

# Food Security in Taiwan: Current Status and Strategies

Yang, Min-Hsien<sup>1</sup>  
Feng Chia University, Taiwan

## INTRODUCTION

The global extreme weather influences some major food production regions while many emerging countries speed up economic development and consume more and more food. More than that, the unstable oil prices push the markets of developing biomass energy and use up more food supply capacity. Therefore, there are more and more risks in the recent global food supply, which already raised a lot of attention from the governments around the world. The sufficient food supply and stable price remains an issue of security of the societies by keeping away from fear particularly in the concurrent imbalance of economic situations. The agricultural sector is not only a major cornerstone for national development in terms of GDP contributions but also a good protection for eco-environment and food sufficiency. The stable and security food supply from agricultural production is necessary for the stability of a nation.

### Current food status

According to the food balance sheet, there are 11 food categories, including crop, potato, sugar, honey, seed and oil seed, vegetable, fruit, meat, egg, aquatic, milk, and oil. Among the above, only aquatic products are produced in excess in the domestic market, while others require imports to supply domestic demand. In 2014, the highest to lowest level ratios of import over demand volume are: seed and oil seed (100.9%), sugar and honey (89.6%), crop (86.1%), potato (77.1%), oil (49%), milk (29.4%), fruit (16.2%), meat (14.2%), vegetable (11.6%), egg (-0.1%), aquatic products (-71.7%). Thus, it is obvious that the domestic food demand in Taiwan is highly dependent on the import sector. Meanwhile, there are almost no production of individual products such as wheat, soybean, Chinese sorghum, Manioc, and sesame, in Taiwan. There is high level of import dependencies on crops such as corn (103.9%), sugar (93.6%), beef (93.1%), and lamb (91.4%). Although rice is self-sufficient, the required import quota is 144,720 metric tons because of WTO import requirement.

Based on the calculation of self-sufficiency by calorie, overall is only 34.1%, while the individual products from high self-sufficiency to lows are: aquatic products (172.4%), egg (99.8%), vegetables (91.2%), fruits (87.7%), meat (78.3%), milk (31.4%), crop (29.9%), potato (26.5%), sugar and honey (10.1%), seed and oil seed (4.0%).

Because of the import competitiveness by low pricing, heavy promotion, and/or trade quota, it has gradually changed the eating habits of people with more imported product as replacement of domestic products, which pundits say might cause the decline of food self-sufficiency in Taiwan. The government has been promoting import-substituted food production because of the recent climate change for the risk of food security problem since a sharp food price raise in 2007. Comparing to the historical lowest ratio in 2010 was 30.4%, the calorie-based food sufficiency rate has increased by 3.7%.

Unfortunately, some severe imbalance problems exist in the current structure of food production in Taiwan. There was an excess supply of rice production from 271,077 hectares

---

<sup>1</sup> Ph.D. in Agricultural Economics and Professor of Department of International Trade at Feng Chia University, Taiwan  
Email: yangmh@fcu.edu.tw

in 2014 because of the public grain purchase program. In contrast, corn, wheat, soybean, and sugar are highly dependent on imports. Meanwhile, there are as many as 98,378 hectares of fallow lands under the limited farming land size in Taiwan. In parallel with food production, the imbalance problem of domestic and import food also exists in consumption. For instance, the domestic consumption of domestic rice, fruit, and meat has been decreasing for the past 10 years, while consumption is increasing in imported wheat, fruit, and beef. Thus, the overall import dependency keeps rising but food self-sufficiency keeps on declining. The problem of trade deficit in the agricultural sector, therefore, becomes even more challenging.

Food security is composed of three elements of domestic production, inventory, and import. Although there are differences across countries by the local production conditions and risk attitudes, the three elements might be in different weights of importance, given the universal purpose of risk diverse and cost reduction. The current government policy aims at increasing the food self-sufficiency rate to 40%<sup>2</sup> by 2020. In addition, the food reserve safe volume<sup>3</sup> should be more than 3-month rice consumption according to the “Domestic Rice Safety Stock Level” regulation. Other than the above, there is no specific food safety volume as guidelines, and neither is there a plan of import food ratio. The food security plan by the government is incomplete.

### **Strategy to affirm food security in Taiwan**

The analyses follow regarding the food security strategy and its position from the perspective of Taiwan.

1. Position: Food security should be positioned as a national level of security, which is highly correlated with social and civil stability. It is also a basic human right to safeguard and make the citizens free from hunger, which is the government’s basic duty and cannot be determined fully by the market. Furthermore, it is naïve to disregard the importance of food self-sufficiency in a free-trade regime. All governments are believed to be carefully sensitive to the price stability of food supply. However, how to supply the food in a sufficient manner is the major challenge for many governments around the world. The food sufficient supply should consider the three aspects of domestic production, inventory, and import, and the mix of these three.
2. Assess: The food security matter should be implemented in a dynamic view, grand-view planning, and strategic thinking of structural relationships. First, dynamic implementation: to operate the inventory by using import-inventory relationship, and growth period and inventory relationship. Second, grand-view planning: to enlarge the food supply pool by the purchase condition of food import origins, international food support agreement, and international changing conditions. Third, to establish the 3-element structure among domestic production, inventory, and import via the supporting relationship between food crops and energy crops. For example, the dependency and conversion of an established “4Fs” (food, feed fiber, and fuel) should be managed and balanced and the supporting relationship among food, feed, fiber (energy crop), and fuel (biomass energy). The price diffusion will cause some systematic problems of food security to be resolved by interdisciplinary rigor assessment. In addition, it is also necessary to assess the food production structure, farmland and fallow structure, and food consumption for structural

---

<sup>2</sup> Japan is similar with Taiwan. Although the increasing target of food sufficiency rate were not met, the Japanese government still wishes to increase the food self-sufficiency rate from 41% in 2008 to 50% in 2020.

<sup>3</sup> According to FAO (UN) suggestion, the standard of food security should not be less than 17% to 18%, which is equivalent to the 2-month consumption volume.

re-adjustment, in order to be responsible for food security.

3. Production: The food self-sufficiency rate should be emphasized to promote multiple food production in Taiwan and in parallel, to improve the food production structure. Because food belongs to the land-using category, it means to increase land-using rate for the intention of increasing food self-sufficiency rate. There are several options for the above intention. First, fallow lands should be re-activated and re-farming index should be increased<sup>4</sup>. Second, the import-substituted crops should be the priority for re-farming candidates, such as feed corn, wheat, feed grass, cassava and sugarcane. Third, the feasibility of farming biomass crops might be considered for supporting the future energy policy in order to reduce the dependence of import petro.
4. Inventory: The government public grain policy manages the rice inventory, but there is no information on rice and other food inventory in the private sector. There are two sources of public grain inventory: the government purchase and import by quota. The former is a price supporting function to support farmer's income and manage public grain sources. Even if the public grain policy ends in the future, the government will still purchase public grains at market price to secure food inventory. The latter is required by WTO to import 144,720 metric tons of brown rice per year, among which 65% is partial on public grain inventory. However, the government does not require the rice inventory report from the private sector, and neither is it required of the inventory information of imported wheat, corn, and soybean. Therefore, the government does not own the information of how much inventory can instantly supply the domestic market consumption for a food security index. Thus, the inventory information reported from the private sector must be further regulated. Because of the time lag between crop growth and harvest, food inventory supplies the ad hoc demand during the time lag. It is not necessary for inventory to supply a full year consumption level, but it should assess the current and upcoming releasable inventory as an expected dynamic inventory management during the crop growth period. The government should own a clear database of the current production size and growth period information.
5. Import: Adopting the general concept of food security based on WTO regulation is too narrow by the definition of food supply of the importing country in combination of market access (Stevens, Greenhill, Kennan, and Devereux, 2000), which implicitly raises the import food ratio in the food security calculation. However, the export regulation on the exporting country is not symmetric to the importing counter. Moreover, effective food security should be harmonized upon liberalization of international trade. Because the WTO Doha negotiation was pending, food security should not expect any possible change by WTO regulation. On the other hand, many regional RTAs emphasize on minimizing trade barriers and promoting trade. RTA might be an alternative to setup regulation of food emergency aids between countries in order to remain a stable environment of regional trade. For example, Taiwan already raised the attention at APEC to establish food emergency reserve.
6. Consumption: Food security should assess both supply and demand balance. If the consumption behavior can be educated and adapted (e.g., encourage domestic consumption, reduce import consumption, reduce meat consumption, and etc.), or be led to reduce food wastes and recycle (e.g., food waste recycle for pig feeding, waste vegetable as kitchen supply), it will reduce the tension of food supply shortage and further achieve the goal of food security.
7. Mechanism: First, the government should establish a "food security strategy committee"

---

<sup>4</sup> Re-farming index already dropped to 89.9 in 2014 from 100.3 in 2002.

to regularly publish alerts based on food security risks and take some signals (e.g. economic cycle) into responding considerations. Furthermore, by assessing the alert and risk, the classification of risk management mechanism should be setup<sup>5</sup> for the standard of dispatching food. Second, the “food security strategy committee” should regularly examine food production, consumption, inventory, and trade as well as evaluate food value at risk (VAR). VAR evaluation aims at the maximum expected loss to be calculated at the regular market situation under a certain significant level. Meanwhile, stress testing and scenario analysis should be conducted according to many variable situations in Taiwan such as climate change and the China relation.

## CONCLUSION

Global attention pertaining to oil and food crisis has confirmed the three transitional concepts of food security since UN called a food meeting in 1974: from global and national perspectives to family and personal perspectives, from primary food production perspectives to life perspectives, and from objective index to subjective perception perspectives. The meeting already covered, developed, increased and enriched the food security concept. If food security is a complex goal, covering purposes of protection, safety, health, and self-management, while the various and complicated life chances are faced by individual families, the government should equip a multiple, level-sensitive, and systematic method in formulating food security policy. Family and personal consumption preferences are fully satisfied in the post-modern regime. National food supply remains well by market mechanism in the emerging liberal regime. Maybe there are other options for different demand, supply capacity, and self-defined goal to be included in the future discussions of food security in its definition, content, and strategy.

Global warming caused by climate change, influences production zone, volume and quality, and made food security even more uncertain. However, we could also treat it in a positive way, such as the advantage of R&D in food varieties breeding. Other options might take advantages of agricultural facilities to reduce the potential climate change impact. To become technology intensive and capital intensive might be the future direction to take in order to upgrade Taiwanese agricultural global competitiveness.

Date submitted: July 18, 2016

Reviewed, edited and uploaded: July 19, 2016

---

<sup>5</sup> The three levels of food security in Japan are classified: 0- imbalance of domestic demand and supply; 1- some specific agri-product supply drop more than 20% from the normal level; 2- food supply drop below 2,000-Kcal per personal per day.