable.

Production and marketing of high-value products

The government strategy considers the promotion of high-quality high-valued products, namely fruit and vegetables, and also eco-products as the most promising strategy to keep the country’s agricultural sector alive (Chung 2003). In this context, policy makers point to the high quality of Taiwan’s pig meat which is highly demanded on the domestic as well as the export market, and, therefore, can be sold at stable and high prices. A focus is also put on flower production.

Export potential is seen for high-quality products and for products which can be planted and harvested mechanically.

The government promoted the foundation of TASC (Taiwan Agricultural Strategy Coalition), a private organization intending to make the marketing network for fruit and vegetables more efficient. To encourage the cooperative marketing of products from the same region, TASC tries to join different farmers associations under the
same label and to create common images. Under the pressure of market liberalization farmers’ associations are urged to work together to survive. Entrepreneurs like exporters and food processors have joined that initiative. As an example of success, Chung cites the mango market in Tainan Province where the cooperation of farmers’ associations succeeded in increasing the domestic market price by 18.5% and the export price by 18.5% (Chung 2003).

E-commerce of agricultural products is promoted.

**Processing**
Including additional functions (processing) means a price mark-up and the possibility to enlarge the market as processed agricultural products can be transported over much larger distances. This is seen as a chance for farmers to economically survive and it is supported by the government. It often implies a shift of productive agricultural resources from the production of basic food to semi-luxury products like wine (Chung 2003). Processing, in addition, enlarges the market as they can be transported to larger distances.

**Promoting new technologies**
For increasing the productivity of farms resources and getting an edge in the export sector, the government puts strong emphasis on developing new technologies. In order to put a barrier on competition from outside, Taiwan has released strong regulations against the export of agricultural innovations, research results and patents. The government puts emphasis on a knowledge-based restructuring of the country’s agricultural sector.

**Farm-based tourism**
Over the last decade more and more farmers transferred their farmland into tourist farms and orchards. They attract people from cities who want to enjoy rural life, beautiful landscapes and fresh air, mostly on weekends. This has been strongly supported by government programmes. So, the number of leisure farms in the country increased from 12 in 1974 to 1,102 in 2004 (COA). Many of them, and in particular those which belong to small farms, are not profitable, yet (Li 2006). Therefore, they might lead to an unrewarding loss of productive resources of the farms.

**Health protection for plants and animals**
Particular care will be taken against the inflow of diseases. In this context, foot and mouth disease poses a particular threat. Here, animal smuggling across the Taiwan straight from ML China is particularly watched.

In order to counter the increased danger of epidemic diseases and pests, the government strengthened quarantine inspection measures on imports and domestic animal and plant products. It also promoted research in that area.

To promote exports, the government also stepped up export quarantine inspection facilities, as well as technical and information exchanges (CIO 2005).

**Trying to escape the WTO rules by multifunctionality**

Multifunctionality of agriculture is a concept which had been brought into the WTO negotiations by Taiwan and some other countries⁹ as an argument for further extending subsidies to the agricultural sector which otherwise could not be given. It refers to non-commercial objectives and expresses the “multiple roles assigned to agriculture. In this view, agriculture as an activity is entrusted with fulfilling certain functions in society. Consequently, multifunctionality is not merely a characteristic of the production process; it is a value in itself…” (OECD 2001:14, cit from Li 2006). The concept of multifunctionality includes, besides food security, environment, cultural heritage and rural development. It is, as a reason for subsidies, highly disputed within the WTO. Those against applying it oppose policy implementations that may obstruct agricultural liberalization.

Multifunctionality has also been used as a concept which puts the survival of smallholders in the foreground, and for that purpose supply arguments for extending subsidies to smallholders. This might contribute to keeping resources in inefficient forms of farming or shift the to non-farm use, thus bearing a negative effect on food production.

Supporting non-farming functions of farm resources, like, e.g. farm-tourism, in addition holds the risk that the non-farm activities become more important over time than farming.

The argument of multifunctionality can also be explained to the domestic population which might than accept more subsidies to the farm sector.

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⁹ Switzerland, Norway, Japan and South Korea

6 Perspectives for food security in Taiwan – a mid-term review
Problems in the agricultural sector, and namely for food security, have aggravated with Taiwan’s accession to the WTO. Although it is too early to draw final conclusions, as the WTO accession was only in 2002, certain consequences appear increasingly clear.

Due to strong and tightening land scarcity in Taiwan, the costs of self-sufficiency have increased. This is also due to costs of labour force although this might – with suitable farm size – be to a significant extent substituted by capital, i.e. mainly machinery.

There are large differences between what could be gained by producing rice (calculated as the world market or local price of rice times the land productivity) and the productivity of land if an industrial plant is built there (this might be measured by free market prices of land). The difference might be even larger when comparing land prices with the profit which remains after deducting the production costs (net production value of rice). This difference would have to be subsidized by the government, if rice production should be maintained (provided the farmers consider only economic aspects when keeping their land under rice production); it constitutes the costs of attaining self-sufficiency under category II.

The country’s factor endowment cannot be changed in the short term, and the policies chosen are not conducive to a most efficient allocation of the sectors productive resources. In the long term, however, the country has to adapt to its comparative advantages and increase factor productivities if it intends to pursue the goal of food security without paying high subsidies or incur the disadvantages of protection.

Yet, social and societal problems in the agricultural sector seem to be in the forefront of politics, and when they are in conflict with the target of food security, they appear to have priority for policy makers.

Under the given conditions rice production will continue to decline, as it has done since the 1960ies. The same might apply to fruit and vegetables, although the government strongly promotes their production. Land is moved out of the production of basic food. Shifting resources into the production of semi-luxury and processed agricultural goods implies a loss of food self-sufficiency, although it might constitute a gain in commercial value and foreign exchange.

The question arises which concept of food security the country intends to follow. If self-sufficiency has a meaning, policies would have to be modified. Improving it by adhering to protectionism would retard growth in the modern sector and have negative redistributing consequences (Duncan, Rees and Tyres (2003). Improving it by susidies would burden the public budget. Productivity increases, in particular in
rice production, would bring the country in a better position to cope with WTO rules, saving high subsidies and avoiding losses of specialisation.

The major structural barriers against a more efficient factor allocation seem to be the small size of land holdings and the farmer’s old age structure. Germany faced similar problems; therefore, it might be useful to study the measures taken there to resolve them.

7 Agricultural trade liberalization and structural change in Germany’s farm sector

Germany as well as the European Union as a whole have formulated of food self-sufficiency as a major goal of agricultural policy. For Germany this was a consequence of a food crisis with thousands of people starving as a result of a blockade against food imports imposed on the country at the end of World War II. Yet, the concept of food security as formulated in Germany’s agricultural law, and as formulated on the EU level differ from each other: while in Germany, food security has been meant to be achieved by government support and direct and indirect subsidies to the frame sector (explicitly tax policy, social policy an price policy), on the EU level the focus is on increasing efficiency of production, which should partly be achieved by the enlargement of farms.

Although, without protection, Germany’s farm sector might not have been competitive on the world market, food security has largely been achieved as food self-sufficiency, with the help of protection and subsidies.

When agriculture was integrated in the WTO (former GATT) Agreement, Germany’s agricultural sector which is inseparably connected to the EU had to face similar challenges as Taiwan today. However, it was better prepared by structural changes undergone before.

Such as Taiwan, Germany formerly had the problem of an over-aged farm labour force. To resolve it, the government in the 1950ies introduced a pension system which gave farmers basic material security when they gave up their farms (whereby it was expected that part of the money they need in their old age should be provided by those who will take over the farm, as a rule one of their children). Later on, this system was complemented by a programme which granted additional pension payments to those farmers who gave up their farms earlier than at the age of 65, which is the normal age of retiring. In addition, the farm had to be transferred to structural improvement, i.e. as a rule give up to a larger or more efficient farm. At the same time a programme was launched which supported young farmers who took
over a farm, by cheap credits and lump-sum start-off payments. Since the late 1990ies, Germany is among the EU-countries with the youngest farmers, This development might not have taken place if farms would not have enlarged. Although, until the 1990ies, Germany’s agricultural policy supported smaller and middle-sized farms, and allowed many of them to continue which, under free market conditions would have to be given up, farm-sizes grew steadily. This development was enhanced when, with Germany’s reunification, large farms in East Germany became part of the sector which caused a change in the paradigm. In 2004, the group of farms above the size of 75 ha are growing in number, while the group of those which are smaller is decreasing (BMVEL 2005). This “break-even point” has been constantly moving upwards since the middle of the last century.

Yet, for Germany, too, the requirements of free trade imposed by the WTO Agreement pose a challenge, as trade barriers have to be removed and subsidies cut down. When considering the policy reactions, the goal of food self-sufficiency as well as the social goal of protecting the farmers’ established livelihoods and protect them from an external shock has to be observed.

Subsidies had to be decoupled from the quantity of production, but still farmers receive compensating payments which are planned to decline over time. Together with increasing adaptations to the world market prices this will further promote the enlargement of farms.

What might be particularly interesting for Taiwan is the way, small farms with labour intensive production, like fruit and vegetables, are supported. They are allowed to seasonally employ cheap foreign labour force under a special programme. The migrant workers are allowed to stay in Germany for several months and after that have to leave the country. In this context it is important to note that Germany has severe restrictions against labour force from non-EU countries seeking employment.

For many, most probably the overwhelming share, of these farms, this is the only way to economically survive (Knerr 2001). Between 1994 and 2003, the number of seasonal workers has increased from 133 684 to 308 992 (Fig. 2). Most of them come from the neighbouring Poland. They work mainly in the fruit and vegetable sector, and a few also in the production of hogs.
Fig. 2: Placing of expatriate seasonal workers in Germany, 1994 to 2003

As shown in Fig. 3, the number of foreign labour force working in Germany’s agricultural sector increased at the same path as the number of Germany labour force decreased.
This strategy is pursued by a number of other EU countries like Spain or Greece who with the help of cheap foreign labour force keep the farms with small land size alive (Knerr 2006).

In Germany, land mobility is decisively enhanced by land renting. This is most often the first step of giving up the family farm when social or emotional barriers against selling the land are too high. In Germany, 63% of the land which is farmed is under renting (BMVEL 2005)

Are there lessons to learn from these policies for Taiwan?
For producing staple food, namely rice, more efficiently, farms in Taiwan would have to be larger in order to decrease per unit production costs and make use of economies of scale. Even if still they would have production costs which are not competitive on the world market, it would reduce subsidies given by the government in order to keep up production.

In order to improve the farmers’ age structure, financial incentives for elder to give up their farms and for younger ones to take it over appear necessary. For elder this would essentially mean a pension system, where pension payments would be tied to transferring the lland to someone else, be it by rent or sale. Concepts for that have been developed since the mid-1990ies, like awarding special pension benefits for land divesture (Wang 1998), but they were not consequently pursued. However,
given the large number of elder farmers who did not pay into such a system, and their low level of income the government payments would have to be substantial. Land rental would be an important step to raise the mobility of land. However, farmers have strong caveats against that, especially regarding leasing periods for longer than nine years (Chen 1993). This attitude comes from a provision of the first land reform, saying that land that had not been cultivated by its owner for more than nine years could be subject to expropriation (Knerr and Wang 2001). It seems to make sense to remove this law.

A most sensitive issue for Taiwan would be the question to employ foreign labour force on a timely restricted basis. Although, there might be strong opposition against such strategies, it would be worthwhile for the government to carefully study models applied in other countries in the world, where such programmes have been practiced for decades, often within the framework of bilateral government agreements.

8 Discussion and conclusions

There is hardly any doubt that Taiwan had to access WTO for economic and political reasons. It will have a positive impact on macro-economic growth and average per capita incomes. Yet, one of the prices to be paid for this is a loss in food security as defined by strategy II. The production of staple food will come under strong pressure, and their domestic production will decline significantly. The measure taken by the government will not help to counterbalance the pressure, but might in some respects contribute to make the situation worth by enhancing the shift of productive resources, land, labour and capital, out of staple food production. The policy concentrates on supporting smallholders and not on food self-sufficiency which de facto does not seem to have anymore political priority.

The way to support food self-sufficiency would be increasing productivity, and lowering of production costs for staple food. This would have to be achieved by enlarging the farms. Vegetable and fruit production could be supported by employing cheap contract labour force from abroad. This might, however, be a price which the Taiwanese government and population do not want to pay.

In addition, there remain basic conflicts of land use which has been sharpened by Taiwan's accession to the WTO: as land is very scarce there is a strong competition for it. Its economic value is higher if used for building a factory producing modern industrial products for export than if it produces food for the local population, food which could be imported at prices significantly below the domestic production costs. As by the WTO accession the relationship between the price for agricultural products
(disfavoured by the WTO) and those of industrial products (rather favoured by the WTO) has shifted in favour of the last, agriculture has increased difficulties to compete.

Maybe, Taiwan has to change its strategy of self-sufficiency, because attaining it by domestic production might be too expensive.

The Taiwanese see also a chance in the large world market to which they might export their agricultural product. Here, in particular high-valued fruit, vegetables and also pig meat are considered as promising, and optimists see a chance on the huge market of ML China. However, this would transfer productive resources from the production of basic food products, in particular rice, to non-essentials.

In order to improve the production conditions, Taiwan’s agricultural sector has to accomplish a structural adjustment, in particular with regard to farm size. This is not only important for food security, but to render the farm sector in general more professional.

Agricultural policy has at the same time to take care of the other goals which the sector has been assigned by society to keep in focus: farmers’ welfare and livelihood and ecological sustainability, i.e. production has to be ecologically sustainable. In order to take care of the last aspect, it might be oriented towards principles as the EU’s cross-compliance, i.e. those who receive support by the government have to adhere to certain environmental standards. Here, measures of control would have to be established. In addition, the population must be convinced to support these measures, i.e. it has to be made clear that the whole population profits from positive external effects conveyed by agriculture.

New requirements to open Taiwan’s agricultural markets came up in 2005. Therefore, measures resolve the problems are urgently to be taken.

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