

South Korea's and Thailand's Food Security: A Case Study on Impacts of Climate Change and Free Trade Agreements

Wichian Intasi
Institute of East Asian Studies
Thammasat University

The Rationale of the Study

We are able to view food security as a situation that safe and nutritious food is available for people to meet physical need. The availability of food is also considered at the family, country, and global level. When people fail to secure food to meet their demands, that situation is likely called food insecurity. Natural disaster, for example torrential rain, flood, and drought or human behaviors, namely poverty, war, and government policy, are attributed to food insecurity. When people experience long hardship due to the unavailability of food, their health appeared prone to damage and easily infected with disease, which hinders them to engage in activities. Furthermore, if a large number of people are inflicted with difficult situations, for example social and political turmoil, food smuggling, demonstration, and riot, would occur. Countries with rich natural resources and good governments seemed to have few chances to face the food insecurity.

Generally, we can conclude that food security definitely depends on natural environment and human behaviors. Countries located in areas with long monsoon season, rich

with natural resources, and be suitable for plantation crops, have comparative advantage to be food producing countries compared those located in desert areas. With surplus of agricultural products in each year, some countries export those products and get foreign income for importing industrial goods. However, patterns of development having been implemented for several years ago lead to the natural and environmental degradation: the deforestation, the increasing number of land for large plantation, the industrial and urban sprawl, the construction of dam, and the increasing demand of water for households and industrial activities. This phenomenon has caused unbalanced development, which unintentionally poses negative impact on agricultural sector. Water and land for plantation has decreased. Air and water pollution emitted from factories and households have threatened the ecology system that eventually lessens the agricultural products and chain of food in the nature. In a large number of areas, there are reports suggest the spread of weeds, insects, rats, and birds that have damaged rice, vegetables, and fruits in the farmland. Fishes and birds, furthermore, have also been found dead due to the pesticide in which farmers use to control the spread of weeds and insects.

Since the late 2000s the industrialization and development that based on the input of huge natural resources and fossil-based energy have caused serious problems, especially global warming, to the human-beings and the environment. The emission of carbon dioxide has depleted the ozone leading to the temperature rising on the earth. A number of research findings suggested that such

phenomenon causes the climate change, which leads to the slow rising of water level in the ocean due to the ice melting at the North and South Pole, and also leads to the turbulent weather which severe flood or drought has occurred for a long period. Human beings, livestock, and plantation crops are unavoidable of the impact caused by the climate change. The study on the impact of climate change on crop yields in East Asia and the Pacific region by using the crop yields in 2000 as the base for forecasting the year 2050 suggested that the amount of rice production would decrease twenty percent, soybean thirteen, wheat sixteen, and corn four (Nelson et al., 2009). According to the report of Asian Development Bank (2009), Countries in Asia, namely Afghanistan, Bangladesh, Cambodia, India, Laos, Myanmar, and Nepal, would experience an extreme effect of the climate change.

Though Thailand has been excluded from a group of countries that would experience an extreme effect of the climate change, around forty percent of its population is farmers. If they are unable to plant their crops or crop yields are damaged because of the turbulent weather, food insecurity and unstable income definitely occur. Thai people who cultivate agricultural crops especially in out-of-irrigated areas are quite poor and have not-high standard of living. When rice is not enough for consumption and sale for income to purchase necessary goods for their living, there are quite limited alternatives for them like to be temporary migrant workers in urban areas. The migration from rural to urban areas, though, occurred in a short period because temporary migrants usually return to their hometown when

the rainy season starts, certain problems always emerge in both rural and urban areas. For example, their children have been left with senior family members, which sometimes fail to look after the children due to the old age. Owing to poor skills, they likely get a low wage and have not so good welfare from employers. All of these hinder the economic and social development as a whole.

Traced back to 1991-1993, Thailand had encountered long severe drought due to the short period of rainy season. Paddy field in the central region, the country's largest area of planting rice, around 4.5 *rais* (one rai is equal to 0.16 hectare.) was damaged because of the shortage of water. Reservoirs in the northern region that usually supply water for the paddy field in the central region failed to do their function since water was in the lowest level. It found that since 1988 the quantity of water flowing into the reservoirs has been continuously decreased (TDRI 1994). During 2004-2005 Thailand also had experienced the early ending of the rainy season that prompted the spread of severe drought in fifty-one provinces. Around nine million *rais* of paddy field and two million *rais* of vegetables and fruits were damaged (USDA 2004). At the beginning of 2010, Thailand was harder hit by drought than the previous years. As of last March the drought covered fifty-one provinces or around three quarter of its total areas. Water in large dams and reservoirs decreased more than fifty percent of their capability (Rujiwarangkul 2010). Furthermore, water level in the Mekong River that shares border between Thailand, Myanmar, Laos, and Cambodia had been the lowest level in the twenty years. Farmers who depend on water from the

international river for watering their plants, fishing, and using in households were in difficult situations (Agence France-Press 2010). Some officials and organizations that monitor the situation predicted that the quantity of rice that Thailand produces in the next growing season would lower than thirty million tons, which suggested the volume of rice that will be exported to foreign markets will decrease. Currently, Thailand shares around one third of the world's rice market (Suwannakij 2010). Besides rice, other crops, for example soybean, corn, tapioca, and fruits, their yields will also decrease.

In case of South Korea, around eighty percent of area is mountainous while the rest is arable land. South Korea, in addition, is an industrial society; only five percent of its population engages in agricultural sector. Therefore, the country has largely depended on importing food from foreign countries. Based on data in 2008, the value of South Korea's imports of agricultural products was 18.9 billion dollars, but the value of exports of the same kind of products was 2.3 billion dollars. The agricultural products that South Korea imported were corn, wheat, soybean, vegetable, fruit, vegetable oil, meat, pork, and milk products. The countries that South Korea imported these products were the United States, China, Australia, ASEAN, and the European Union (Economic Research Service, USDA 2010). Rice remains one of the staple foods in South Korea. The government has subsidized farmers due to the rising cost in growing rice. Furthermore, South Korean government has carried out policies to protect farmers by limiting the quota of rice import not over four percent of the total demand for consumption in

each year. The government also strictly allows rice import from specified countries. It found that the price of rice in South Korea was more expensive than foreign markets.

When compared with Thailand, South Korea rarely experienced severe drought, only flood sometimes caused damage to agriculture. However, the drainage system is able to lessen the damage. South Korea, therefore, is in better position than Thailand. As South Korea has quite heavily relied on food and agricultural imports to meet its people's demand, it is at risk if exporting countries are unable to supply food owing to the natural disaster, the skyrocketing price of goods, or even war. It possibly pushes South Korea to encounter food insecurity, which some agricultural products are not enough to meet the consumers' demand.

Besides climate change, free trade agreement (FTA) in some aspects has affected food security. We have seen good side of free trade agreement that contributes the flow of goods and services between countries with low or zero tariffs. Consumers have more various kinds of products to purchase, which some of them maybe cheap and good quality. However, import products are able to pose negative effects on domestic ones, if the import products are cheaper and have better quality than the domestic. The domestic products will lose their share of sale in the markets if their prices are unable to scale down, they will lose capability to compete with the import. In Thailand, when the free trade agreement between China and Thailand was implemented, farmers in the North of Thailand suffered from cheap vegetables and fruits from China that influx into Thai

markets. Farmers growing garlic in Chiang Mai Province demanded Thai government to abolish the agreement (Manager 2008). Some of farmers growing oranges stopped to do business and changed to plant other crops or even decided to invest in neighboring countries, for those who have much more fund (Prachachat Turakij 2008).

Small-scale famers are prone to suffer from free trade agreement. Generally, they have limited fund, small plot of land, and lack of skills. All of these became a hindrance to change to grow other crops instead of the old ones. Though they can do, the new crops may not be suitable in terms of weather, soil or even consumers, which they will face higher of loss. Furthermore, if farmers adopted to grow new crops, the old ones that they are used to cultivate for generations seemed vanished. On the other hand, there is no any guarantee that the flow of vegetable and fruit imports into domestic markets will not be interrupted. The low production may cause the producing countries limit the quantity of food to export. People would be unable to purchase some kinds of food if the price is high.

In the present, the impact of climate change, free trade agreement, urban sprawl, increase of middle class, and promotion of bio-fuel has driven governments and private sectors in many countries to pay attention to food security. Agricultural development and extension have become the important policy that governments and international organizations aim to promote food security. But there are some countries having limited land, water and workforce to formulate and carry out such policies. Faced with such limitations, some countries have chosen to invest in food

crop plantations in foreign countries. In case of South Korea, Daewoo Group had leased a half of arable land in Madagascar for ninety-nine years to grow corn and palm trees. This big business group aimed to produce corn at level of five million tons in 2023 that would reduce dependency of corn imports from the United States (BBC News 2008). But the huge land leasing brought about popular demonstrations against the deal. The new political leader in Madagascar, in the later time, nullified the deal with Daewoo (Purkiss, 2009). In addition, Nonghyup Feed Inc, one of South Korea's food enterprises, initiated a plan to lease the land for planting corn in Indonesia (Bloomberg, 2009).

In case of Thailand, there are around one hundred and nineteen Thai companies have done business in planting crops or contract farming in neighboring countries. The total areas are approximately 1.17 million *rais*. The project has based on the Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy that Cambodian, Lao, Myanmar, Vietnamese, and Thai governments signed a deal. According to the agreement, Thai investors are able to import crops for sale and processing to meet the domestic demands or export to the third countries.

As mentioned above, food security is a pivotal factor for human beings; quality of life largely depends on safe and rich nourished food that helps people to have good health and can do their jobs. Accessible to food must view not only at family level but also at country and world level. A large number of families are able to search for food to meet their needs, but the others are unable to do. Such situation

cannot be considered that society has food security. The fact that each country is located in different areas and climate, some of them occupy land suitable for plantation, but some occupy arid areas. Therefore, governments must formulate measures or policies how to ensure their people to access food to meet their basic needs. To achieve the goal, governments and all parts of society must cooperate and create environments to support food security. Simultaneously, they must lessen factors that bring about food insecurity.

As food security is important for each society and country as a whole. This study, therefore, aims to investigate food security in South Korea and Thailand. Both countries are quite different in terms of economic structure. South Korea is industrialized country, but Thailand is still agriculture-based economy. Most workforces in South Korea are in industry and service sector, while in Thailand more than a half of them engage in agricultural sector. Each year food and agricultural products share a large volume of Thailand exports and still remain a main source of foreign income, while South Korea mainly exports industrial products and is one of countries that import the large amount of food and agricultural products. As many countries have encountered climate change that poses direct threats to agricultural products, the opening domestic markets for foreign products, as the free trade agreements agreed, also affect farmers due to the influx of cheap agricultural products. Though consumers have much more food to buy, on the other hand, farmers face the high level of income vulnerability. Eventually the situation likely destabilizes the

country's food security because there is no guarantee about an uninterrupted flow of food supply in case that country largely depends on food imports. The findings of this research will demonstrate how South Korean and Thai governments should promote and handle the issues of food security.

The Objectives of the Study

The objectives of the study are as follows:

1. To analyze South Korea's and Thailand's food security policy;
2. To explore the impact of climate change and free trade agreement on food security in South Korea and Thailand;
3. To investigate measures and policies of South Korean and Thai government to deal with the impact of climate change and free trade agreement on food security; and
4. To suggest alternative measures to solve the impact of climate change and free trade agreement on food security.

Expected Benefits of the Study

The expected benefits of the study are as follows:

1. Public and private organizations are able to use the research findings for formulate measures or policies to address the impact of climate change and free trade agreement on food security.
2. The findings will definitively encourage public and private sectors to acknowledge the impact of climate change and free trade agreement on food security.

3. The findings also will be used as a body of knowledge for scholars, policymakers, and officials to handle and prevent the food security-related problems and do further research.

Scope of the Study

The study involves the impact of climate change and free trade agreements on food security in South Korea and Thailand, and policies on food security of governments in both countries. The study also focuses on how both South Korean and Thai governments settle the problems. The population of the study is policy, policymakers, officials related to policy implementation, public and private organizations, civil society, scholars, businesspersons, farmers, and consumers. Data for analyzing are qualitative and quantitative. Collecting data will be conducted in South Korea and Thailand.

Preliminary Study/Literature Review

As doing preliminary study on the impact of climate change to food security, Lobell *et al.* (2008) employs General Circulation Model (GCM) and Agricultural Statistics Model to predict the impact of climate change on agricultural production in 2030, which the study covers twelve areas that are at risk of food insecurity. The study suggests that climate change will decrease the corn yield in South Asia thirty percent, rice and sorghum, which are the staple food in Africa, ten percent if there is no any measure to deal with.

According to Lee' research findings that used SRES A2 of Special Report on Emissions Scenarios (2009),

developing countries will get much more impact of climate change than developed ones. The reason is that the developed countries are in high latitude, which the increasing temperature is good for the growing of crops. On the other hand, developing countries are in low latitude, which the climate change poses negative impact on crop yield. Around the year 2020, developed countries likely will become the major food exporters for the world population (Lee 2009).

Cline (2007) suggests that if problems with the global warming have not been managed, amount of crop yield will decrease. Furthermore, if the method to increase crop yield through using more fertilizer and improving the management of water system failed to achieve the goal, agricultural sector will get more damage. If the agriculture sector shares the major part of gross domestic product (GDP), it will cause the decrease of country income.

Ingram *et al.* (2005) concludes that food security and insecurity depends on two variables: global environmental change (GEC) and social change. The degree of impact caused by each variable also depends on the extent exposing to the change and the capability to cope with and to recover from the damage. While Gregory *et al.* (2005) advises that climate change influences food system in various stages: plantation, marketing, price, sale and distribution structure. But the extent of effect on food security varies by areas and social groups.

For the impact of free trade agreements on food security, Ohga (1999) proposes that trade contributes some aspects to food security. It substitutes the gap between

production and demand for consumption, decreases the variation in supply, promotes economic growth, supports efficiency consumption of natural resources, and contributes to reasonable production in different regions. However, the dependency on foreign trade for food products may experience some uncertainty, for example the fluctuations of supply and prices, the pressures on environment, and the unbalanced trade system in which prices for exporting agricultural products are relatively cheap, but importing expensive. This situation must be coped with appropriate measures. Therefore, what extent that the import of food and agricultural products has impacted on food security largely depends on two factors: the capability to maintain the level of import that is able to meet the demand, and the certainty of access to food supply.

The study on impact of opening domestic markets for foreign agricultural products in Thailand in the late 1990s shows that Uruguay Round of multilateral trade negotiations contributes to increase the corn price four percent and the domestic demand also rises due to an increasing number of livestock that demands corn as food. There is necessary to import corn from neighboring countries. For soybean, the price of it decreases because the government cut tax from five percent to zero. This pushes the domestic demand for soybean and its products increase (Itharattana 1999).

In case of South Korea, the study conducted in the late 1990s concludes that consumers will gain benefit from opening of domestic markets for foreign agricultural products but farmers, on the other hand, will lose due to the decrease in prices of agricultural products. Such situation will affect

the growth of agricultural sector to stagnate. A number of farmers and workforce in the agricultural sector will decline; moreover, unemployment in the agricultural sector likely emerges as an obvious problem. The government must take actions to alleviate it; one of them is to invest in agricultural infrastructure. Meanwhile, it deserves to evaluate that what extent that farmers and workforce in the agricultural sector are able to handle the problem (Sung 1999).

Research Activities

The study is divided into three stages:

The first stage (the first year), the study pays attention to status of food security in South Korea and Thailand, and policies related to it. Data will be collected from documents, both printed and electronics materials. Interview and observation will also be done. After that, all data will be analyzed for the study report.

The second stage (the second year), the analysis focuses on the impact of climate change and free trade agreement on food security. The data for analyzing are the amount of rice, corn, soybean, and orange which will be classified into production, consumption, import, and export during the last five years. Then the study will project the quantity of production, consumption, import, and export in the next five years. As to demonstrate that a number of crop yields are related to climate change, the study will use data related to the amount of rainfall, the period of drought, and weather statistics for temperature and flood. For analyzing the free trade agreement having affected on food security, an in-depth interview with farmers and persons involved will

be held. On the other hand, the study will explore the roles of civil society and business enterprises related to food production, export, and import.

The third stage (the third year), based on the research findings of the first and second stages, the study will recommend alternative measures or policies that aim at promoting and enhancing food security.

Reference

Prachachat Thurakij. (2008, August 21). Orange plantation in the north of Thailand indicates

out of business, 'Thanathon' investor moved to China and Indochina. *Knowledge*

and Strategy Development Program Regarding Multilateral Environmental Agreement.

Retrieved from

http://www.measwatch.org/autopage/show_page.php?t=27&s_id=2680&d_id=2677

Manager. (2008, April 3). FTA with China still poses the Impact, Garlic Growers propose

cancellation. *FTA between Thailand and China Monitoring Group.* Retrieved from

http://www.ftamonitoring.org/Thai_china/news.asp

Agence France-Presse. (2010). Thailand wants China's help with Mekong drought: PM.

MSN News. Retrieved from <http://news.ph.msn.com/regional/article.aspx?>

Asian Development Bank. (2009). *Building climate resilience in the agriculture sector in*

Asia and Pacific region. Manila: Asian Development Bank.

Bloomberg. (2009, April 3). Korea to encourage companies to farm abroad to ensure

supplies. *Agrilandsales*. Retrieved from <http://www.agrilandsales.com/news-44.html>

Contract farming project with neighboring countries. (2007, July 9). *Government Public Relations Department*.

Retrieved from

http://thailand.prd.go.th/view_focus.php?id=2096

Cline, W. R. (2007). *Global warming and agriculture: Impact Estimates by Country*.

Washington, D.C.: Center for Global Development.

Daewoo leases African plantation. (2008, November 19).

BBC News. Retrieved from

<http://news.bbc.co.uk/2/hi/business/7737643.stm>

Economic Research Service, USDA. (2010, March 24).

South Korea: Trade. *ERS/USDA*

Briefing Room. Retrieved from [http://](http://www.ers.usda.gov/Briefing/SouthKorea/trade.htm)

www.ers.usda.gov/Briefing/SouthKorea/trade.htm

Gregory, P. J., Ingram, J. S. I. & Brklacich. (2005). Change and food security. *Philosophical*

Transactions: Biological Sciences, 360(1463), 2139-2148.

Itharattana, K. (1999). Effects of trade liberalization on agriculture in Thailand. . In M. Kanai,

B. Titapiwatanakun & Stoltz, D.R. (Eds.), *Effects of trade liberalization on agriculture in Asia* (pp. 149-153). Bogor: CGPRT Centre.

Lee, Huey-Lin. (2009). The impact of climate change on global food supply and demand, food prices, and land use. *Paddy Water Environment*, 7(4), 321-331.

Lobell D. B., Burke M. B. Tebaldi C., Mastrandrea M. D., Falcon W. P. & Naylor R. L. (2008).

Prioritizing climate change adaptation needs for food security in 2030. *Science*, 319(5863), 607-610.

Nelson, C., Gerald, Rosegrant, M., Koo, W., Robertson, R., Sulser, T., Zhu, T., Ringler, C., et al., (2009). *Climate change: Impact on agriculture and costs of adaptation*. Washington, D.C.: International Food Policy Research Institute.

Ohga, K. (1999). Trade liberalization and world food prospects in the 21st century. In M.

B. Titapiwatanakun & Stoltz, D.R. (Eds.), *Effects of trade liberalization on agriculture in Asia* (pp. 13-25). Bogor: CGPRT Centre.

Purkiss, Alan. (2009, March 19). Madagascar leader scraps Daewoo plan to grow food crops, FT says. *Bloomberg*. Retrieved from <http://www.bloomberg.com/apps/news?>

Rujiwarangkul, Rungkarn. (2010, March 20). Thailand: 51 provinces in severe drought crisis.

ReliefWeb. Retrieved from <http://www2.reliefweb.int/rw/rwb.nsf/>

Sung, M. H. (1999). Effects of trade liberalization on agriculture in the Republic of Korea with special focus on CGPRT crops. In M. Kanai, B. Titapiwatanakun & Stoltz, D.R. (Eds.), *Effects of trade liberalization on agriculture in Asia* (pp. 143-146).

Bogor: CGPRT Centre.

Suwannakij, Supunnabul. (2010, March 11). Thai rice output may drop on drought as El

Nino parches region. *Bloomberg*. Retrieved from <http://www.bloomberg.com/apps/news?>

TDRI. (1994). Thailand's drought crisis. *TDRI Quarterly Review*, 9(1), 28-29.

Thailand: Drought affects 2004/05 rice crop. (2004, December 16). *USDA*. Retrieved

from <http://www.fas.usda.gov/Pecad/highlights/2004/12/Thai04/index.htm>