Strategic Framework

for Food Management in Thailand

Thai National Food Committee

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CONTENT

Foreword

Thailand is a resource rich country with the potential to become "the world's kitchen". With the advent of globalization, however, this potential has changed dramatically along economic, social and environmental lines, which could threaten national food security.

This document presents **the Strategic Framework for Food Management** in Thailand. This Framework is a Master Plan to support food security, food safety, food quality and food education in this country. This document is also the first step in gaining the integrated cooperation of agencies from all sectors for maintaining national food production and for attaining food security at the community level. Both of these areas are important measures that will allow Thai people to gain access to safe, good quality food, while also leading to sustainable development according to Thailand's economic sufficiency policy.

Government agencies involved in food management should benefit from this document, since it can serve as a guideline for creating work plans. Educational and research institutes will also gain greater awareness and knowledge of Thailand's food situation, which can then lead to the creation of research projects to identify and to promote appropriate strategies and to move plans forward for the country.

The Secretary of the National Food Committee would like to thank the Strategic Framework for Food Management in Thailand Committee, with Prof. Emeritus Dr. Kraisid Tontisirin as Chairperson, as well as all involved agencies that took part in creating the Framework. We also are grateful to all agencies that will use this Framework to strengthen the sustainability of Thailand's food management in the future.

Food and Drug Administration
Ministry of Public Health

National Bureau of Agricultural Commodities and Food Standards
Ministry of Agriculture and Cooperatives

Executive Summary

1. Background

One objective of the National Food Committee Act 2008, which became effective on 9 February 2008, was to create a National Food Committee to serve as the main agency for national food management and to promote cooperation and the integration of budgetary and other resources during normal times as well as during emergencies. A major part of the Committee's work rests on proposing food quality standards, as well as food safety, food security and food education policies and strategies, including an emergency plan and a food alert system. These proposals are for submission to the Cabinet for approval and the assignment of responsibilities as a mean to create unity in national food management.

The National Food Committee held a 1/2009 meeting on 20 August 2009. At which time, the Committee members agreed to a resolution on the concept of a Strategic Framework for Food Management in Thailand and appointed a Committee to create the Framework.

This Committee then analyzed Thailand's food situation, as well as the food policies and strategies of domestic and international organizations. The principles of the Strategic Framework for Food Management in Thailand are:

1. To serve as a guideline for involved agencies to create their work plans
2. To encourage inter-sectoral participation
3. To provide a framework for integrating operations
4. To undertake a risk assessment
5. To be scientifically and academically sound
6. To promote sustainable benefits for the country and
7. To create a valid and responsive strategy for food security, food safety, food quality and food education

The Committee held a "brainstorming" conference on the Strategic Framework for Food Management in Thailand under the National Food Committee on 30 August 2010 at the Miracle Grand Convention Hotel, Bangkok. The conference aimed at gaining opinions and suggestions for the Framework from the National Food Committee, concerned agencies, the government, the private sector and civil society representatives. The Committee later used these valuable insights to improve the Strategic Framework.

At the 1/2010 meeting held on 22 September 2010, the National Food Committee approved the Strategic Framework for Food Management in Thailand as proposed by the Committee. The Committee then proposed the Framework to the Council of Ministers for approval. Thereafter, the Framework was given to the Office of National Economic and Social Development Board and other agencies to be used as an operational guideline and to report to the National Food Committee in the future. The Deputy Prime Minister (Major General Sanan Kajornprasart), who was Chairman of National Food Committee, proposed the Framework for inclusion in the agenda of the Cabinet Meeting held on 25 November 2010, at which time it was approved, though it was recommended that the opinions of additional agencies should be elicited in order to improve the Framework's operation.

2. Main Concept of the Strategic Framework for Food Management in Thailand

From an analysis of Thailand's food situation—including food security, food quality, food safety and food education—as well as a SWOT Analysis (strengths, weaknesses, opportunities, threats), the Framework's vision, objectives, timeframe, strategic themes, and expected outcomes were identified.

Vision

"Thailand can produce safe and high quality food and have sustainable food security for the people of Thailand and the world."

Objectives

1. To increase the efficiency of resource management for sustainable national food production.
2. To ensure that food products from households, communities and industries are of good standard, conform to food safety standards and are of high nutritional value.
3. To create food education and research systems to generate a body of knowledge on all food production aspects, including the distribution of knowledge to interested agencies.
4. To improve the efficiency of the food management system, including food related laws and information system, etc.
5. To create food security in households and communities during normal times and during emergencies.

Timeframe

Five years (2012-2016)

Strategic Theme

Four strategic themes will lead to the achievement of these objectives, namely:

Strategic Theme 1 Food Security
Strategic Theme 2 Food Quality and Food Safety
Strategic Theme 3 Food Education
Strategic Theme 4 Food Management

Strategic Theme 1 Food Security

Principle: To create food security in Thailand and to manage resources for efficient food production with the participation of all sectors

Strategies:

1. Accelerate land reform and agricultural area protection.
2. Manage water and land resources for agriculture and community forests.
3. Find a balance between food crops and energy crops production.
4. Improve food production efficiency.
5. Create motivation for agricultural as an occupation and increase the number of young agriculturists.
6. Promote food access among households and at the community level.
7. Develop and improve logistic systems for agricultural and food products.
8. Create collaboration between governmental agencies, the private sector and the Thai people for food security protection.
9. Research and develop technologies and innovations at every step of food production.
10. Create an emergency plan for food security during emergencies.

Strategic Theme 2 Food Quality and food Safety

Principle: Oversee food quality and food safety in the food production chain to protect consumers both domestic and international level businesses. This is essential to address poverty among agriculturists.

Strategies:

1. Standardize food safety and promote its implementation.
2. Improve the quality and safety of primary food products and increase their nutritional value.
3. Support and oversee food production at the community level to prevent losses and increase product value.
4. Support and oversee food production at all industrial levels.
5. Promote the trade and marketing of standard products from community and industrial levels.
6. Strengthen control and monitoring of national food quality and food safety.

Strategic Theme 3 Food Education

Principle: Focus on research and developing knowledge and awareness on resource management for food production and distribution as well as desirable consumer behaviors.

Strategies:

1. Promote collaboration and integration of all agencies involved in food education.
2. Support applied food research.
3. Create knowledge management in food education and promote the continual distribution of knowledge.
4. Promote appropriate food education among agriculturalists and communities.

5. Promote appropriate individual and community consumption behaviors.

Strategic Theme 4 Food Management

Principle: Systematically improve national food management at every step of the food production process as appropriate, as well as strengthen the operations of every agency to cope with globalization and manage threats efficiently by following international trade rules.

Strategies:

1. Improve and strengthen the structure of involved organizations.
2. Develop and improve laws related to food production.
3. Improve databases and management.

Expected Outcomes

1 Thailand has resources for sustainable food production.

2 The agricultural community has strong food production capabilities, as well as a good economic and justified management system that can create income within local and national markets.

3 Consumers have access to good quality and safe foods that are also high in nutritional value, both in terms of domestic and imported products.

4 Thailand has a good and effective food management system that can respond to any situation, both in normal times and in emergency circumstances.

5 The confidence of export buyers are strong. There is increased potential and market opportunity for Thai food products through traditional Thai cultural means, and the food products are of high nutritional value.

Introduction

Food quality and safety are among the most important factors affecting people's health, which, in turn, can promote national development in all areas, including trade and other economic aspects. Thailand is a country with high biodiversity and an abundance of resources to ensure a sufficient food supply for its people, as well as to produce a surplus for export to generate substantial income for the country. However, economic, social and cultural conditions are constantly changing. Globalization, improved technologies, emerging diseases, threats, environmental degradation, climate change and international regulations on trade and the free trade area policy can affect food security and its sustainability in Thailand if the nation's food management system, at every step of the food production process, is not administered efficiently.

In the past, overseeing Thailand's food production chain involved over 10 agencies and more than 30 Acts. This complexity led to insufficient unity, integration and efficiency, thus hindering food trade and the food industry at domestic and international levels. Moreover, Thailand also lacked clear food security policies and strategies for implementation during normal situations and during emergencies, as well as for preventing terrorist activities involving food products. Food education also had to adapt quickly to rapidly changing global trends. Consequently, the National Food Committee Act of 2008 was announced on 9 February 2008. This Act created a National Food Committee to serve as the main agency for national

food management and to promote cooperation and integration of budgetary and other resources during normal times as well as during emergencies. The Committee was given the authority to propose policies and strategies on food quality, food safety, food security and food education as well as to create an action plan and food alert system. These proposals were for submission to the Cabinet for approval and the assignment of responsibilities among involved agencies as a mean to create unity in national food management.

The National Food Committee held a meeting (1/2009) on 20 August 2009 at which time Committee members agreed to a resolution on the concept of a Strategic Framework for Food Management in Thailand. The Committee also appointed a Strategic Framework for Food Management in Thailand Committee to study food policies and strategies and to increase participation in creating the Strategic Framework for Food Management in Thailand. To achieve these objectives, the Committee analyzed the national food situation and the food policies and strategies of domestic agencies. Those policies and strategies included: the Agricultural Commodity and Food Standards Strategy 2010-2013 (Ministry of Agriculture and Cooperatives), the Master Plan for the Development of the Food Industry 2010-2014 (Ministry of Industry), the Food Safety Strategy 2003-2009 (Ministry of Public Health), and the 9th National Food and Nutrition Plan (Ministry of Public Health). In addition, the policies and strategies of other countries were reviewed in order to create a complete Strategic Framework for Food Management in Thailand.

The Strategic Framework for Food Management in Thailand, therefore, is based on Thailand's current situation, on the nation's economic sufficiency philosophy, as well as on the main strategies of

involved agencies. The Framework is also in accordance with the food management direction of other countries; it is appropriate to Thailand's context and potential; and it is consistent with the 11th National Economic and Social Development Plan. All involved sectors will participate in undertaking the Framework, which can then contribute to balanced, sustainable national development.

Concept and Methodology of the Strategic Framework for Food Management in Thailand

1. Concept

The concepts of the 11th National Economic and Social Development Plan center on development based on the nation's economic sufficiency philosophy. Thailand's monarchy is the pillar of society uniting all Thai people into a happy family of good will. Communities are strong and take part in development. The economic system is stable and has the potential to compete with others. The country has a good standard of public service. Its enforcement of laws and regulations results in Thailand having a good relationship and peaceful coexistence with its neighboring countries.

This Strategic Framework for Food Management is consistent with the concepts in the 11th National Economic and Social Development Plan. The Framework serves as a guideline for involved agencies to develop and implement their own work plans, to increase collaboration and to integrate all sectors. The Framework is based on a risk assessment of academic findings in order to achieve the best

results for national sustainability. All involved agencies from government, private and civil society sectors should cooperate to achieve the vision as follows:

> "Thailand can produce safe and high quality food and have sustainable food security for the people of Thailand and the world."

2. Methodology

A committee produced the Strategic Framework for Food Management in Thailand using the following procedures.

1. A situation analysis entailing a review of current circumstances and major domestic and international issues, a review of relevant research publications, as well as the holding of a brainstorming meeting with government officials, representatives from relevant industries, academic institutes and representatives from consumer organizations.

2. An environmental analysis using the SWOT methodology to evaluate Thailand's situation under different environmental circumstances.

3. Strategy creation for administering and managing the country's food situation when responding to differing circumstances, as well as using information from the previous two analyses to assess how other countries manage their food situations in order to create Thailand's strategic framework.

4 Holding of a "Brainstorming Conference on the Strategic Framework for Food Management in Thailand under the National Food committee" on 30 August 2010, at which time, approximately 150 participants provided opinions and suggestions on the Strategic Framework in order to improve upon it.

Part 1

Part 1

Thailand's Food Situation

Thailand is a country with high biodiversity and abundant resources to produce a sufficient food supply for consumption by the Thai people and for export to other countries. However, many factors affect production performance at all stages of the production chain, most notably those associated with resources, production, agricultural labor, etc. In the light of the National Food Committee Act, Thailand's food situation can be viewed as in Figure 1 below.

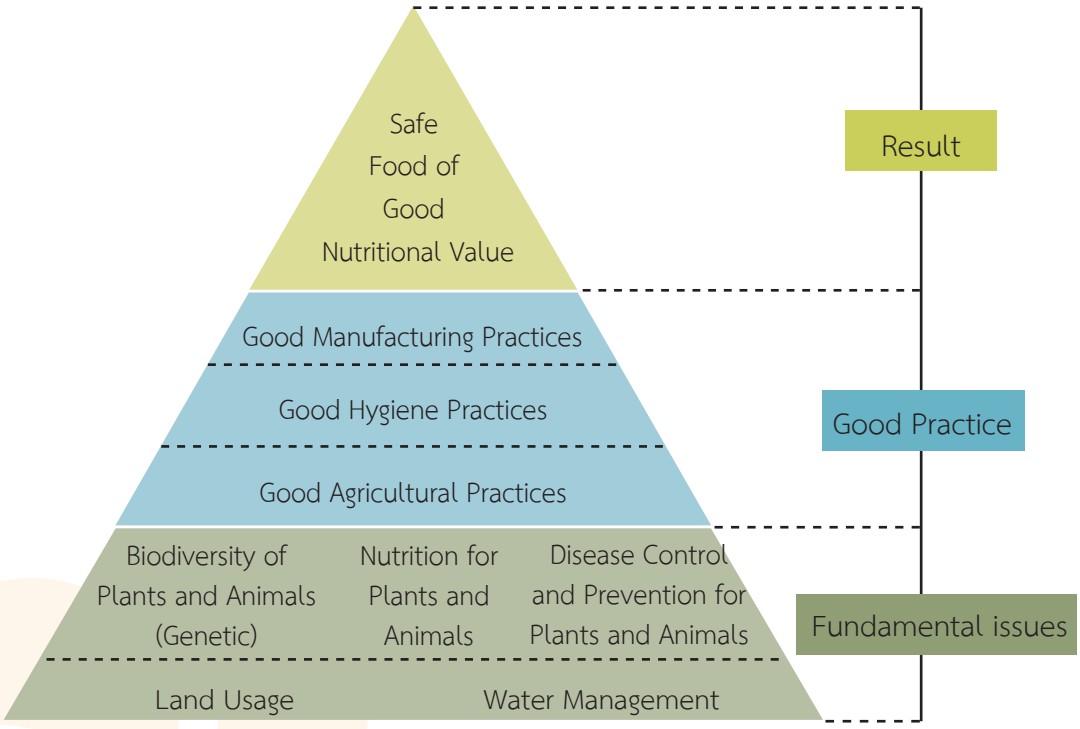


Figure 1 Food production chain

1. Food Security

According to the National Food Committee Act of 2008, "food security" means that each citizen has access to an adequate supply of food that is safe and is nutritionally suitable for all ages. Food security also means that food supplies have suitable, balanced production chain that are appropriate for the ecosystem and the natural resources needed for national food production under normal circumstances, as well as during natural disasters or terrorist attacks related to food.

The above definition means that all Thai citizens have the right to receive enough food; they have adequate production capabilities; and they can gain access to necessary resources. However, the country's natural resources are severely depleted, which has affected agricultural production and food security. Consequently, agricultural production has been dependent in part on other countries, which has resulted in higher costs. In addition, other issues have played a role, such as limitations in suitable agricultural areas, some of which are used for non-agricultural purposes. Secondly, foreign nationals have used loopholes in Thailand's laws to gain land tenure. Thailand's people thus lost their rights to land, which can decrease agricultural labor. Finally, the link between agricultural products and the agricultural industry in order to increase quality is still lacking due to inadequate inter-agency collaboration and integration. Other factors affecting food security are as follows.

1. Resources

1.1 Changes in agricultural land use patterns and land development

1.1.1 Changes in agricultural land use pattern Thailand's total land area was approximately 320.7 million Rai in 2008, of which 112.6

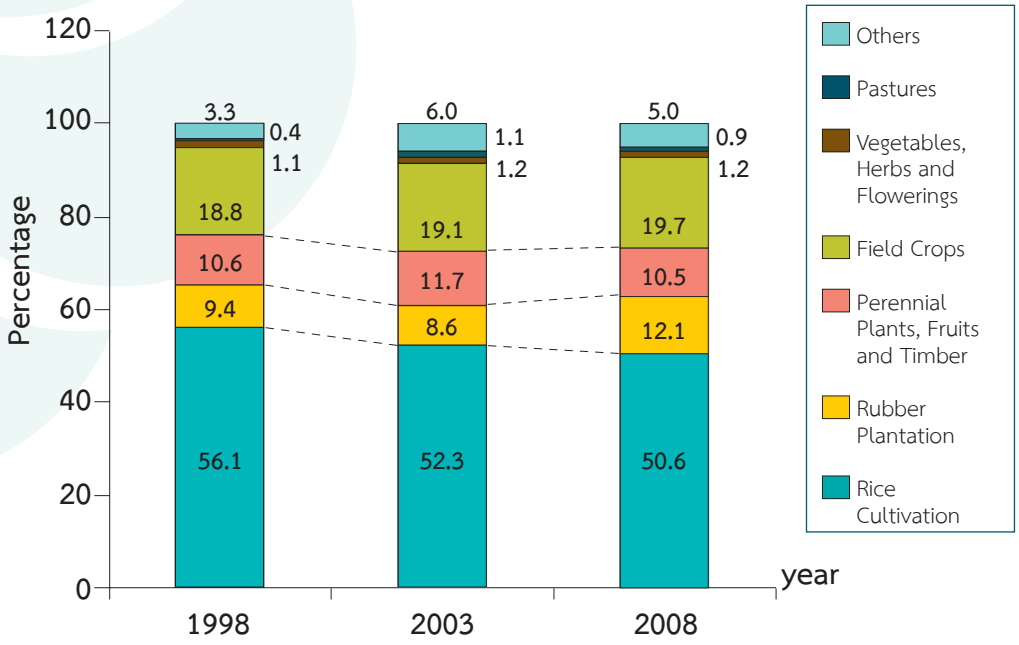


Figure 2. Agricultural land area usage, categorized by agricultural activities.
(Source: National Statistical Office, 2008)

million Rai was agricultural land. Over half of this area (50.6 percent) was used for rice cultivation, 12.1 percent for rubber plantations and 37.3 percent for other agricultural purposes (Note: 1 Rai equals 0.16 hectares or approx. 0.4 acres).

From 2003 to 2008, the rice cultivation area decreased by 2.0 million Rai (3.3 percent) while rubber cultivation area increased by around 4.0 million Rai (41.3 percent) (Figure 2).

From a study on the relationship between rural and urban changes in response to Bangkok's expanding industrial area, the case of Patumthani province showed that between 1989 and 2007 the number of factories in this province increased from 706 to 2,558, or an average of increase of 15.02 percent per year. That increase led to a progressive

decrease in the area used for agricultural production and an increase in industrial land use by 1.96 percent annually.

Land is used for other activities as well. For example, a 1994 survey by the Land Development Department in Klong Luang District, Thanyaburi and Nong Suea showed that suitable agricultural areas in the irrigation zone were used for 146 projects including housing estates, a resort and a golf course. Although the number of projects declined to 30 in the year 2000, the abandoned area has not been used for agriculture.

Overall, an increasing amount of land is being used for plantations and not for food crops. Urban areas are also expanding, leading to a reduction in agricultural areas.

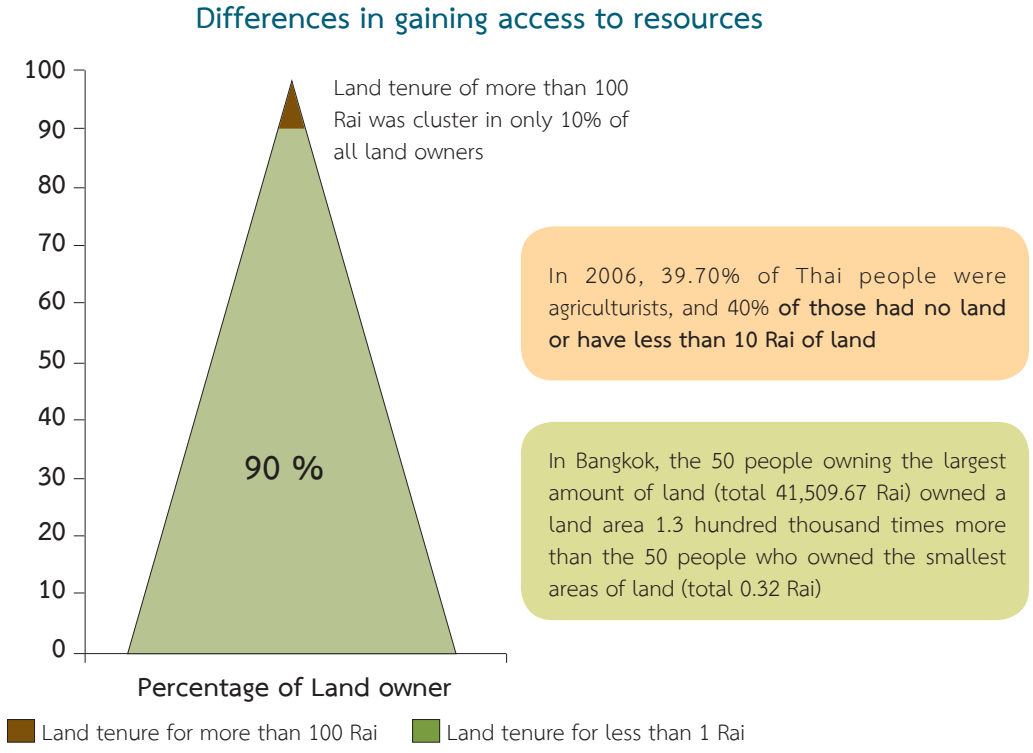


Figure 3. Differences in gaining access to resources.
(Source: The Study on land tenure and land use, and maximization of the land through economic measures and law enforcement. Land Institute Foundation. Auayporn Taechutrakul. Green World Magazine. 11(4) and Prapas Pintobtang. Bangkokbiznews. June 10, 2009.)

1.1.2 Land tenure is not distributed Data from 399 provincial land offices from all parts of the country indicate that most Thai citizens (approximately 21 million people and 1 million juristic persons) own less than 4 Rai per person, whereas a minority of the population owns larger land areas. Data show that 4,613 of such people each own more than 100 Rai of land. Of this total, 121 people own 500 to 999 Rai and 113 people own more than 1,000 Rai. For juristic persons, 2,205 own more than 100 Rai, of which 100 juristic persons each own 500 to 999 Rai, while 42 of these persons own more than 1,000 Rai. Consequently, serious application of the Land and Building Tax law would help to distribute land tenure more evenly and create career opportunities for people with low incomes (Figure 3).

1.1.3 Agricultural land tenure In 2008, 5.8 million of Thai people had agricultural land holdings. From 2003 to 2008, there was an increasing trend in small agricultural land holdings of less than 6 Rai, reaching 24.6 percent, which is considered too small for agricultural activities. As shown in Figure 4, most agricultural landowners conducted agricultural activities on their own land (75.8 percent), while 15.8 percent used their own land as well as that of others. In addition, 8.4 percent had no land holdings at all (Figure 5).

1.2 Ratio between plants grown for food and for energy production

The energy crisis and the increasing price of gasoline in the global market since 2007 has caused Thailand to focus on alternative energy sources. Government sectors have developed policies on biofuel production, such as ethanol and biodiesel from important food crops including cassava, sugar cane and palm oil. Special emphasis was placed on cassava,

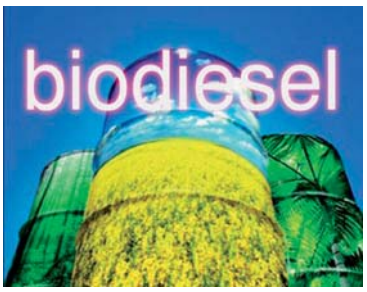


Figure 4. Agricultural land tenure, categorized by size of the land.
(Source: National Statistical Office, 2008)

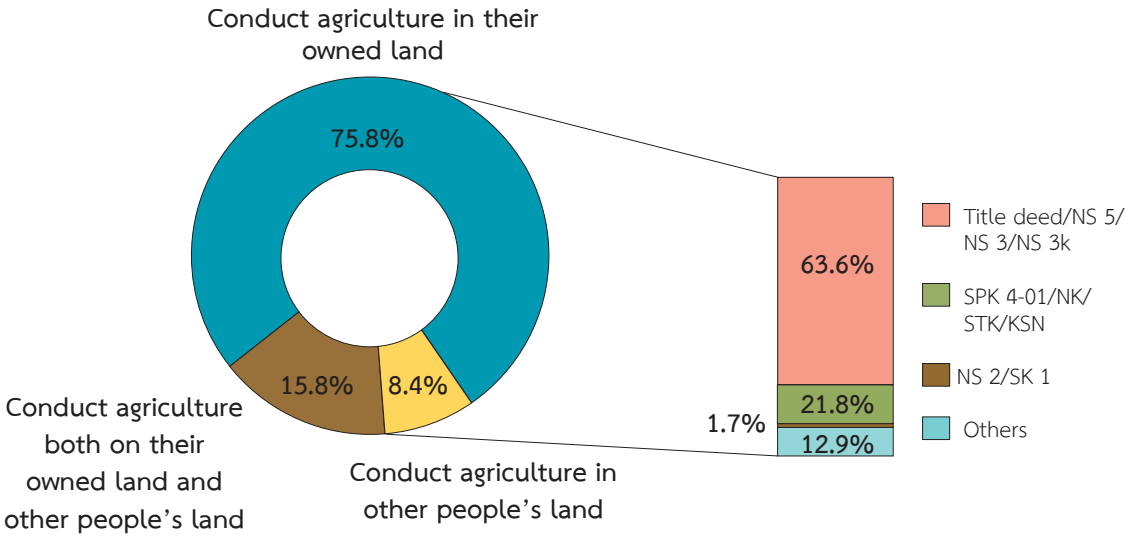


Figure 5. Agricultural land tenure, categorized by area of ownership and type of certificate of ownership in 2008.

(Source: National Statistical Office, 2008)

since it has the lowest production cost compared to other crops. In 2009, Thailand had five ethanol factories with a total production capacity of 0.83 million liters per day. By 2010, six ethanol factories used cassava as the raw material with a total production capacity of 1.77 million liters per day. Thailand began using cassava for ethanol production in 2006 and the number increased to 1 million tons in 2010 (Figure 6).

In 2009, 23 percent of Thai palm oil production was used for biodiesel production and the rest was for consumption (58%), export (9%) and stock piling (10%) (Figure 7). Fourteen biodiesel factories used palm oil with a total production capacity of 4.5 million liters per day, though actual production was only 1.5 million liters per day. Consequently, a high demand still exists for palm oil in biodiesel production, which may lead to a shift in palm oil from consumption to energy production, especially with the ever-increasing price of gasoline. This situation will affect food security.

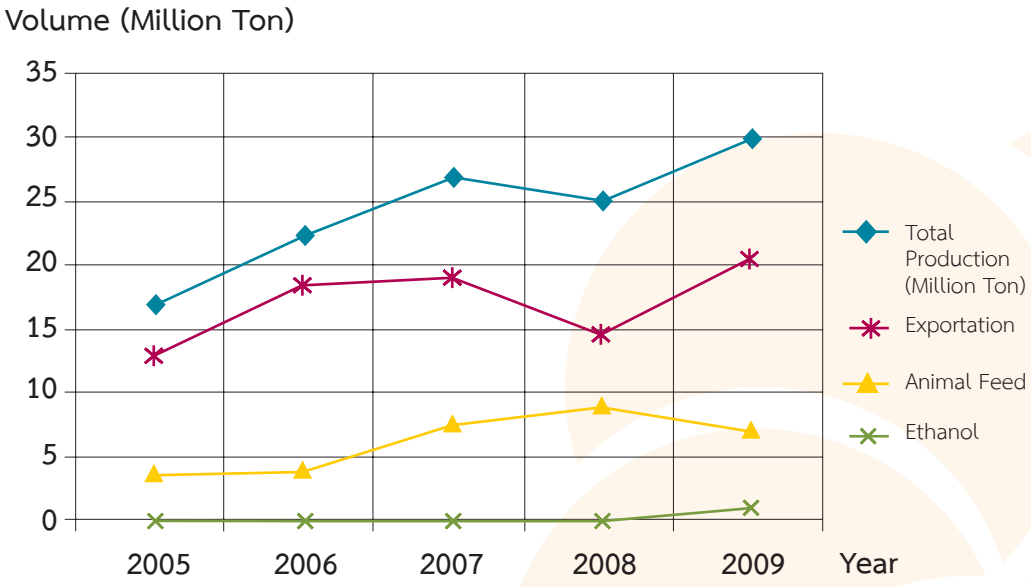


Figure 6. Demand and supply of cassava between 2005 and 2009.
(Source: Office of Agricultural Economics, 2009)

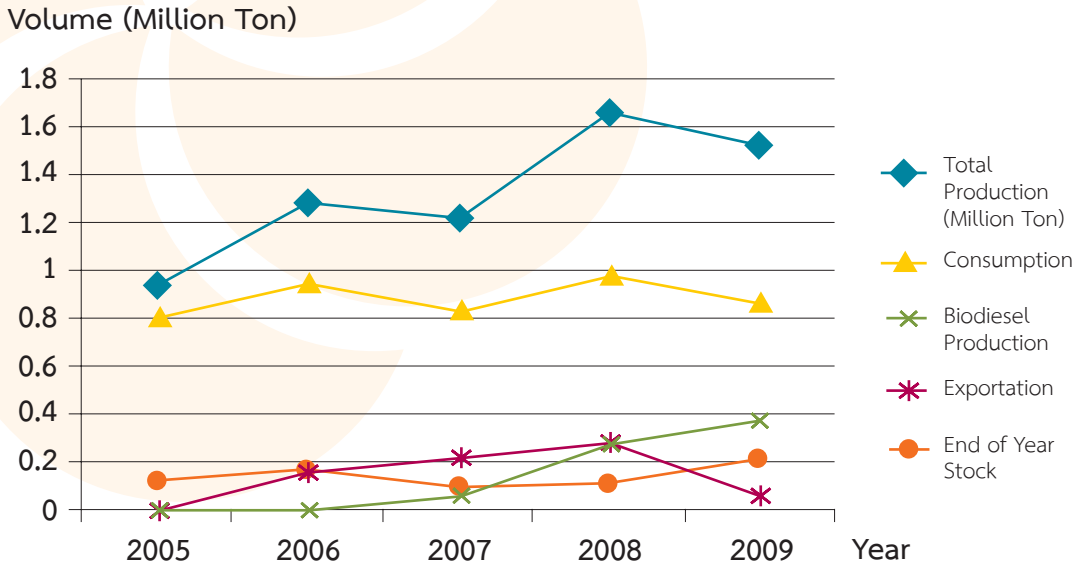


Figure 7. Oil palm demand and supply between 2005 – 2009.
(Source: Office of Agricultural Economics, 2009)

1.3 Natural resource degradation

Thailand's economy has developed for many decades to the point that it has become a medium income country. However, this development has come with a price in terms of the degradation of natural resources, their unsustainable usage and a lack of proper government management. These situations affect the country's ability to compete due to the increasing cost of environmental management.

1.3.1 Land degradation. In the past, there has been inappropriate land usage, especially before, in between and after cultivation periods. Some areas also have experienced soil erosion due to deforestation, while other areas have acidic soils or saline soil problems. In 2008, about 60 percent of the total area was affected, at an increasing rate

of 1 million Rai annually. For problematic land areas, 33 percent experienced soil erosion (around 108.87 million Rai), which is higher than the average for Asia and globally (25 and 23 percent, respectively). The worst soil erosion is in Thailand's Northern region, wherein it increases annually in severity and expansion. Other problematic issues include the lack of organic substances in the soil, which affects 98.70 million Rai, and land that is difficult to use for agriculture, accounting for 209.84 million Rai. The majority of such lands are in the country's Northern and Northeastern regions. The overall value of damage from poor land resources and inappropriate land usage is estimated to be 7,477 million Baht per year. Moreover, the lack of organic matter in the soil has forced farmers to use more chemicals, which can lead to greater land pollution issues later.

1.3.2 Deforestation Thailand's forest area is decreasing rapidly. In 1961, Thailand had 171 million Rai of forests, or 53.3 percent of the total land area. However, by 2008 the forest area had decreased to 107.7 million Rai or 33.4 percent of the total area. This decrease can affect soil fertility, biodiversity and drought.

In 1961, Thailand had 3,679 square kilometers of mangrove forest (about 2.3 million Rai). However, this area has been decreasing since 1978 because of the shrimp farm industry through out the country. Currently, an estimated 1,500 square kilometers of mangrove forest remains. Moreover, this remaining amount is under threat from such economic activities as irresponsible fishery practices, tourism without conservation awareness, and industries that produce wastewater and then release it directly into the environment. These activities degrade

mangrove and fishery resources, which will eventually affect the livelihood of the people and communities.

1.3.3 Water resources Along with suitable land, water is the most important resource for food production. Water demand for agriculture accounts for 76 percent of the total water demand in the country. One problematic aspect is that some agricultural areas (around 70 million Rai) have to rely solely on rainfall because they are outside of the irrigation zone. This situation leads to uncertainty in agricultural production due to drought, which is a consequence of deforestation and climate change.

Flooding also significantly damages agricultural areas. This situation is worsening in some areas because the same land is used for human activities, housing and road construction that can obstruct water drainage. Moreover, urban expansion and industrial growth has increased water consumption, which has led to a change in the water demand pattern and competition for water with the agricultural sector.

Low quality downstream water is another problematic issue where water from upstream areas is progressively exploited as it travels downstream. In the dry season, 35 percent of the water was unacceptable when it reached downstream. Waters from the Lower of Chao Phraya river basin, Thachin River, Bangpakong River, Lamtaklong River and Songkhla lake all are of very low quality. Consequently, a need for a water management policy for agriculture is needed.

2. Production Factors

2.1 Genetics of plants and animals used in food production

The food available in Thailand's markets is very low in diversity; for example, only eight important vegetables are available in domestic markets, namely, morning glory, Chinese kale, cabbage, cauliflower, Chinese cabbage, Chinese mustard greens, chili peppers and cucumber. There are many more varieties of local vegetables that should

be promoted for consumption. Similarly, rice is the staple food for the Thai people. Yet, only 10 rice varieties account for 90 percent of the market, while there are more local varieties of higher nutritional value and suitable for production in the local climate. Farm animals, such as chickens, are limited in terms of the range of breeds. Hence, a need exists for research into poultry breeding.

Research and development on the genetic diversity and nutritional value of plants and animals, as well as their suitability for the local climate, will benefit conservation, local economic situations and people's health.

Moreover, Thailand joined the Convention on Biological Diversity as the 188th member on 29 January 2004. Thailand thus must strengthen knowledge and management to protect the genetic resources of highly diverse plants and animals within the country.

2.2 Fertilizer and agricultural chemicals usage

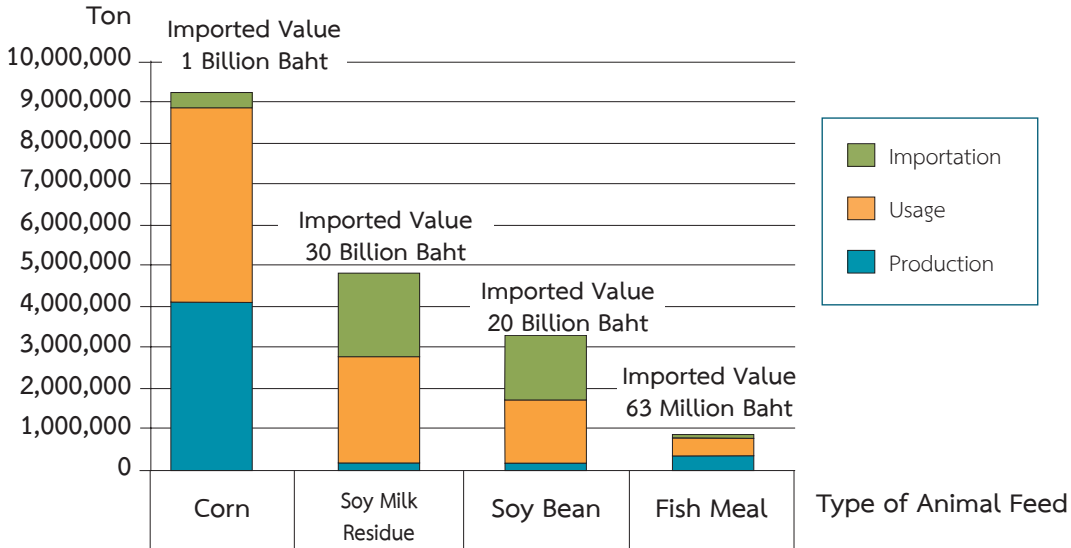
Thailand has an intensive agricultural system and thus a high demand for fertilizer. This demand increased from 321,700 tons in 1982 to 4,117,752 tons in 2009, at a total cost of 46,176 million Baht. Most fertilizers were imported. Similarly, the importation of pesticides in 2009 was 126,577 tons totaling 16,168 million Baht. These costs account for over one-third of the overall agricultural cost for Thailand.

The inappropriate use of pesticides can be harmful to workers' health. A 2003 survey of 606 of agriculturalists from six provinces revealed that almost every person showed at least one symptom of toxicity from the chemicals they used; 56 percent had moderate symptoms and 1 percent had severe symptoms. In addition, blood tests from 187 agriculturalists showed that 11 percent were at high risk. There are also issues of chemical contamination in agricultural products, which can adversely affect consumer health and product exportation.

2.3 Animal feed

2.3.1 Animal feed importation Thailand has the potential to produce many types of raw materials for animal feed. However the production of soybeans, soymilk residue, corn and high quality fishmeal does not meet domestic demand and has to be imported in large quantity. Figure 8 shows the production, consumption and importation of raw materials for animal feed in 2009. In particular, soybeans had a high rate of importation, amounting to 1.5 million tons, while soymilk residue amounted to some 2 million tons. This situation highlights the importance of policy-making and strategic planning for food and feed production.

2.3.2 Contamination in Animal feed Most animal feed is based on cereals. Hence, fungal toxin contamination is common, especially aflatoxin in soymilk residue and corn that can cause health problems. Other



	Corn	Soy Milk Residue	Soy Bean	Fish Meal
Importation	291,863	2,076,634	1,534,551	1,839
Usage	4,787,562	2,902,692	18,630,000	556,021
Production	4,430,039	190,480	190,480	500,000

Figure 8. Production, consumption and importation of raw materials for animal feed in 2009.
(Source: Office of Agricultural Economics, 2009)

fungal toxins, such as *Zearalenone* in soymilk residue, corn and cassava, can cause sickness and miscarriages in pigs, thus leading to economic losses for farmers. In 2007, *Zearalenone* was detected at a high level of 2,800 ppb in 10.8 percent of soymilk residue samples. Consequently, a monitoring program at all production cycle stages is urgently needed, starting at crop cultivation and going through transportation, processing, packaging and storage.

3. Agricultural Labor

3.1 Debt issues

Data from the Office of the National Economic and Social Development Board show that in 2009 the agricultural sector needed a large number of laborers, especially laborers with a low education because of low wages. Consequently, most poor people (2.8 million people) work in the agricultural sector, which is 68.5 percent of poor people with jobs in the countryside (4.1 million people). About 660,000 poor agriculturalists do not own land and must rent land or get hired for work (Figure 9).

Income inequality is another factor contributing to the debt issue among agriculturists. Data from the National Statistical Office show that over half (59.9 percent) of agriculturalists are in debt. The total value of debt is 364,575 million Baht. Of that value, 63.5 percent is debt held with the Bank for Agriculture and Agricultural Cooperatives, 7.4 percent is informal debt, 9.9 percent is debt held with a village fund, and the rest is debt held with other agencies, such as money and financial institutions, agricultural cooperatives and other government sources. The debt issue is more severe in the Northeastern and Northern regions than elsewhere.

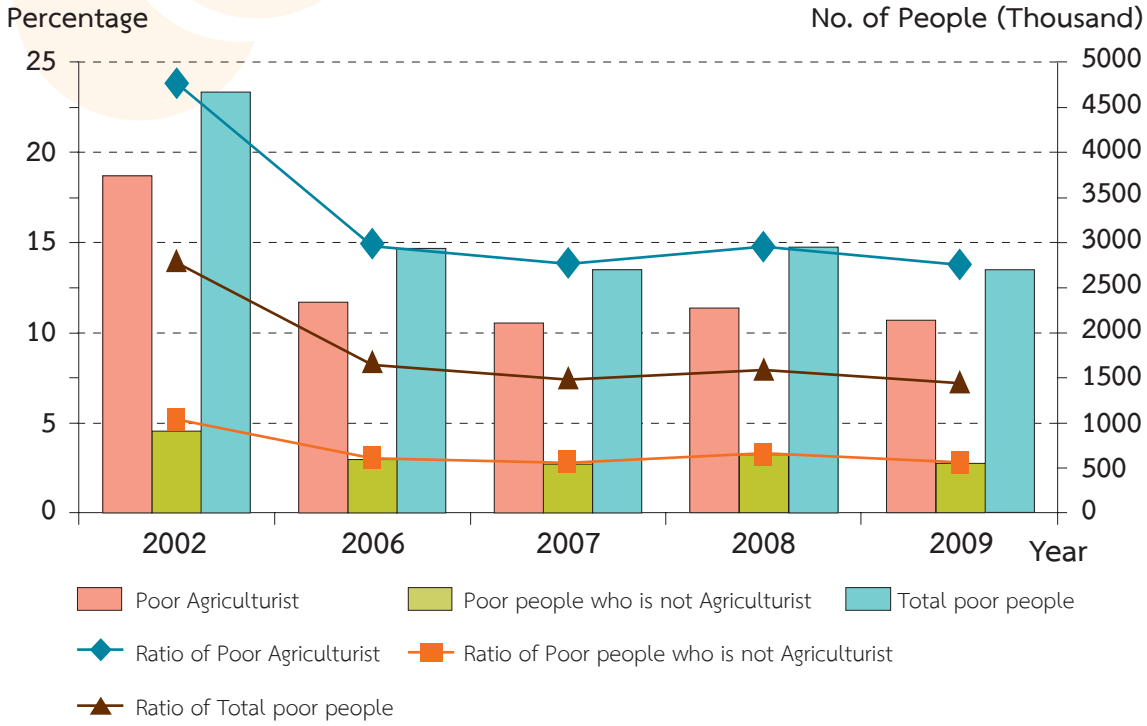


Figure 9. Comparison of poverty in agricultural and non-agricultural sectors.
(Source: National Statistical Office, 2009)

3.2 Agricultural labor structure

From 1973 to 1977, 15.3 million laborers, or 67.03 percent of the total labor force, worked in the agricutural sector. Although the overall number of laborers increased, agricultural labor actually decreased to 42.15 percent from 2003 to 2006 (Table 1), especially labor for rice production. This decrease caused the family size in the agricultural sector to decline from an average of 4.75 people per household in 1999 to 3.95 people per household in 2007. The average number of laborers per household decreased from 3.43 to 2.75 people per household. One possible factor associated with these declines is an improving educational system,

wherein the educational qualifications of children from agricultural families have improved. Thus, these better-educated children are moving to urban areas and choosing jobs outside of the agricultural sector. As a result, the average age of agriculturalists in Thailand is increasing. According to a 2008–2009 study on the debt of Thailand's rural agricultural families, conducted by the Bioway Foundation, the average age of Thai agriculturalists rose from 45 - 51 years.

The use of agricultural machinery to replace labor is increasing. This shift can increase costs and decrease net income and may aggravate poverty among small-scale agriculturalists. Eventually, this situation can lead to the loss of agricultural land and the movement of agriculturalists to cities to find new jobs.

Table 1. Total laborers in Thailand, agricultural laborers, rice production laborers and ratio of labor during 1973 to 2006

Year	Total laborer (Million)	Agricultural laborer		Rice production laborer	
		Amount (Million)	Ratio (Percent)	Amount (Million)	Ratio (Percent)
1973-1977	22.8	15.3	67.0	10.8	47.5
1988-1992	32.3	19.4	60.0	11.8	36.4
2003-2006	36.3	15.3	42.2	9.8	27.1

Note: Rice production labor is calculated from the ratio of households that produce rice to total households and multiplied by the amount of agricultural labor from the database of the Thai National AGRIS Centre, Office of Agricultural Economics (Source: Somporn Isvillanon, 2010)

4. Production Plan and Marketing

An important agricultural production issue is the high fluctuation in product quantity and price due to a lack of planning and marketing. Another issue is the low quality and productivity per Rai of some agricultural products, which makes them less competitive in the market. Although the government has promoted the GAP standard for production farms, only 254,298 agriculturalists received certification, which is a minority. The logistic system to distribute agricultural products also still lacks proper management, which affects product quality and cost. Increasing competition from free trade area policies, especially AFTA, also complicates this situation. Consequently, Thailand needs a comprehensive agricultural production strategy.

Most developed countries tend to have aging populations. As a result, consumers are focusing more on using healthy products, especially where they have high purchasing power, such as in Japan, the European Union, the Middle East and Russia. Those countries have increasingly imported products from Thailand. Consequently, food industry entrepreneurs must improve production to increase product value so that it is healthier, more convenient and of higher quality in order to be more competitive in the international market.

5. Effect of Global Climate change on Food Production

Reports from the Intergovernmental Panel on Climate Change (IPCC), which has published data continuously since 1990, note that climate change is real. They predict that by 2100, the mean global temperature will increase by 1.4 to 5.8 degrees Celsius and the sea level will rise around 0.9

meters because of melting polar ice. Floods, drought and coastal erosion will also increase in some areas, which will severely affect agriculture and food crops in particular, fisheries and biodiversity.

Moreover, climate change will also cause pest and disease epidemics, including re-emerging diseases. These epidemics will damage agriculture worldwide and create greater social problems, such as poverty, population migration, loss of local cultures and resource competition. This situation, in turn, may lead to a future conflict between the need for crops for food and those for energy production.

Data from a climate change study in Thailand show that the nation's overall temperature may increase from 0.6 to 2 degrees Celsius. There may be more days with temperatures higher than 35 degrees Celsius and fewer days of cold weather. The rainy season in the Northeastern and Eastern regions may lengthen by 1-3 weeks. However, overall rainfall will decrease with high fluctuations in many areas. Rainfall during the rainy season will tend to increase. However, it will decrease in the subsequent dry season and may cause severe water shortages for agriculturalists and consumers.

6. Impact from the Free Trade Area (FTA) and International Memorandum of Understanding (MoU)

An international MoU reflects a convergence of wills between countries, such as members of the WTO MoU. This MoU has the binding power of a contract to trade freely between participant countries with no trade barriers. Many WTO MoUs exist, such as the trade MoU, the

Agreement on the Application of Sanitary and Phytosanitary Measures, and the Agreement on Trade-related Aspects of Intellectual Property Rights. Recently, many bilateral and regional FTA exist, including the ASEAN Free Trade Agreement, the ASEAN-China Free Trade Agreement, the Japan-Thailand Economic Partnership Agreement, and the Thailand-Australia Free Trade Agreement. Each agreement has different obligations depending on negotiations between the signatories. The objective of the agreements is to attain overall benefits for each participating country. However, when each category is considered, both benefits and disadvantages arise. The same goes for agricultural and food product free trade agreements. For some products, Thailand may gain benefits from certain agreements, but the nation may also be at a disadvantage. For example, according to the ASEAN-China Free Trade Agreement, Thailand can export large amounts of tropical fruits and cassava to China, but Thailand also must import a large number of temperate fruits and vegetables from China in exchange. Consequently, studies are needed to prepare for any trade drawbacks, including strengthening the capability of producers and traders to compete with imported products, improving product quality for high-end markets, or even changing production strategies to produce other products that are more advantageous than the original ones.

7. Policy on National Food Security

Because food security is an increasingly important global issue, the Bangkok Statement was approved on ASEAN Plus Three Food and Energy Security at the 14th ASEAN summit hosted by Thailand. The statement

promoted collaboration to achieve food security and trade, which is clearly the direction that all ASEAN countries will follow.

The National Economic and Social Advisory Council included the development of the agricultural sector to increase food security for all Thai people in the 11th National Economic and Social Development Plan as a guideline for involved agencies. Consequently, the Ministry of Agriculture and Cooperatives appointed the Office of Agricultural Economics as the main agency to oversee food security and to create a food security policy to deal with the global economic crisis in 2009. This policy covered production performance, energy development, agricultural area protection and declaration of an appropriate economic zone for the sustainable production of food and consumption at community and national levels. Moreover, a declaration was included in the National Food Committee Act 2008 and submitted to the Prime Minister for approval, which authorized the Committee to propose a policy and strategy on food security. The Committee was also authorized to create an action plan and food alert system and to make suggestions on specific areas that need to be temporarily protected for the benefit of food security. The Committee can support involved agencies to work on each respective area in order to create an effective national food management system.

However, to create sustainable food security, a clear government policy and relevant laws must be revised, such as the plant and animal intellectual property law, the community forestry law, the legal framework for international trade, the legal framework for genetically modified organisms, the legal framework for agricultural land protection, the land reform policy, the international trade negotiation and investment policy, and the organic agriculture policy.

8. Food Accessibility of the Population

Another important factor that has affected food security at household and community levels is food accessibility.

8.1 Economic status

One important food security issue is that all Thai citizens must have access to food according to their rights and individual needs to create good health. Thailand is a major food producer and exporter on the global market. However, a 2009 FAO report showed that from 2004 to 2006, 17 percent of Thai people had nutritional deficiencies, which is equivalent to 10.7 million people from a population of 63 million. This situation might be partly due to changing eating habits, from consumption of a high variety of local food products to consumption of commercial crops obtained from trade. The National Statistical Office's socio-economic survey assessed food accessibility in terms of purchasing by using a "Household Food Poverty Line" for the 10-year period from 1992-2002. Survey results showed that urban and rural households have progressively less purchasing power for food over time.

This food poverty line is calculated based on the cost individuals must pay in order to gain access to food and necessary products for living. During 1988–2009, an increasing trend is seen annually (Figure 10), reflecting an increase in the cost of obtaining food (Figure 11), which can lead to individual nutritional deficiency problems.

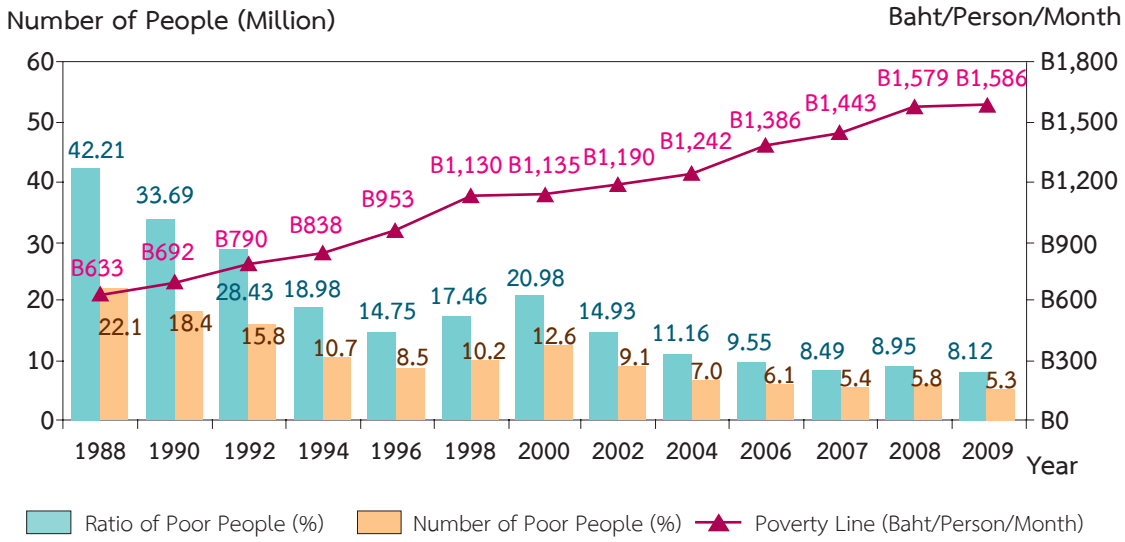


Figure 10. Poverty line, ratio of poor people, number of poor people (measure from consuming expenditure) during 1988–2009.

(Source: National Statistical Office, 2009)

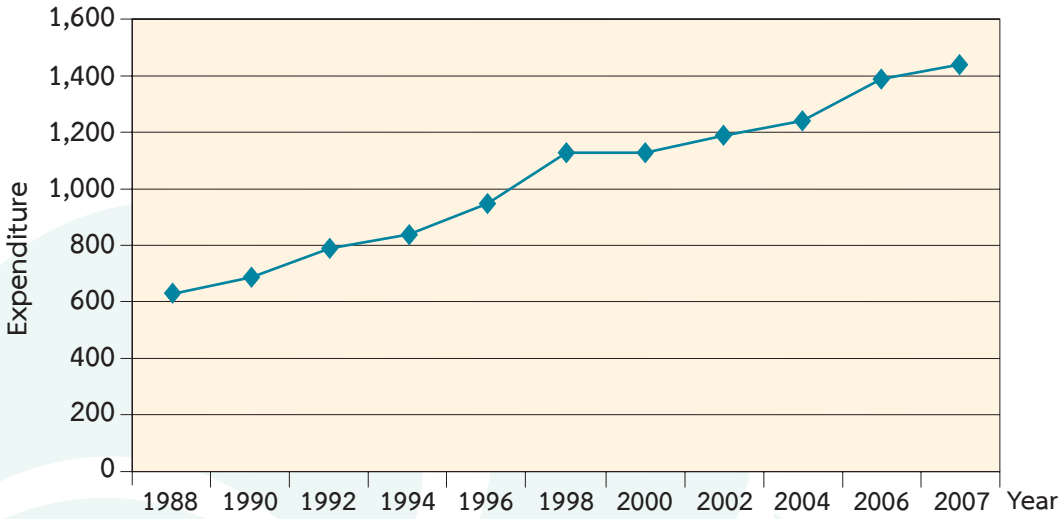


Figure 11. Increasing trend of expenditure for individuals to obtain food and necessary items for living during 1988-2007.

(Source: National Statistical Office, 2007)

8.2 Nutritional deficiencies

Nutritional deficiencies among population groups in Thailand may reflect inadequate food accessibility.

- **Protein and energy deficiency** can be due to the inadequate distribution of meat products to disadvantaged people, such as people in remote areas. Data from a nutritional surveillance program of the Department of Health during 1992–2005 revealed that the number of Thai children with protein energy malnutrition was stable at around 10 percent. However in the 2006 survey, the region with the most severe problem had changed from the Northeastern region, which was the most severe region in all previous surveys, to the Southern region.

- **Iodine deficiency** has a deteriorative affect on the brain and nervous system and can decrease children's cognitive abilities. Data from a report of an iodine deficiency prevention and control program during 2006–2008 showed that 56.8 percent of pregnant women were iodine deficient (less than 10.0 micrograms/deciliter). Even though there was a campaign to promote iodized salt throughout the country, data from a 2007 report showed that coverage was only 83.5 percent of households. This level is lower than the WHO standard, which was set at 90 percent. Other countries in the ASEAN region, including Vietnam, Laos and Cambodia, have passed this standard.

2. Food Quality and Food Safety *

1. Foodborne Diseases

WHO and FAO (1983) note the causes of foodborne illnesses to be contamination by microorganisms and harmful chemicals, such as pesticides, antibiotics, animal medicines, food additives, toxins from microorganism, and chemicals from industrial factories. These causes can affect consumer health status directly as well as the country's economy.

Data from 1999-2009 on food-borne and water-borne diseases at the Bureau of Epidemiology, Department of Disease Control, reveal that acute diarrhea and food poisoning did not decrease. Annually, there were over 1 million cases of acute diarrhea. For food poisoning during 2001–2009, the annual incidence was 223.52, 218.84, 209.03, 247.38, 226.62, 216.47, 196.39, 177.59 and 108.51 per 100,000 citizens, respectively (of 15 September 2009). However, subsequently the incidence has risen.

* There is Summary of Comments from Agencies on Strategic Framework for Food Management in Thailand in Appendix ; Ministry of Science and Technology

1.1 Foodborne diseases from microorganisms

Microorganism contamination can happen at any food production stage, including raw materials, production, transport, storage and processing before products are sold to consumers, and even inappropriate cooking practices by consumers.

In 2009, the Food and Water Borne Diseases Unit, Bureau of Epidemiology, reported 1.2 million cases of acute diarrhea, or a ratio of 2,023.64 cases per 100,000 citizens with 65 cases being fatal. The trend for the previous 10 years was increasing (Figure 12).

Microorganism contamination can be fatal or cause disability, such as fatal cases of Botulinum toxin from *Clostidium botulinum* in canned bamboo shoots, an occurrence that has been reported every year since 1997. The most severe case was in Nan province in 2003 that resulted in the infection of 163 people. The government had to mobilize 50 million baht to solve the problem, and it affected consumer confidence throughout the country.

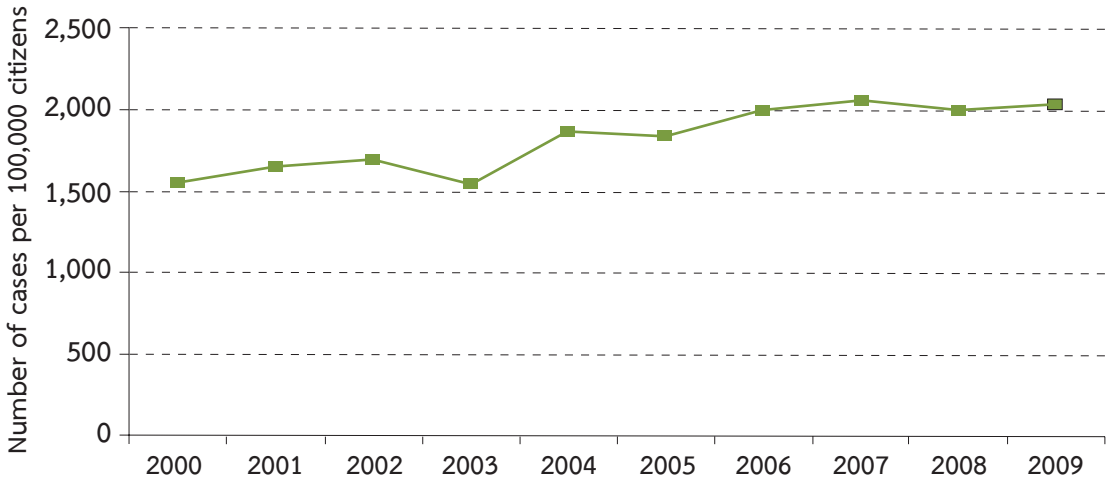


Figure 12. Acute diarrheal cases per 100,000 people (2006-2009).
(Source: Department of Disease Control, Ministry of Public Health, 2009)

1.2 Foodborne diseases from chemical contamination

Chemical contamination in food, either accidental or intentional, includes heavy metals from the environment and chemicals used in production. Contaminants may accumulate in the bodies of consumers and cause chronic long-term health problems; some contaminants may cause acute illness. Examples of chemical contaminants in food are as follows.

- **Heavy metal toxicity** Heavy metal contamination is usually found in seafood, such as shrimp, fish and squid. The common heavy metals are mercury, cadmium and lead. Although the levels of heavy metals detected are usually at acceptable levels, contamination levels appear to be increasing due to the expansion of industrial factories, such as those manufacturing paint, plastics and electrical equipment. Such factories can produce contaminated wastewater and, although some of the water is treated, untreated water may be released into rivers and the sea.

- **Pesticide toxicity** No clear evidence exists of sickness caused by pesticide toxicity in Thailand. This is probably due to the level of contamination being too low to cause acute abnormality. However, pesticides may accumulate in the body and create long-term health problems. Some evidence exists, though, of inappropriate pesticide use as shown in a survey of agriculturists' blood during 1992–2001. This survey revealed that the risk of contamination from organophosphate and carbamate pesticides was 24.19 percent among 3,816,389 persons tested. Those agriculturalists may show no signs of acute illness, but the accumulated heavy metals may cause long-term health complications.

Furthermore, a pesticide toxicity surveillance program from 1 January 2010 to 26 June 2010 reported 943 cases in 64 provinces, or 7.47 cases per 100,000 citizens. This situation reflects a dramatic increase from 2008 and 2009 with a ratio of 2.41 and 2.70 per 100,000 citizens, respectively.

- **Food additive toxicity** Methaemoglobin cases affected four students in Phra Nakhon Si Ayutthaya province on 14 May 2007. The clinical signs were pale lips, cyanosis at hands and feet, and fatigue due to red blood cells being unable to transport enough oxygen throughout the body. The cause was consumption of chicken sausage with a high level of nitrite, over 3,000 mg/kg, which is significantly higher than the standard level. At the same time, an additional 24 cases in Wiengkan District, Chiang Rai province, arose due to the consumption of fried chicken prepared according to a teaching recipe that miscalculated the nitrite amount to be used. Nitrate and nitrite taken in the long-term can increase the risk of stomach cancer.

- **Biotoxins** This condition is usually caused by the accidental consumption of a naturally toxic product, such as tetrodotoxin from puffer fish, due to a lack of knowledge. Reports of sickness have been made every year since 2000. There also were reports of deaths, which resulted in the government having to commit significant amounts of the national budget to solve the problem. Although the government announced the prohibition of puffer fish consumption in 2002, deaths were still reported in 2009.

2. Food Safety

The 2009 performance report of the Food and Drug Administration revealed major food safety risks in the food production chain.

2.1 Meat and Meat products

The products in this category are chicken and pork, since they are important to the country's economy. The food safety issues in this group are associated with chemicals and microorganisms.

(1) Chemicals Chicken and pork meat are common products that have antibiotic and beta–agonist contamination problems because of mismanagement in non-GAP standard farms. From the Food and Drug Administration monitoring program during of 2007–2009, 5.5 percent of 400 chicken and pork samples were contaminated with excessive amounts of antibiotics, and 6 percent of the 370 samples of pork were contaminated with beta–agonists.

Excessive use of food additives in food products is another major issue. Fifty percent of 550 samples had unsafe food coloring and preservatives that may be harmful to consumers.

(2) Microorganism The important pathogens are *Escherichia coli, Staphylococcus aureus*, *Clostridium perfrigens* and *Salmonella spp.* that are found in raw pork due to poor farm management, slaughtering and storage.

2.2 Milk and milk products

(1) Chemicals Although there are regulations exist that can

monitor and prohibit the distribution of milk contaminated with antibiotics, the problem persists at the farm level. Moreover, in 2008 powdered milk products from China were contaminated with melamine, which resulted in morbidity and mortality among young children. This incident caused fear among consumers and damaged the milk industry in Thailand at an estimated cost of 9,000 million Baht.

(2) Microorganisms Out of 632 milk and milk product samples, 6.49 percent were contaminated with high levels of microorganisms, the majority being from school milk. This contamination, usually due to inappropriate temperatures during storage and transport, causes the product to expire earlier than the expected date.

(3) Nutritional quality A 2007–2009 survey showed that 35 percent of 208 drinking milk product samples (including drinking yoghurt) in Thailand had a lower protein content than the standard level, possibly due to low quality cattle feed.

2.3 Cereals, dried legumes and their products

Important risks in cereal and dried legume products are from chemical sources, including fungal toxins, which are common in peanuts, peanut meal and corn, as well as heavy metals, such as cadmium and methyl bromide in rice and sulphur dioxide in rice products. From the Food and Drug Administration's monitoring program in 2009, aflatoxin contamination was found in 11.36 percent of 3,872 samples throughout the country.

2.4 Fish and fishery products

(1) Chemicals There are Nitrofuran and Chloramphenicol antibiotic contamination problems in black tiger prawns and giant freshwater

prawns, as well as Oxytetracycline and Oxolinic acid antibiotic contamination in fresh and saltwater shrimp and fish. A 2007–2009 survey revealed that 18.82 percent of 255 aquatic samples had antibiotic contamination. Other harmful chemical contaminants exist, such as borax in fish balls, frozen minced fish meat and minced fermented fish sausage.

(2) Microorganisms Contamination with *Vibrio parahaemolyticus*, *Vibrio cholerae* and Salmonela spp. in frozen black tiger prawns, frozen squid and exported frozen processed aquatic products has also occurred.

2.5 Vegetables and fruits

- Fertilizer and pesticide contamination in vegetables and fruit products has been found. A national 2002–2003 study by Sukda Srinivech, Department of Agriculture Extension incorporated within the Agriculture Office, revealed that out of 3,115 samples, 36 percent of vegetable and fruit samples were contaminated. The contamination level was 6 percent higher than the legal safety level. The vegetables with exceeding limit of contamination were Chinese cabbage, chili, coriander, Chinese kale, Chinese mustard greens and cabbage.

- Prohibited food additives and chemicals, such as food colorings, fungicides and bleaching agents, were found in 22.67 percent of 600 samples collected during 2007–2009.

- Heavy metal contamination, such as lead and cadmium in vegetables and fruits, was found in 5 percent of 260 samples collected during 2007–2009

3. Food Safety and International Trade

3.1 Food importation

Thailand is a major world food exporter. In 2009, Thailand exported 754,212 million Baht of food products consisting of: rice at 172,207.65 million Baht, canned and processed seafood at 126,692.27 million Baht, frozen shrimp at 46,088.83 million Baht and canned pineapple at 17,052 million Baht. However, Thailand still imports food, both raw materials and processed food, from other countries. In 2008, Thailand imported around 200,000 million Baht, of which 20,000 million Baht were vegetables and fruits. Importation has tended to increase because the free trade area policy increases the amount of importation. The quality of imported food products might affect consumer health. Hence, government agencies must conduct food safety surveillance for such products. From the surveillance program at the Food and Drug Checkpoint in 2009, out of 19,193 samples, 2.65 percent were products with a quality lower than the acceptable level. Vegetables, fruits and related products with pesticide contamination and inappropriate food additives were the most common cases. Heavy metal contamination, such as from lead and cadmium, in both fresh and dried Chinese mushrooms was also found.

3.2 Food exportation

Food safety is important for the health of domestic consumers and for the nation's economy. Food safety is a sensitive issue in global trade, because many countries use it to create non-tariff measures and non-tariff barriers. When a product is rejected due to food safety problems, it will damage the image of the nation's food industry and affect international trade. Thailand's food exportation still face periodic rejection,

such as when the EU detected nitrofuran contamination in shrimp products in 2002. The value of frozen shrimp exports decreased 37.14 percent from a value of 54 billion Baht in 2001 to 34 billion Baht. In addition, the avian influenza epidemic in 2004 decreased frozen chicken exports as much as 92.96 percent from 24.8 billion in 2004 to 1.7 billion Baht in 2006.

During 2009–2010, the detention of products from Thailand to the United States, including shrimp, fruits, vegetables and grains, was as high as 387 cases, although the majority of cases passed the standard.

At the beginning of 2010, South Korea rejected shrimp products imported from Thailand because of *Vibrio* contamination, which caused millions of Baht of damage to the Thai economy. However, overall food exportation from Thailand is acceptable in terms of quality and food safety. The rejection cases are very few.

3.3 International regulation on trading

International trade regulations aim at helping developing countries gain trade benefits and at promoting fair trade. However, if a country is not well-prepared, international regulations might be disadvantageous and have negative effects in three possible ways.

(1) Non-tariff barrier measures may obstruct the exportation of products from developing countries to developed countries. Such measures include environmental measures, sanitary and phytosanitary measures and anti-dumping and countervailing duties.

(2) Another disadvantage stems from increasing the role of developed countries in the operations of developing countries by increasing opportunities for foreign investors to increase investment in any particular field.

(3) Another disadvantage rests on altering government policies, the commercial sector and life style of citizens in order to adapt to new obligations or new global trends.

Important changes in regulations related to food are as follows.

(1) Non-tariff measures include environmental measures, sanitary and phytosanitary measures and anti-dumping and countervailing duty. These measures will make entrepreneurs improve their production standards in order to compete in the global market, to promote environmental resolutions, to create fairness in competition and to increase social responsibility.

(2) Regulations for protecting intellectual property aim at improving intellectual property protection, trademarks, service marks, geographical indication, product design, patent and trade secrets. These are important factors designed to promote innovation and knowledge building in order to encourage economic development.

(3) Measures involved with climate change will increase, both in the form of tariff and non-tariff measures. These regulations are such as regulations on reporting the carbon footprint from manufacturing processes, as well as greenhouse gas emissions from transportation and aviation in the EU, and also carbon tax on imported products from the United states. These climate change measures and regulations will become increasingly strict. In turn, these measures will make it more difficult for developing countries to export products to developed countries and will eventually affect trade, investment and adaptation of the industrial sector of developing countries.

3. Food Education

Improving knowledge of the food production chain can improve food products and effectively achieve desired goals. Consequently, food education is included in the National Food Committee Act. Its meaning covers processes to promote, develop, educate and raise awareness, as well as to encourage appropriate behaviors in the food production chain and in food consumption.

Food education in these areas will provide the basic knowledge needed to undertake food-related activities effectively. Those measures must cover all parties, such as agriculturalists and consumers, in order to allow them to gain access to necessary information to produce high quality, safe products that conform to the demands of domestic and international markets. Government officials must have adequate knowledge to manage and promote activities that improve food product quality and safety. A need also exists for emergency plans to cope with potential future crises. In addition, consumers must be shown how to choose good quality, safe food products in order to minimize food-borne diseases.

However, food education is not fully operating in Thailand now, largely because studies of each stage of the food production chain are conducted independently and thus lack unity. However, some involved agencies have been attempting to improve this situation, including the Office of the National Research Council of Thailand (NRCT), the Thailand Research Fund (TRF), the Agricultural Research Development Agency (Public Organization) (ARDA), the National Science and Technology Development Agency (NSTDA), the National Science Technology and Innovation Policy Office (STI), and the Office of the Higher

Education Commission (OHEC). Currently, Thailand's research funding is approximately 0.21 percent of gross domestic product (GDP) and the government has stated that this level should increase to 1.0 percent.

In order to apply research results to improve food production processes among communities and agriculturists, participation from all government, private and public sectors is necessary. Knowledge transference to all target groups is needed in order to create appropriate practices, to support national economic growth and to provide for long-term stability. The main food education considerations are as follows.

1. Knowledge of Involved Persons in the Food Production Chain

1.1 Agriculturists/entrepreneurs

1.1.1 Manufacturing management Most small-scale farmers lack the knowledge needed to link the agriculture and industrial sectors, especially in terms of distributing information and meeting market demands. This situation results in the inability of the agriculture sector to plan in advance and thus to produce products that will fulfill market demands in terms of quantity and quality. In addition, agriculturalists generally lack knowledge on proper farm management, which leads to ineffective management practices.

1.1.2 Basic Knowledge Small-scale farmers often lack information about fertilizers, hormones and other chemicals used in agriculture, such as knowledge about withdrawal times to stop using chemicals before harvesting in order to correct the safety levels of contaminants. In particular, small-scale food processors still lack knowledge about food safety, such as the safety levels of food additives.

1.1.3 Access to information Agriculturalists usually gain access to information only through uncontrolled advertisements. This situation may cause inappropriate chemical usage and lead to food product contamination, which can adversely affect consumer health on a large scale and affect national economic status because of a lack of oversight from the government sector.

Moreover, there is still a lack of marketing knowledge and the necessary regulations to improve the food industry. Important areas include market information, export regulations, raw material demand, raw material supply, food processing, product quality, relevant research results from involved agencies, knowledge about importation and health issues, and consumer information that can be used to improve and create a variety of products.

1.1.4 Awareness Some entrepreneurs and agriculturalists lack morals, ethics and the awareness to protect consumer health and the environment. Examples of this situation are the use of prohibited chemicals on the farm in order to increase production, lack of temperature control during transportation that can cause products to rot, and contamination of *Salmonella spp.*, *Staphylococcus aureus*, *Escherichia coli* and *Clostridium perfringens* in pork due to inappropriate processing and transportation. Other examples include the sale of expired products, impure products, the selling of adulterated products and sub-standard products, and over advertising.

Moreover, irresponsible entrepreneurial practices persist, such as environmental deterioration due to chemical fertilizers and pesticide contamination in the ecosystem, wasteful use of natural resources, over-fishing, and the release of non-treated wastewater from shrimp farms into natural water resources.

1.2 Government officials

- Government agencies have not developed appropriate plans to prepare an adequate official work force to cope with increasing work. A cut-off policy also exists that can reduce the work force and budget. Technology is rapidly improving, but officials do not always have adequate knowledge to operate new technologies effectively. They also lack opportunities to develop needed skills and technological knowledge.
- Knowledge related to law enforcement is lacking in local officials because the knowledge transfer from central agencies is not effective.
- There is a lack of officials and necessary research work for safety assessments of new chemicals, including overseeing, licensing and planning to solve this national problem systemically and continuously.
- There is a lack of specialists in each involved agency and an inability to develop officials to catch up with the progress being made in science and technology.

1.3 Consumers

1.3.1 Consumer behavior The life style of the Thai people is changing constantly. Data from Kasikorn Research Center in 2002 indicated that, on average, 3 million Bangkok people consumed already cooked food outside of their homes every day. Of this total, 1 million people bought foods from the road-side, which have a higher risk of contamination by microorganisms, chemicals, and other pathogens. In addition, epidemiological data have shown that 35.5 percent of consumers had been sick from food-borne diseases.

Due to a lack of food consumption knowledge, over-nutrition is on the rise. In 2009, the Department of Health reported that 2.9 percent of children aged 0-72 months were overweight, an increase from 2.0 percent in 2007. Over the last decade, the percentage of overweight Thai people aged 20–29 years rose from 2.9 percent to 21.7 percent, or an increase of 7.5 times; in the 40-49 age group, the increase was 1.7 times. Recently, a Department of Health survey reported that 18.6 percent of men and 45 percent of women aged over 15 years had central obesity. This over-nutrition problem costs the country many hundreds of thousands and even millions of Baht annually to deal with such overweight complications as high blood pressure, diabetes, coronary artery obstruction and stroke.

1.3.2 Reliable and easy access to information sources The advanced communication, marketing and advertising strategies used today are an important factor affecting consumer behavior. Such information, some of which may be misleading, can be rapidly disseminated to consumers and can cause many health risks.

1.3.3 Consumer protection rights Recently, consumer protection rights groups demanded that consumers should be able to obtain good quality and safe food products, to gain access to reliable information, to have access to laws, to sue and issue complaints, and to receive justified compensation. Consequently, involved government agencies have had to adapt and improve their strategies in order to respond effectively to such demands.

2. Research and Risk Assessment

Food production research in the areas of soil and water management, plant and animal breeding, nutritional management, and good practices throughout the food production chain will lead to high quality, safe food products. This section focuses on a risk assessment to provide entrepreneurs with the information they need to decide and to manage their strategies to improve their food products and to increase consumer benefits.

2.1 Research

Currently, food research is inadequate, especially research related to technologies and innovations to increase food production, such as research on plant and animal breeding, agricultural machinery, and on adding value to agricultural products. FAO/WHO have not yet specified the Maximum Residual Limits (MRLs) for agricultural chemicals that are used for vegetable and fruit production. While some countries have already announced their MRLs, lack of this information will negatively affect Thailand in the global market.

2.2 Food Risk Assessment

There has been no unity in food product monitoring, because the necessary information is scattered and stored at different responsible agencies. There is also a lack of risk assessment and specialists. Recent risk assessment information is not used widely, because there is no systematic data storage mechanism. This situation can place heavy demands on the budget and can be time-consuming. One important reason for this situation is that there is no main agency responsible for operating and creating a plan for risk assessment,

risk management and risk communication. Insufficient support also exists on the part of universities and research institutes to study and transfer knowledge in this field and to involve personnel in the food production chain.

4. Food Management

Thailand's present food security, food quality, food safety and food management practices may not be sufficiently effective to cope with changes and problems associated with globalization. This situation may also place the country at a disadvantage in the competitive global market and in ensuring national food security. Current food management situations in Thailand are as follows.

1. Organizational structure and related laws in the food production chain

In the past, problems associated with organizational structure and related laws in the food production chain led to the establishment of the National Food Committee Act in 2008 that promoted the integration of operations. Another challenge has been a lack of specialists in some fields, especially in areas related to increasing productivity, quality assurance and food safety in the food production chain, as well as the food management system including importation.

During a special 2008 mission of the World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations (FAO) in 2008, specialists reviewed Thailand's food safety measures and noted that there was limited coordination between the food agencies involved. This lack of integration created gaps, overlapping operations, and the ineffective use of resources by the government and private sector.

This situation can also negatively affect Thailand's exports. The specialists agreed on the establishment of a National Food Committee to gear up national food issues.

2. Policy Implementation at the Local Level through Decentralization to Local Governmental organizations

Managing the food production chain requires the cooperation of local governmental organizations. This cooperation is especially important in order to formulate local level food policies based on the local food culture, the use of local wisdom, and local food resources in order to adapt the policies and strategies to suit each locality.

Such principal is consistent with the Constitution of the Kingdom of Thailand that states that the government must decentralize administration to local organizations so they can manage their own situations. The government must allow local organizations to manage their own policies, administration, finance and authority. Government will oversee as needed through existing laws.

In the past, the central government and provincial administrations decentralized 180 duties to local organizations. There are still 65 duties to be de-centralized in the future. However, some duties have encountered problems that affect public services. The problems are as follows.

(1) No measures exist to support the decentralization of duties, policies, budget, personnel and cooperation between agencies.

(2) Local organizations have inadequate understanding of their assigned duties.

(3) Little, to no, cooperation exists between government and public sectors.

Consequently, the government must develop measures to address these issues and to support local organizations in conducting their assigned duties effectively.

3. Database and Knowledge Management

Many involved agencies, including central and local organizations, keep food information separately with little integration and cooperation to store the data systemically. Lacking a database system makes it difficult to search for desired information. This situation can lead to evaluations that are inappropriate, such as an inability to monitor harmful residues and their epidemiology, as well as to predict and analyze risks in order to set standard safety levels. In addition, the utilization of knowledge to specify policies and to develop food management systems to cover the national situation and international recognition is hindered.

4. Logistic Systems Development

A logistic system is an important factor that links production processes and consumer to complete the cycle. Logistics relates to management and production that affect product quality and cost that are fiercely competitive in the global market. Consequently, quick transportation at a low cost is an important factor. However, Thailand has high product transportation costs, which can account for 20-30 percent of overall costs. A need thus exists to identify a good logistics solution with cooperation coming from involved government agencies and the public sector.

However, Thailand may have an advantage in that it can develop into "a natural hub for the ten member nations" for Asian logistics, which can also be linked globally if properly supported. Thailand's geographical position is in the middle of Asia, and the country has better aerial and water transport potential than Malaysia and Singapore. Moreover, Thailand is situated close to China, which is a high potential market. Thus, Thailand can act as a gateway to mainland China's market.

PART 2

Part 2

SWOT Analysis

This section analyzes Thailand's food situation in terms of its strengths, weaknesses, opportunities and threats to determine the internal and external factors affecting food security, food quality, food safety, food education and food management.

1. Strengths

(1) Thailand has abundant resources to produce a wide range of agricultural and food products. It is a major exporter with a reputation for exporting good quality foods of high standard and which are readily accepted in the global market.

(2) The agricultural and food sectors are important to the economic, social, political and security concerns of the nation.

(3) Thailand has a unique culture related to agriculture and food that is well-known globally.

(4) Thailand is experienced and continuously improves its agricultural and food production capabilities in order to adapt to changing situations and consumer demand.

2. Weaknesses

(1) Many agencies are involved in the food production chain, which can lead to lack of unity and integration in management.

(2) Many agriculturalists and entrepreneurs lack important factors needed for production. They do not have access to the information needed to improve the production of safe, high quality food products.

(3) Some resources used for food production are clustered and monopolized. Such injustice, along with environmental degradation, can cause instability and decrease the effectiveness of production.

(4) Very limited government and private sector investment exists for research to develop agricultural technologies and innovations.

(5) Logistic systems in the food production chain are not effective and lead to high costs in managing agricultural and food products.

(6) Some consumers lack awareness and have inappropriate behaviors in selecting and consuming food products.

3. Opportunities

(1) Domestic and international markets are increasing their demand for good quality, safe food products with high nutritional value.

(2) Thailand has a positive image as an important food producer regionally and globally. This image can be beneficial in increasing product value for agriculturalists and other involved sectors, including sustainable tourism.

(3) Food is an important product with high market demand. This demand could even increase during emergencies and disasters in the region.

(4) The geographical location of Thailand is suitable for food production and food trading.

(5) Thailand can develop new agricultural technologies and innovations to improve the food production chain effectively that, in turn, can increase the country's productivity.

4. Threats

(1) Agriculture is not an attractive, or popular, occupation among Thailand's younger generations and they are less likely to participate in it. Persons working in agriculture are likely to be progressively older people. Moreover, many agriculturalists are still poverty-stricken and in debt.

(2) New threats are on the horizon that can affect agriculture, food, trade and health. These threats include global warming, natural disasters, the emergence of new diseases in animals that may be transferable to humans, and biological terrorism using food.

(3) There are more new competitor countries in the global market, particularly countries with lower production and labor costs.

(4) The increasing number of regulations related to food safety and non-tariff measures can impede international food trade.

(5) The increasing demand for crops and related plants for energy and animal feed production can limit the resources needed to produce food and hinder food security.

PART 3

Part 3 Strategic Framework for Food Management in Thailand

Based on Thailand's food situation in terms of food security, food quality, food safety, food education and the SWOT Analysis, the Strategic Framework's vision, objectives, timeframe, strategic themes and expected outcome are specified as follows:

1. Vision

"Thailand can produce safe and high quality food and have sustainable food security for the people of Thailand and the world."

2. Objectives

(1) To increase the efficiency of resource management for sustainable national food production.

(2) To ensure that food products from households, communities and industries are of good standard, conform to food safety standards and are of high nutritional value.

(3) To create food education and research systems to generate a body of knowledge on all food production aspects, including the distribution of knowledge to interested agencies.

(4) To improve the efficiency of the food management system, including food related laws, information, etc.

(5) To create food security in households and communities during normal times and during emergencies.

3. Timeframe

Five years (2012-2016)

4. Strategic Themes

Four strategic themes will lead to the achievement of these objectives, namely:

Strategic Theme 1 **Food Security**

Strategic Theme 2 **Food Quality and Food Safety**

Strategic Theme 3 **Food Education**

Strategic Theme 4 **Food Management**

Strategic Theme 1 Food Security

Principle : To create food security in Thailand and to manage resources for efficient food production with the participation of all sectors.

Strategy 1 Accelerate Land Reformation and Agricultural Area Protection*

Specific Outcome : Equity in access to agricultural resources is achieved at every level and areas used for agricultural food production are protected.

Initiatives :

1. Improve laws related to land tenure and land rental.
2. Enforce existing laws intensively, such as taxes on agricultural land which is not used for agricultural purposes, protection against trespassing on agricultural areas, and restriction of land tenure by foreign nationals.
3. Encourage development of agricultural land protection laws to be enforced as soon as possible.
4. Prevent agriculturalists from selling agricultural land for other purposes, which may take the form of legislative measures or economic motivation.

Strategy 2 Manage Water and Land resources for Agricultural and Community Forests

Specific Outcome : Increased efficiency of water and land management for agriculture and increased community participation in this process.

Initiatives :

1. Increase the efficiency of water management and search for new water resources to meet agricultural demands. Investment should give first priority to agricultural and food production.**

* There is summary of comments from Office of the Council of State in the Appendix.

** There is summary of comments from Ministry of Science and Technology, and Office of the Council of State in the Appendix.

2. Promote and encourage communities to participate in conserving forests, mangroves and community forests in local areas by supporting local scholars to lead the activity.
3. Rehabilitate and improve resources on agricultural lands.

Strategy 3 Find a Balance Between Food Crop and Energy Crop Production*

Specific Outcome : Thailand has appropriate and sustainable food and energy security

Initiatives :

1. Specify a clear economic policy on promoting alternative energy from crops in order to prevent a threat to crops used for food production that will affect food security of the country.
2. Implement zoning for energy crops and food crops.
3. Focus on using crops with a low price consideration or crops aimed for exportation to produce energy.

Strategy 4 Improve Food Production Efficiency**

Specific Outcome : Increased production of food products that are safe, of high quality and are of sufficient nutritional value for consumption by the Thai people.

Initiatives :

1. Promote zoning for suitable agricultural products to maximize production efficiency.
2. Create innovations and technologies for the food production chain in each locality to increase production efficiency.

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* There is summary of comments from Ministry in the Appendix.

** There is summary of comments from Office of the National Economic and Social Development Board in the Appendix.

3. Promote economic integration to strengthen production power, to improve primary products and to create higher value products, such as using local cultures regarding food and agriculture as a means to promote local tourism.*

Strategy 5 Create Motivation for Agriculture as an Occupation and Increase the Number of Young Agriculturists

Specific Outcome : Increased security and the attractiveness of agriculture as an occupation

Initiatives :

1. Promote and support agriculture and food production education in schools and communities.
2. Promote and support junior agriculturalists and provide greater opportunities for agriculturalists to gain new knowledge and apply it in the food production chain, as well as linking it to culture, ethics and marketing.
3. Encourage small-scale farmers and farmers' groups to produce good quality, safe food products using a contract system with buyers, such as hospitals, schools, hotels and the industrial sector.
4. Integrate agricultural land distribution, workshops, agricultural lending and marketing in order to create greater security for agricultural careers.
5. Promote the role of agricultural and food educational institutions in providing knowledge and increasing the production efficiency of agriculturists.
6. Develop an income guarantee system and a social welfare system to cover all agriculturists.
7. Applaud and announce the merits of agriculturalists at every level to encourage them to be proud of their careers. In addition, take action against foreign agriculturalists with justification.

Strategy 6 Promote Food Access Among Households and at the Community Level

Specific Outcome : The Thai people gain access to necessary foods and create food security at the community level.

* There is summary of comments from Ministry of Tourism & Sports in the Appendix.

Initiatives :

1. Promote local people to become agriculturalists on their own land. This initiative could include growing local crops or crops of high nutritional value, using local animal breeds and local fisheries in order to create a "food bank" to reduce reliance on outside products. Storage of foods for emergency situations should also be promoted.
2. Promote agricultural practices that follow the nation's "economic sufficiency policy" so that each household can be self-reliant, thus contributing to sustainable economic and social systems.
3. Develop and distribute knowledge to the Thai people to create appropriate food consumption behaviors among urban and rural communities.
4. Support involved government agencies or local authorities to improve food security in every aspect and oversee the nutritional needs of the Thai people of all ages.*
5. Specify measures to increase income stability from food production by agriculturalists and those persons working in related occupations. In addition, focus on solutions to the debt crisis among agriculturalists so they can gain access to sufficient and appropriate foods.

Strategy 7 Develop and Improve Logistic Systems for Agricultural and Food Products**

Specific Outcome : Increase food distribution efficiency with regard to food safety and quality.

Initiatives :

1. Accelerate infrastructural development in terms of the collection and distribution of agricultural and food products and link them to transport development, including land, water and aerial transportation.
2. Link demand to supply through production planning and marketing to meet the demand of buyers at community, national and international levels;

* There is summary of comments from Ministry of Foreign Affairs in the Appendix.

** There is summary of comments from Ministry of Transport in the Appendix.

for example, in the cooperative system, futures contracts and a central agricultural market place.

3. Promote and support research on technologies and innovations that increase the efficiency of the logistics system for food and related products. This initiative should include container transportation, as well as information systems for trade and marketing.
4. Promote the development of community markets to increase their effectiveness and ability to link with other communities, including strengthening marketing and local tourism.

Strategy 8 Create Collaboration Between Governmental Agencies, the Private Sector and the Thai People for Food Security Protection*

Specific Outcome : Creation of collaborative networks in every operating unit that plays an active role in protecting food security

Initiatives :

1. Create collaboration through existing laws, such as the Community Organizations Development Institute Act and the National Farmers Council Act.
2. Promote social responsibility in the private sector in terms of collaboration with communities to create food security.
3. Encourage local governmental organizations to take greater action and allocate increased budgets for agricultural development and product processing.
4. Seek collaboration from neighboring countries in food production and animal feed supply.

Strategy 9 Research and Develop Technologies and Innovations at Every Step of Food Production**

Specific Outcome : Increased efficiency in research and development in order to increase capabilities within the food production chain.

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* There is summary of comments from Secretariat of the National Security Council and Ministry of Interior in the Appendix.

** There is summary of comments from Office of the National Research Council of Thailand in the Appendix.

Initiatives :

1. Support research on the food production chain, such as land and water management for food production, plant breeding, plant nutrition, disease control among plants, terrestrial and aquatic animals, good agricultural practices and healthy eating behaviors.
2. Support research on increasing the production potential of communities and industries.
3. Encourage private sector investment and cooperation to increase food production efficiency.
4. Support research on new technologies and innovations that small-scale farmers can readily apply.
5. Support research on genetics and the breeding of plants, animals and fish for genetic and genome conservation and to increase food production.

Strategy 10 Create an Emergency Plan for Food Security During Emergencies*

Specific Outcome : Sufficient food is available during emergency circumstances.

Initiatives :

1. Make use of the National Food Committee Act to manage food security in emergency circumstances. Clearly specify an effective action plan and operational strategy.
2. Create prevention plans to avoid shortages of imported raw materials and animal feed. This initiative could be achieved by promoting domestic production of products that are usually imported. In addition, identify additional exporters, find alternative raw materials and adjust production, trade and stock piling.
3. Support and expand regional collaborative networks for food security, such as the ASEAN rice stock, and especially among neighboring countries to gain support in an emergency.

* There is summary of comments from Ministry of Science and Technology and Secretariat of the National Security Council in the Appendix

Strategic Theme 2 Food Quality and Food Safety*

Principle : Oversee food quality and food safety in the food production chain to protect consumers and both domestic and international businesses and to address poverty among agriculturists.

Strategy 1 Standardize Food Safety and Promote Implementation

Specific Outcome : Increased national confidence in food security

Initiatives :

1. Improve Thailand's standards in order to conform to international standards in the food production chain.
2. Encourage involved personnel to follow specified standards, such as creating operating manuals or instructional manuals, and encourage entrepreneurs to join the standard system, either voluntarily or through law enforcement.
3. Collaborate on enforcing existing laws that are relevant to each government agency.

Strategy 2 Improve the Production of Primary Food Products to Meet Quality and Safety Standards and Increase Their Nutritional Value

Specific Outcome : Improved quality and safety standards for agricultural products that are used for consumption and manufacture.

Initiatives :

1. Promote research and development on breeding and disease control among plants as well as terrestrial and aquatic animals, including considerations regarding the qualities of soil, water and fertilizer, to increase the value of agricultural products in terms of quality, safety and nutrition.

* There is summary of comments from Ministry of Science and Technology in the Appendix.

2. Promote Good Agricultural Practices (GAP), use group certification to increase the number of farms with the GAP standard, and provide support for healthy agricultural practices, such as Biodynamic Agriculture, Organic Agriculture and the Integrated Pest Management System.
3. Develop a farm-level standard production model to create and transfer knowledge to agriculturalists.
4. Create various motivational mechanisms, such as marketing and social responsibility, to encourage agriculturalists to join standard farming systems; usually the focus should be on economic motivation.
5. Encourage nearby agriculturalists who produce similar products to organize a cooperative group in order to improve mutual support and product value.

Strategy 3 Support and Oversee Food Production at The Community Level to Prevent Losses and Increase Product Value

Specific Outcome : Communities are the focus for producing safe, high quality food products

Initiatives :

1. Promote research and development to create a body of knowledge, innovations and appropriate technologies with regard to local wisdom covering pre- and post-harvesting techniques, storage, extending shelf life, and added value at household and community levels.
2. Encourage cooperative groups and create networks to transfer of knowledge to communities and increase good practices.
3. Improve household and community-level food preservation and processing practices to prevent product losses and increase product value, such as in fruit and vegetable processing.
4. Promote the use of local wisdom to add value to products to improve market attraction.

5. Promote local and regional collection and packaging stations as a mean to increase monitoring capabilities and to improve product quality.
6. Promote the use of agricultural waste for environmental conservation purposes, such as making fertilizer and biofuel.

Strategy 4 Support and Oversee Food Production at all Industrial Levels

Specific Outcome : Increased industrial capability to produce high quality, safe food products.

Initiatives :

1. Improve food production processes to reach national and international standards.
2. Promote implementation of an industrial quality assurance program, such as GMP and HACCP.
3. Conduct research on adding value to various types of food products, including quality improvement, extending shelf-life, product development and packaging. In addition, promote commercialization and encourage the private sector to invest more in food product research, either independently or in collaboration with the government sector.
4. Create motivation in order to improve food production standards at every level, especially financial and tax incentives, and to encourage small- and medium-sized entrepreneurs to join the standard system.

Strategy 5 Promote the Trade and Marketing of Standard Products from Community and Industrial Levels

Specific Outcome : Domestic and international consumers gain confidence in Thai food products in terms of their quality, safety and nutritional value, which can eventually decrease trade barriers and thereby create more trade.

Initiatives :

1. Educate domestic and international consumers using information that is distributed through various media to improve their confidence and understanding about the importance of safety standards and food production. This initiative will enable them to choose food products produced in Thailand.
2. Encourage consumers to be aware of their consumer protection rights and support consumer rights organizations.
3. Create networks of producers of good quality products and link these producers to appropriate factories, markets and buyers to maintain trade stability.
4. Support standard food products by organizing domestic and international exhibitions, road shows, business matching and seasonal local food festivals. This initiative would promote the quality, safety, variety, good taste, nutritional value and food culture of Thai food products.
5. Study trends, changing demands, consumer behaviors, as well as trade regulations regarding food products.
6. Encourage entrepreneurs to promote suitable images, food quality and food safety as selling points for food products, such as brand logos and geographic indication, rather than promoting only low prices for competition.
7. Encourage consumers to choose products with approved standard certification.

Strategy 6 Strengthen Control and Monitoring of National Food Quality and Food Safety*

Specific Outcome : Consumers are protected, fairness is reached and trade is facilitated

Initiatives :

1. Strengthen quality assurance systems and monitoring according to international standards to control product quality for domestic and international trade.

* There is summary of comments from Ministry of Interior in the Appendix.

2. Promote a private standard inspection agency to certify food products. Support entrepreneurs to create their own monitoring programs to ensure the quality of imported and/or exported products. In addition, support community or consumer groups to create their own food product-monitoring programs.
3. Improve the efficiency of government and private laboratories to inspect food product quality. Support private laboratories to expand their role in commercial inspection.
4. Use a tracking system or other means of verification as tools for determining the causes of contaminated foods and their resolution.
5. Improve the efficiency of agencies involved in food risk assessment to gain scientific evidence to use in trade negotiations, which will reduce arguments during negotiations.
6. Improve and update regulations on food product import or codes of practice in order to create a balance between consumer protection and trade. This initiative will also facilitate concordance with obligations to the WTO.
7. Integrate the quality and safety assurance of agricultural products and imported food products by enforcing existing laws and regulations effectively.
8. Standardize inspection of agricultural and food products among international agencies and trade partners in order to make Thai inspections reliable and facilitate trade.

Strategic Theme 3 Food Education

Principle : Focus on research and developing knowledge and awareness on resource management for food production and distribution as well as desirable consumer behaviors.

Strategy 1 Promote Collaboration and Integration of All Agencies Involved in Food Education *

Specific Outcome : Strategies developed for integrating operations and making the best use of limited resources.

Initiatives :

1. Integrate government and private sectors in terms of policy, resource usage including personnel, media and budget, as well as research funding and practices.
2. Promote local governmental organizations and other local agencies to take part in food education.
3. Encourage the private sector to support food education.

Strategy 2 Support applied food research **

Specific Outcome : Efficiently managed research directions and effective use of existing resources

Initiatives :

1. Focus on research that requires integrated knowledge with more than one subject area for problem solving. Promote cooperation among involved institutes and encourage stakeholders to take part in the research.

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* There is summary of comments from Ministry of Science and Technology, and Ministry of Education in the Appendix.

** There is summary of comments from Office of The national Research Council of Thailand in the Appendix.

2. Support food research to cope with changes in technology and the global situation, such as climate change, global trade and regional economic integration.*
3. Conduct research and promote the application of existing local wisdom to develop innovations and new knowledge.

Strategy 3 Create Knowledge Management in Food Education and Promote the Continual Knowledge Dissemination

Specific Outcome : Food knowledge has been complied, analyzed, synthesized and transferred to improve food products in all aspects.

Initiatives :

1. Compile food knowledge and practices from domestic and international studies for ease of exploration (searching) and distribution.
2. Promote the application of food knowledge related to the food production chain in order to gain practical achievements.
3. Promote food education related activities in the education system and support the food production chain.

Strategy 4 Promote Appropriate Food Education Among Agriculturalists and Communities

Specific Outcome : Agriculturalists and local communities can develop and make use of food related innovations and technologies to increase efficiency and achieve sustainable results.

Initiatives :

1. Encourage agriculturalists to gain knowledge and skills related to food education and be able to combine local wisdom with new technologies or knowledge.

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* There is summary of comments from Ministry of Foreign Affairs in the Appendix.

2. Encourage the collaboration of community agriculturalists in order to obtain and improve upon knowledge of food education and application.
3. Support the use of information technology in communities in order to translate food education into real practices.

Strategy 5 Promote Appropriate Individual and Community Consumer Behaviors

Specific Outcome : Each individual has the knowledge and understanding of how to be a good food producer; each individual has appropriate food consumer behaviors; and communities have suitable environments for supporting good consumer behaviors.

Initiatives :

1. Support community leaders, such as local scholars, outstanding agriculturalists and village health volunteers, to improve consumer behaviors among community members.
2. Support activities or projects that aim to solve inappropriate consumer behaviors in large cities and in rural areas, and with the participation of schools and communities.
3. Increase channels and improve communication and education mechanisms in order to help consumers to adopt behaviors that focus on quality of life and to seek suitable consumer information.
4. Develop suitable food consumption indicators for consumers.
5. Promote evaluations of inappropriate consumer health behaviors in order to solve malnutrition problems.

Strategic Theme 4 Food Management

Principle : Systematically improve national food management at every stage of the food production process, as appropriate, as well as strengthen the operations of every agency to cope with globalization and manage threats efficiently. Follow international trade rules.

Strategy 1 Improve and Strengthen the Structure of Involved Organizations*

Specific Outcome : Participatory cooperation and integration of the food production chain is achieved among all involved agencies at every level.

Initiatives :

1. Revise the missions of all involved organizations to specify their roles clearly and to eliminate gaps and redundancy in operations. Study the possibility of creating a permanent organization that can take responsibility for continually promoting a national food management strategy.
2. Develop networks between all involved organizations from every sector.**
3. Promote and participate in decentralization, in the delegation of authority, and in the integration of operations for consumer protection to eliminate gaps and redundancy in Thailand's food management.
4. Adjust the personnel plans of governmental organizations to suit their missions in terms of the number of staff, human resources development and budget allocation. In addition, consider revising missions to correspond to such changes.
5. Develop an evaluation system including indicators to improve policies and operating plans appropriately.

* There is summary of comments from Office of the National Economics and Social Development Board, Bureau of Budget, Ministry of Public health, and Ministry of Industry in the Appendix.

** There is summary of comments from Ministry of Foreign Affairs in the Appendix

Strategy 2 Develop and Improve Laws Related to the Food Production Chain

Specific Outcome : Laws related to food are developed and improved to ensure that they are inclusive, up-to-date and in accordance with international regulations. All involved operations can accomplish their goals effectively even under uncertain situations.

Initiatives :

1. Develop and improve the food production laws and regulations of all involved organizations to make them inclusive, up-to-date and in accordance with international regulations, to make them practical in terms of application, and to increase the participation of all involved sectors, such as the Draft of Agricultural Land Protect Act.
2. Monitor and evaluate difficulties in law enforcement to improve them according to current and changing situations.
3. Promote law enforcement in order to integrate existing laws within all involved organizations and to increase operational efficiency.

กลยุทธ์ที่ 3 Improve Databases and Management *

Specific Outcome : Cooperation and integration of food information networks are achieved in every dimension, and all involved sectors and organizations can easily gain access to useful information to improve their operations.

Initiatives :

1. Specify the direction and promote cooperation, the linkage and use of information to solve the nation's food problems.
2. Systematize food information and create networks to link existing data from all involved organizations throughout the country. In addition, keep the data up-to-date and ensure that all involved sectors and organizations can gain access and obtain useful information to improve their operations.

* There is summary of comments from Secretariat of the National Council in the Appendix.

3. Develop and implement the existing Food Alert System among all involved organizations to create an effective alert system.
4. Monitor Thailand's food situation through the analysis and synthesis of every dimension for use in policy development and operational system improvements.

5. Expected Outcomes of the Strategic Framework

(1) Thailand has resources for sustainable food production.

(2) The agricultural community has strong food production capabilities, as well as a good economic and justified management system that can create income within local and national markets.

(3) Consumers have access to good quality and safe foods that are also high in nutritional value, both in terms of domestic and imported products.

(4) Thailand has a good and effective food management system that can respond to any situation, both in normal times and in emergency circumstances.

(5) The confidence of export buyers are strong. The potential and market opportunity for Thai food products are increased through promotion of traditional Thai food culture and high nutritional value of Thai food.

Strategic Framework
for Food Management in Thailand

Summary of Involved Organizations in The Food Management Strategy of Thailand

Strategy	Organization
Strategic Theme 1 Food Security	1. Ministry of Defense 2. Ministry of Finance 3. Ministry of Foreign Affairs 4. Ministry of Tourism & Sports 5. Ministry of Agriculture and Cooperatives 6. Ministry of Transport 7. Ministry of Natural Resources and Environment 8. Ministry of Energy 9. Ministry of Commerce 10. Ministry of Interior 11. Ministry of Science and Technology 12. Ministry of Education 13. Ministry of Public Health 14. Ministry of Industry 15. Office of the National Security Council 16. Office of The National Research Council of Thailand 17. Thailand Research Fund 18. Agricultural Research Development Agency (Public Organization) 19. Bank for Agriculture and Agricultural Cooperatives 20. The Thai Chamber of Commerce 21. The Federation of Thai Industries

Strategy	Organization
Strategic Theme 2 Food Quality and Food Safety	1. Ministry of Finance 2. Ministry of Foreign Affairs 3. Ministry of Agriculture and Cooperatives 4. Ministry of Commerce 5. Ministry of Interior 6. Ministry of Culture 7. Ministry of Science and Technology 8. Ministry of Public Health 9. Ministry of Industry 10. Office of the Consumer Protection Board 11. Office of The National Research Council of Thailand 12. National Health Commission of Thailand 13. The Thai Chamber of Commerce 14. The Federation of Thai Industries
Strategic Theme 3 Food Education	1. Ministry of Agriculture and Cooperatives 2. Ministry of Interior 3. Ministry of Science and Technology 4. Ministry of Education 5. Ministry of Public Health 6. Office of The National Research Council of Thailand 7. Office of the Consumer Protection Board 8. National Health Commission of Thailand 9. Thailand Research Fund 10. Thai Health Promotion Foundation 11. Agricultural Research Development Agency (Public Organization)

Strategy	Organization
Strategic Theme 4 Food Management	1. Ministry of Agriculture and Cooperatives 2. Ministry of Commerce 3. Ministry of Interior 4. Ministry of Education 5. Ministry of Public Health 6. Ministry of Industry 7. Office of the Council of State 8. Office of The National Research Council of Thailand 9. Office of The Civil Service Committee 10. Office of the Public Sector Development Committee 11. Bureau of Budget 12. Thailand Research Fund 13. Every organization with related law

Note : Agencies and organizations mentioned above are subject to change according to appropriateness

Appendix

National Food Committee Act 2008

BHUMIBOL ADULYADEJ, REX

Given on the 31st day of January B.E. 2551

Being the 63rd year of the Present Reign

By Royal Command of His Majesty King Bhumibol Adulyadej, it is necessary to enact a National Food Committee Act.

This Act contains provisions relating to the legal restriction of the rights and liberties of citizens as prescribed in Sections 29, 41 and 43 of the Constitution of the Kingdom of Thailand.

His Majesty, therefore, granted His Royal consent to enact a National Food Committee Act in accordance with the recommendations and consent of the National Legislative Assembly. This Act contains the following provisions.

Section 1. This Act shall be called the "National Food Committee Act B.E. 2551 (2008)"

Section 2. This Act shall come into force on and from the day following its publication in the Government Gazette.

Section 3. The terms and definitions in this Act are as follows.

"Food" means edible items as stated in the Food Law.

"Food Chain" refers to the food production cycle, which covers raw materials, production, cultivation, culture, cutting, harvesting, processing, transporting, cooking, assembly, packaging, storage, trade and the distribution of foods to consumers, including food import, transit and export.

"Food Quality" means food that has appropriate physical properties, composition and nutritional value.

"Food Safety" means the management process required to make food and agricultural products safe for consumption and without contamination, according to the Food Law and other relevant laws. Food products deemed unsafe are those that have the following characteristics:

(1) Foods containing pathogenic microorganisms or harmful material contamination.

(2) Foods contaminated with chemical substances at harmful levels, as deemed by relevant laws, including those substances that may accumulate in the body, cause illness or lead to a deterioration in health.

(3) Foods produced through unsanitary production methods, cooking, packaging, transport or storage practices.

(4) Foods obtained from unhealthy animals or animal parts containing zoonotic diseases.

(5) Foods produced, cooked or assembled from animals and plants, or their parts, that contain harmful levels of hazardous chemical substances, medicines or antibiotic residue.

(6) Foods packed in containers made from materials hazardous to human health.

"Food Security" means that each citizen has access to an adequate supply of food that is safe and is nutritionally suitable for all ages. Food security also means that food supplies have suitable, balanced production cycles that are appropriate for the ecosystem and the natural resources needed for national food production under normal circumstances, as well as during natural disasters or terrorist attacks related to food.

"Food education" means researching, developing and promoting appropriate knowledge, awareness and behaviors associated with the food production chain and food consumption.

"Committee" means the National Food Committee.

Section 4. The National Food Committee shall be composed of the following persons and their positions.

(1) The Prime Minister, or Deputy Prime Minister assigned by the Prime Minister, will serve as the Committee Chairperson.

(2) The Committee will include the following members: Minister of Defense, Minister of Finance, Minister of Foreign Affairs, Minister of Social Development and Human Security of Thailand, Minister of Agriculture and Cooperatives, Minister of Commerce, Minister of Interior, Minister of Science and Technology, Minister of Education, Minister of Public Health, Minister of Industry, Secretariat of the National Economic and Social Development Board, Secretariat of the National Security Council, Secretariat of the Consumer Protection Board and Secretariat of the National Health Committee.

(3) The Cabinet will appoint seven well-known and knowledgeable experts on food quality, food safety, food security, food education, law and other related issues. These experts will have over 10 years experience in their respective fields.

(4) The Secretariat of the Food and Drug Administration will serve as Assistant Secretary of the Committee. The Director of the National Bureau of Agricultural Commodity and Food Standards will serve on the Committee as Joint-Secretary.

One officer from the Ministry of Public Health, appointed by the Permanent-Secretary of the Ministry of Public Health, as well as one officer from the Ministry of Agriculture and Cooperatives, appointed by the Permanent-Secretary of the Ministry of Agriculture and Cooperatives, will serve as Assistant Secretaries.

Section 5. Committee members noted in Section 4 (3) shall possess adequate qualifications and shall have the following characteristics:

(1) possess Thai nationality;

(2) not less than forty years of age;

(3) not a political official, political position holder, councilor, local governmental official, committee member or administrator of a political party or officer of a political party;

(4) not incompetent or a quasi-incompetent person;

(5) not declared bankrupt or participated in bankruptcy fraud;

(6) not been imprisoned by a final court judgment or is awaiting the serving of a sentence, except for offences concerning negligence or petty offences;

Section 6. Committee members noted in Section 4 (3) shall hold their positions for one four-year term, starting from the date of appointment; they shall not hold their positions for more than two consecutive terms.

Upon the expiry of a Committee member's term, if a new Committee member in Section 4 (3) has not been appointed, the retiring Committee member shall remain in position until a new member has assumed the position, but not for longer than 90 days since expiry of the out-going Committee member's term.

If a Committee member vacates his/her position before his/her term expires, a new appointment shall be made within 90 days of the vacancy. The new Committee member shall hold his/her position for a term equal to the remainder of the term of the vacated position.

If the term of vacancy is less than 90 days, a new appointment may not be made, and the remaining Committee members shall continue the Committee's duties.

Section 7. Apart from a term's expiry, a qualified member of the Committee shall vacate his/her position upon:

(1) death;

(2) resignation;

(3) dismissal by the Minister;

(4) not possessing adequate qualifications or those characteristics prescribed in Section 5.

Section 8. Committee meetings shall be attended by not less than half of the total number of Committee members in order to form a quorum.

If the Committee's Chairperson does not attend the meeting, or the Chairperson is unable to perform his/her duty, the Committee members present at the meeting shall elect one member to serve as Acting Chairperson for that meeting.

Committee decisions will be made by majority vote. Each member shall have one vote. In the case of a tie, the Chairperson of the meeting shall have an additional casting vote.

There shall be not less than two Commission meetings per year.

Section 9. The Committee shall be empowered to appoint an Ad hoc Committee or one or more Sub-Committees to conduct any tasks as assigned by the Committee.

The Ad hoc Committee shall be empowered to appoint a Sub-Committee or working group to conduct any tasks as assigned by the Ad hoc Committee.

The provisions under Section 8 above shall also apply to meetings of the Ad hoc Committee or Sub-committee mutatis mutandis.

Section 10. The Committee shall have the following powers and duties.

(1) Authority to propose food quality, food safety, food security and food education policies and strategies, including emergency plans and a food alert system, to the Cabinet for approval and assignment of responsible agencies.

(2) Create or promote the development of policies and strategies on food quality, food safety, food security and food education in an ongoing manner and with the participation of all involved sectors.

(3) Provide advice on the Declaration according to Section 12.

(4) Provide opinions and recommendations to other organizations in order to resolve issues related to food quality, food safety, food security and food education.

(5) Control, monitor and evaluate the outcomes of policies and strategies prescribed in (1) above, and to administrate, to solve problems and to report to the Cabinet on operational issues according to the laws or regulations of respective government organizations concerned with food quality, food safety, food security and food education.

(6) Implement other actions as prescribed in this Act, other laws or those assigned by the Prime Minister or Cabinet.

Section 11. To conduct the duties prescribed in Section 10, the Committee shall have the power to request Ministries, Bureaus, Departments, Local Governmental Organizations, State Enterprises, Juristic Persons or any person to provide academic, statistical, management or other information assistance related to creating food quality, food safety, food security and food education policies and strategies. The Committee also shall have the power to issue a written order summoning any person to give facts, statements or opinions for consideration, as necessary.

Section 12. During serious and emergency situations including disasters, public endangerment or terrorist activities related to food, the Prime Minister, with recommendations from the Committee and the consent of the Cabinet, shall have the power to declare any given area as a temporally restricted area for food security purposes, as well as the power to

specify regulations, procedures and conditions on utilizing that area. The Declaration will contain a map of the restricted area.

The Declaration shall be undertaken as necessary to achieve specific objectives, but with the least amount of adverse impact to the owner, tenant or user(s) of that area.

The Declaration shall be in force for not more than one year after the date of its enactment, and it shall be extended for not more than one year at a time in cases where serious and emergency threats persist. The Declaration shall be posted at the following locations.

(1) Office of the organization prescribed in Section 15 paragraph 3.

(2) The Bangkok Metropolitan Administration, District Office, Branch District Office, City Hall, Office of the Sub-district Headman, Office of the Village Headman where the declared restricted area is located, whichever the case may be.

(3) The Bangkok Metropolitan Land Office and Bangkok Metropolitan Land Branch Office or the Provincial Land Office and Provincial Land Branch Office and the District Land office where the declared restricted area is located, whichever the case may be.

Section 13. In a restricted area as described in Section 12, all persons are prohibited from utilizing the area or conducting any activities in the area that violate the regulations, procedures and conditions prescribed in the Declaration.

Section 14. Whoever violates Section 13 shall be punished by imprisonment for not more than two years or a fine of not more than forty thousand baht, or both.

Section 15. Within a period of ninety days from the date of this Act's enforcement, the Committee prescribed in Section 4 (4) shall choose candidates who possess suitable qualifications and shall not possess the prohibited characteristics as prescribed in Section 5. In order to become Committee members as prescribed in Section 4 (3), candidates will be well-known, knowledgeable and have over 10 years experience in the areas of food quality, food safety, food security, food education, law or other related fields. The candidate list shall have twice the number of persons to the number of Committee member positions as prescribed in Section 4 (3). The Committee Chairperson will submit the candidate list to the Cabinet for selection and appointment to the Committee as prescribed in Section 4 (3) afterward.

The provisions in the first paragraph shall apply in cases when terms expire as noted in Section 4 (3) or become vacant before term expiration mutatis mutandis.

When the Committee Secretary is absent, the Food and Drug Administration or another organization assigned by the Cabinet shall act as Secretary to the Committee, Ad hoc Committee, Sub-Committee and working group until the Secretary is available.

Section 16. The Prime Minister shall be in charge of and control this Act and shall have the power to prescribe ministerial orders and notifications for the purposes of enforcing the provisions of this Act.

Ministerial orders and notifications shall come into force upon their publication in the Government Gazette.

Countersigned by General Surayud Chulanontas as Prime Minister

NOTE :

The reason for this Act's promulgation is that currently many food related laws exist that involve many organizations in Ministries, Bureaus and Departments. However, there are differences in their duties under a limited framework. In addition, there is also a lack of integration, unity and the effective control of food chain operations, including food quality and safety for consumer protection, as well as promoting and supporting food training and food industries at national and international levels. There is also a lack of food security policies and strategies during normal times and emergencies, as well as a lack of protection measures against terrorist activities involving food. A need also exists for food education that is responsive to the changing global situation. Hence, a law is required to establish a National Food Committee as the main agency and important mechanism for specifying policies and strategies on every aspect of food and the food chain in a unified and efficient manner and for integrating involved organizations. This Act, therefore, has been established.

Notifications of the Office of the Prime Minister

Subject: National Food Committee appointment

The National Food Committee Act 2008 legislates that the Cabinet is empowered to appoint appropriate, competent experts who have over 10 years experience in food quality, food safety, food security, food education, law or other relevant fields to be members of at least one Committee in each category and to act as members of the National Food Committee for a total of seven committees.

Thereby, under the authority given in Section 4 (3) of the National Food Committee Act 2008, a Cabinet Resolution was announced on 20 May 2008 appointing seven experts as members of the National Food Committee as follows:

1. Professor Emeritus Dr. Kraisid Tontisirin
2. Mr. Dhanin Chearavanont
3. Mr. Poj Jirawuttikul
4. Mr. Suraporn Vongvadhanaroj
5. M.L. Anothai Chumsai
6. Assistant Professor Thanavath Phonvichai
7. Professor Sakarindr Bhumiratana

The appointment will be effective starting 20 May 2008.

Announced on 30th May 2008
Surapong Suebwonglee
Deputy Prime Minister,
For Prime Minister

Decision of the National Food Committee

1/2010

Subject: Strategic Framework for Food Management in Thailand Committee Appointment

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At the National Food Committee meeting 1/2009 held on 20 August 2009, the Committee appointed a committee to collect and evaluate information to create a Strategic Framework for Food Management in Thailand. Committee members also gave their opinions and suggestions to the National Food Committee according to the objectives of National Food Committee Act 2008.

Following the authority given under Section 9 of National Food Committee Act 2008, the National Food Committee appointed members of the Strategic Framework for Food Management in Thailand Committee as follows:

1. Professor Emeritus Dr. Kraisid Tontisirin — Committee Chairman
   National Food Committee Expert
2. Ms. Metanee Sukontarak — Committee Vice-Chairman
   Senior Advisor of National Bureau of Agricultural Commodity and Food Standards
3. National Economic and Social Development Board Representative — Committee
4. Office of Agricultural Economics Representative — Committee
5. Associate Professor Chancharat Reodecha — Committee
   Agricultural Director of Thailand Research Fund
6. Associate Professor Pornkamol Traiwittayanggoon — Committee
   Faculty of Economics, Chulalongkorn University
7. Assistant Professor June Charoenseang — Committee
   Faculty of Economics, Chulalongkorn University
8. Experts whom Strategic Framework for Food Management in Thailand Committee Chairman temporary appoint periodically, not more than 5 persons — Committee

9. Ms. Tipvon Parinyasiri — Committee and Secretary
   Director of Food Control Division,
   Food and Drug Administration
10. Ms. Doojduan Sasanavin — Committee and Joint-Secretary
   Director, Division of Agricultural
   Commodity and Food Standards Policy
   National Bureau of Agricultural Commodity
   and Food Standards
11. Ms. Pachanee Intoraruck — Committee and Assistant Secretary
   Food Control Division,
   Food and Drug Administration
12. Ms. Ingorn Punyakij — Committee and Assistant Secretary
   Academic Specialist Officer
   Office of Commodity and System Standards
   National Bureau of Agricultural Commodity
   and Food Standards

Responsibilities

1. Create a Strategic Framework for Food Management in Thailand, covering Food Security, Food Quality, Food Safety and Food Education, and submit this Framework to the National Food Committee for approval.

2. Appoint a subcommittee or working group to carry out tasks assigned by the committee or any other appropriate tasks.

3. Undertake any relevant task assigned by the National Food Committee.

This authorization shall be in effect henceforward.

Announced on 22nd February 2010

Major General Sanan Kajornprasart
Deputy Prime Minister
Chairman of the National Food Committee

Representatives of Agencies on the Strategic Framework for Food Management in Thailand Committee

Office of the National Economic and Social Development Board

1.	Mrs. Suwanee Khamman Deputy Secretary General of National Economic and Social Development Board	Representative
2.	Ms. Ladawan Kumpa Advisor for Policy and Planning (Senior Policy and Plan Analyst)	Alternate Representative

Office of Agricultural Economics, Ministry of Agriculture and Cooperatives

1.	Mrs. Nareerat Runaphai Deputy Secretary General of Office of Agricultural Economics	Representative
2.	Mrs. Korntip Seneewong Na Ayudhaya Director of Bureau of International Agricultural Economics	Alternate Representative

Experts Appointed to be a Joint Committee by the Chairman of the Strategic Framework for Food Management in Thailand Committee

1.	Ms. Chutima Bunyapraphasara	Inspector General, Ministry of Commerce
2.	Asst. Prof. Dr. Charuk Singhaprecha	Deputy Dean for Academic and International Affairs, Faculty of Economics, Kasetsart University
3.	Assoc. Prof. Dr. Chayodom Sabhasri	Lecturer, Faculty of Economics, Chulalongkorn University

List of Agencies Providing Data Support for the Strategic Framework for Food Management in Thailand

The Thailand Research Fund (TRF)

1. Assoc. Prof. Prapaporn Khopaiboon

Food and drug administration

2.	Mrs. Treerat Rungrotchaiporn	Food and Drug Officer, Senior Professional Level
3.	Ms. Orasa Chongworagun	Food and Drug Officer, Professional Level
4.	Mr. Sayan Ruadrew	Food and Drug Officer, Practitioner Level
5.	Mr. Amornpan Lukin	Food and Drug Officer, Practitioner Level
6.	Mr. Worapoj Ritdee	Food and Drug Officer, Practitioner Level
7.	Ms. Waliga Sanongkhun	Food and Drug Officer, Practitioner Level
8.	Ms. Pattarawan Wattanasap	Food and Drug Officer, Practitioner Level
9.	Mrs. Thida Thaveerit	Food and Drug Officer, Practitioner Level
10.	Ms. Jarunee Wonglek	Food and Drug Officer, Practitioner Level
11.	Ms. Manasuwee Phaichamnan	Food and Drug Officer, Practitioner Level
12.	Ms. Chaninun Limpichutchawan	Food and Drug Officer, Practitioner Level
13.	Ms. Jurairat Tanomkit	Food Scientist

National Bureau of Agricultural Commodity and Food Standards (ACFS)

14.	Mrs. Siraprapa Sripromunee	Plan and Policy Analyst, Professional Level

Secretary of the Strategic Framework for Food Management in Thailand

1. Ministry of Agriculture and Cooperatives
   - Department of Agricultural
   - Office of Agricultural Economic
2. Ministry of Information and communication technology
   - National Statistical Office
3. Ministry of Energy
4. Ministry of Commerce
   - Thailand Customs Department
5. Ministry of Public Health
   - Department of Health
   - Food and Drug Administration
   - Bureau of Epidemiology
6. Ministry of Industry
   - National Food Institute
7. Knowledge Network Institute of Thailand
8. Thailand Development Research Institute
9. Thai Health Promotion Foundation
10. The Prime Minister's Office
    - The Thailand Research Fund
    - Office of the National Economic and Social Development Board

Summary of Comments from Government Agencies on the Strategic Framework for Food Management in Thailand

1. Ministry of Foreign Affairs

- Agree with the Strategic Framework that covers important issues of food management in Thailand.
- An urgent issue is to follow-up with all involved organizations so that their plans are integrated and they are working in the same direction under the Strategic Framework, including planning and budgeting.
- For food education, the Strategic Framework should also focus on biotechnology research and greenhouse gas emissions from the agricultural sector.
- Investment for agriculture and food products should be an integral part of food production, trade and the promotion of the agricultural sector through the Responsible Agricultural Investment (RAI) initiative proposed by the United Nations Conference on Trade and Development (UNCTAD), the Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD) and The World Bank. Recently, the RAI principle was accepted at the 1st APEC Ministerial Meeting on Food Security held at Niigata, Japan, and was included in The Niigata Declaration on APEC Food Security.
- This Framework should be integrated with other strategies and strategic frameworks, such as the Master Plan for the Food Industry, the Agricultural Commodity and Food Standards Strategy, the Strategic Plan for Organic Agricultural Development, and the Strategy for Halal Product Business Promotion and Development, in order to reduce redundancy and to ensure the efficient use of budgetary funds.

2. Ministry of Tourism & Sports

- Agree with the Strategic Framework. It is important for effective, systematic and up-to-date food management during normal times and emergency situations.
- The Framework should promote local community participation in order to strengthen production capabilities, as well as to facilitate the modification of primary products into high value products. Efforts should be made to promote local agricultural tourism through local agriculture and food culture activities, which will be benefit the development of agricultural tourism in Thailand.

3. Ministry of Energy

- Agree with the Strategic Framework. The Ministry of Energy will play a responsible role in Strategies 1 and 3 through three operational guidelines, namely:
  1) Specify a clear economic policy on the promotion of alternative energy from crops in order to prevent threats to crops that are used for food production, which can affect national food security.
  2) Implement zoning for energy crops and food crops.
  3) Focus on using crops with low costs or crops for export to produce energy.

4. Ministry of Science and Technology

- Agree with the Strategic Framework. The Ministry of Science and Technology has operational plans and projects to support the Framework, such as the project on Sustainable Community Water Management to Prevent Drought and Flood Outside Irrigation Areas conducted in fiscal year 2011 by the Hydro and Agro Informatics Institute and which operated in 84 communities.
- Concerning food quality and food safety, these issues should address toxic chemicals that are released from food containers, such as Bisphenol A (BPA) from baby milk bottles.
- Strategic Theme 1: Food security, Strategy 10. Additional initiatives are needed to improve organizational capabilities in the collection and preservation of genetic materials from plants and animals (natural or derived from research); for example, initiatives to improve the safety of storage locations and equipment, as well as the creation of integrated and modern storage systems. Staff members must have adequate knowledge to guarantee the availability and preservation of valuable genetic materials during times of emergency.
- Strategic Theme 2: Food Quality and Food Safety. A strategy is needed on developing safety standards for food containers and other materials that come into contact with food.
- The private sector should take part in research and development under a guideline provided by the government on the direction of research and prioritize research topics. There should be strong cooperation in terms of investment between the government and private sectors.

- A suitable educational institute should take part in training and academic activities.
- Discussion is needed about the Strategic Framework's application and the commitment that all involved organizations must make and follow.

5. Office of the National Security Council

- The Strategic Framework should focus on planning and on integrating the operations of the national government, local governmental organizations, as well as private and public sectors.
- The Strategic Framework should state that the Ministry of Agriculture and Cooperatives is the main agency at the ministerial level responsible for disaster prevention and mitigation in order to integrate the operations of all involved agencies.
- The Strategic Framework should discuss Thailand's National Food Reserve Bank and the transportation system to deliver food to victims of disaster.
- The Strategic Framework should support officers to function effectively in emergency situations through the cooperation and integration of all involved organizations in the Disaster Prevention and Mitigation Operational Plan at the ministerial level.
- The Strategic Framework should focus on creating and keeping an up-to-date food resource database. Information should be easily exchanged among involved organizations.
- The Strategic Framework should focus on creating a database of disaster information from the Department of Disaster Prevention and Mitigation.

6. Office of the National Economics and Social Development Board

- The Strategic Framework should focus on balancing food security by giving equal importance to natural and environmental conservation, increasing the performance of production and marketing, improving standards and the value added aspects of agricultural and food products, improving careers and income security, and creating food security in agricultural households in the country.
- All involved organizations should participate in creating an operational plan that can systemically link together each of their operations. Indicators must be identified to evaluate the Strategic Framework and the achievements of all involved organizations according to the goal and objectives of the Strategic Framework.

7. Office of the Council of State

- The Strategic Framework should take into consideration the policy on land, natural resources and environment in section 85 (2) of the Constitution of the Kingdom of Thailand BE 2550 that states that land tenure distribution should be justified for agriculturalists to improve their agricultural activities through land reform or other measures, as well as to provide adequate water resources for agriculture. The Strategic Framework should take into account related laws on this issue.

8. Thai Health Promotion Foundation

- Agree with the Strategic Framework

9. Bureau of Budget

- The Strategic Framework should identify a main organization to develop a specific operational plan. This plan should include a goal and priorities that are appropriate for the mission and responsibilities of each involved organization in terms of their potential and readiness. This plan should also state a timeframe in order to effectively prepare budgets and operational plans.

10. Office of The National Research Council of Thailand

- Agree with the Strategic Framework in terms of research in Strategic Theme 1: Food Security for Strategy 9 and Strategic Theme 3: Food Education for Strategy 2. These are in accordance with the 2nd strategy and research plan on Creating Potential and Performance for Economic Development contained in the draft of the 8th National Research Policy and Strategies (2012-2016) created by the Office of The National Research Council of Thailand and being considered by the Cabinet.
- The Strategic Framework is consistent with Research Policy and Strategies (2012-2016) at the regional level for all four regions of Thailand.

11. Ministry of Social Development and Human Security of Thailand

- Agree with the Strategic Framework

12. Ministry of Transport

- Agree with the Strategic Framework
- Ministry of Transport should be directly involved in Strategic Theme 1: Food Security for Strategy 7 "Develop and improve logistic systems for agricultural and food products." A system for collecting and distributing agricultural products is needed, as well as its connection to land, water, rail and aerial transportation systems. The Strategic Framework should also support and promote technology and innovative research in order to increase the efficiency of logistic systems.

13. Ministry of Interior

- The Strategic Framework is appropriate and necessary for local governmental organizations. However, the readiness of each local governmental organization in terms of personnel, budget, knowledge and technologies must be taken into consideration.
- More initiatives are needed in Strategic Theme 1: Food Security for Strategy 8 to strengthen the role of the public sector and community organizations in promoting public participation.
- More initiatives are needed in Strategic Theme 2: Food quality and safety for Strategy 6, by strengthening the consumer network in order to monitor food quality. A complaint management system should be created to thoroughly solve problems facing consumers.

14. Ministry of Public Health

- The Strategic Framework can promote the integration of organizational operations. It can serve as a guideline for involved organizations to improve their operational effectiveness and reach achievements within a specified timeframe.

15. Ministry of Education

- The Strategic Framework should support training and develop human resources to understand and use food knowledge for community development.
- The Strategic Framework should encourage agriculturists and educational institutions to cooperate, exchange and transfer food education knowledge along with food culture.
- The Strategic Framework should encourage local communities and educational institutions to create food education courses that are suitable for local communities.

16. Ministry of Industry

- The Strategic Framework is in accordance with the Master Plan of the Food Industry 2010-2014 of the Ministry of Industry.
- The Office of the National Economic and Social Development Board should add the Strategic Framework into the 11th National Economic and Social Development Plan. It should encourage all involved organizations to use it as a framework for their operational plans and report the results back to the National Food Committee.

Notes

From the Cabinet Resolution Circular Notice of The Secretariat of the Cabinet, urgent category “At NorRor 0506/Wor(Lor) 19910” dated 29 October 2010, there were additional comments from six other agencies, namely: 1. Ministry of Social Development and Human Security of Thailand, 2. Ministry of Transport, 3. Ministry of Interior, 4. Ministry of Public Health, 5. Ministry of Education and 6. Ministry of Industry.

Strategic Framework for Food Management in Thailand

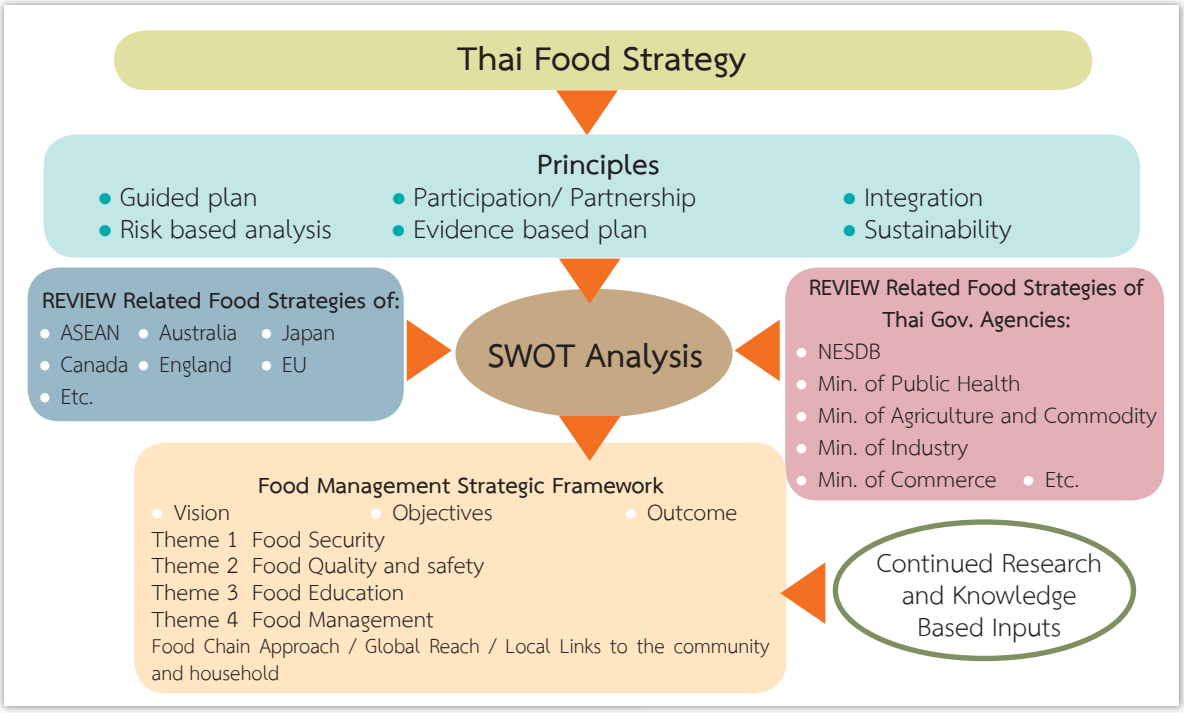

Figure 1 Strategic Framework for Food Management in Thailand

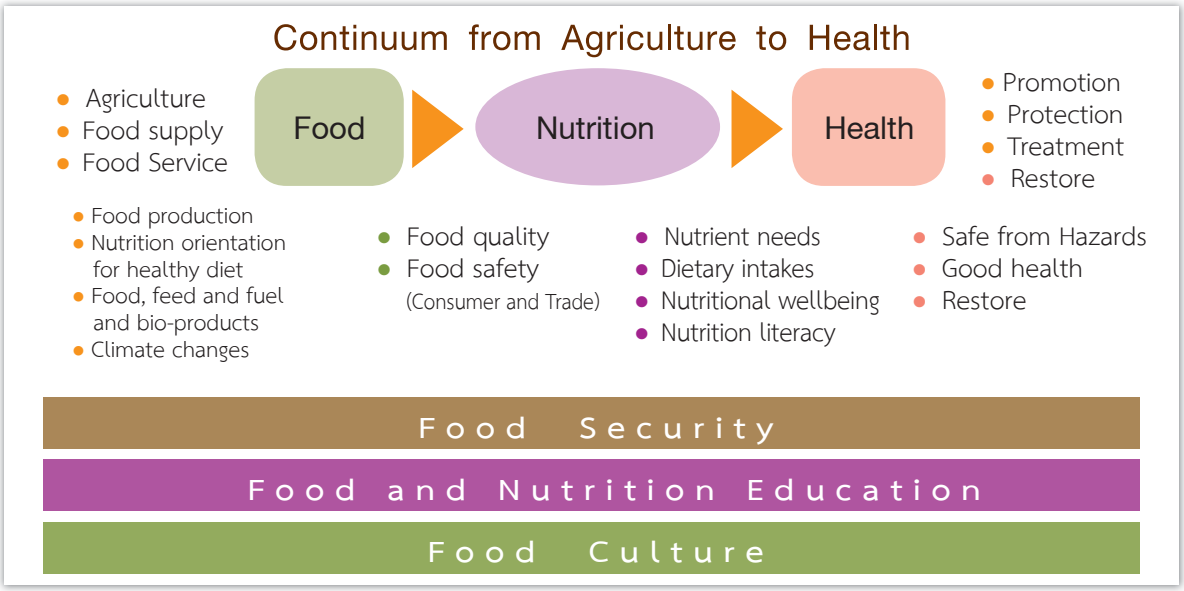

Figure 2 Continuum from Agriculture to Health

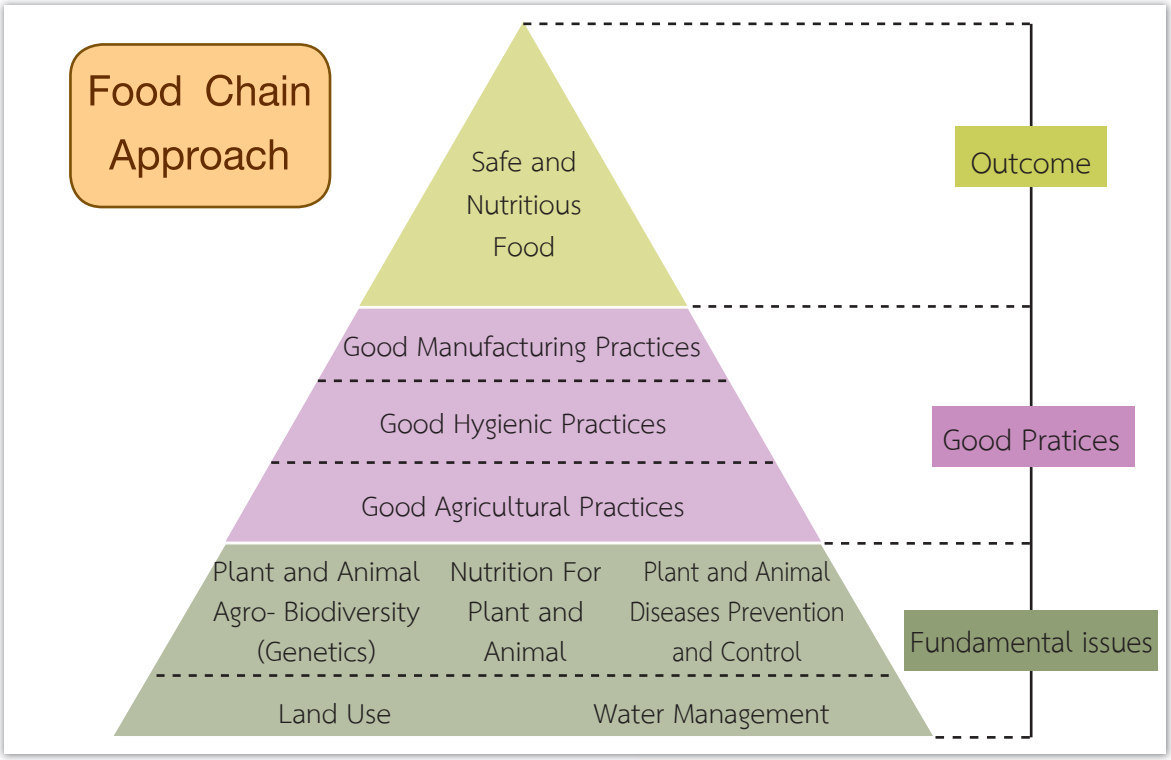

Figure 3 Food Chain Approach

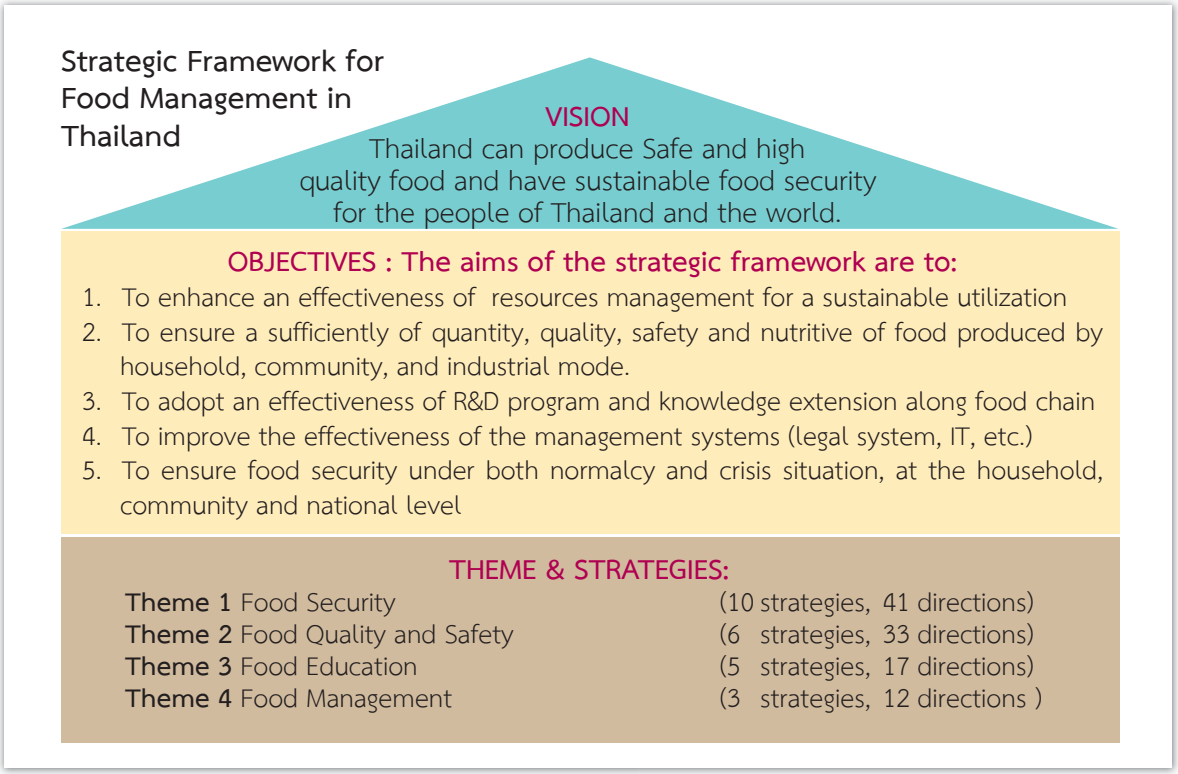

Figure 4 Strategic Framework for Food Management in Thailand

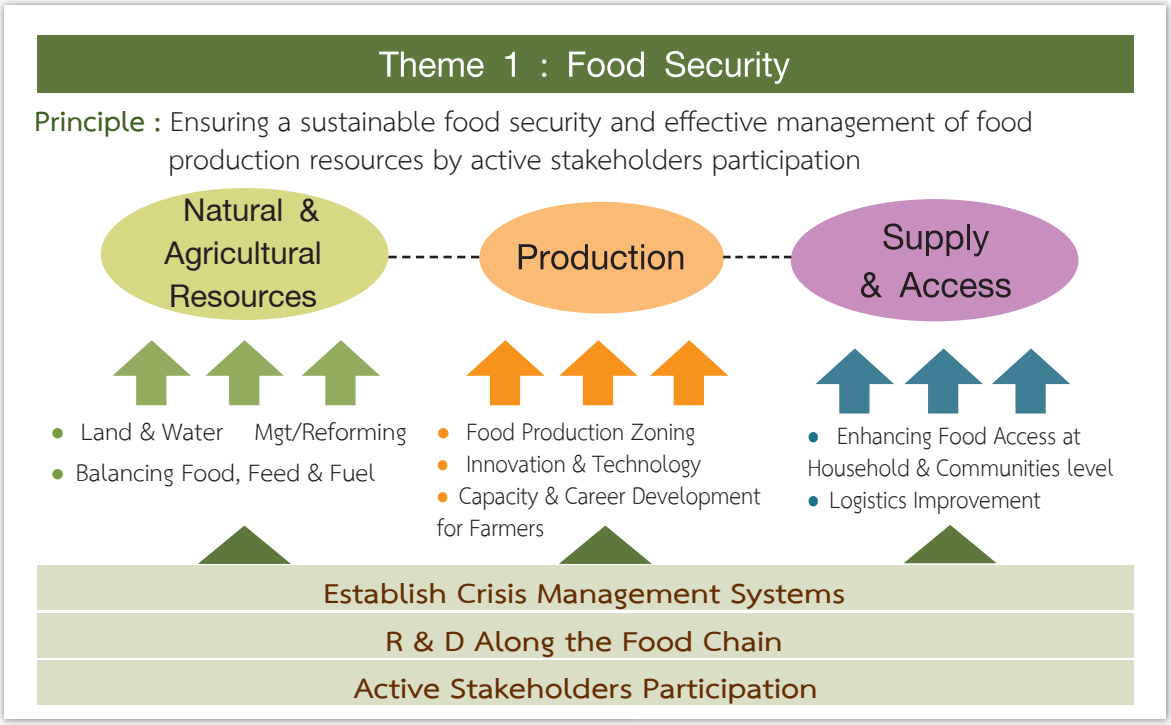

Figure 5 Theme 1 : Food Security

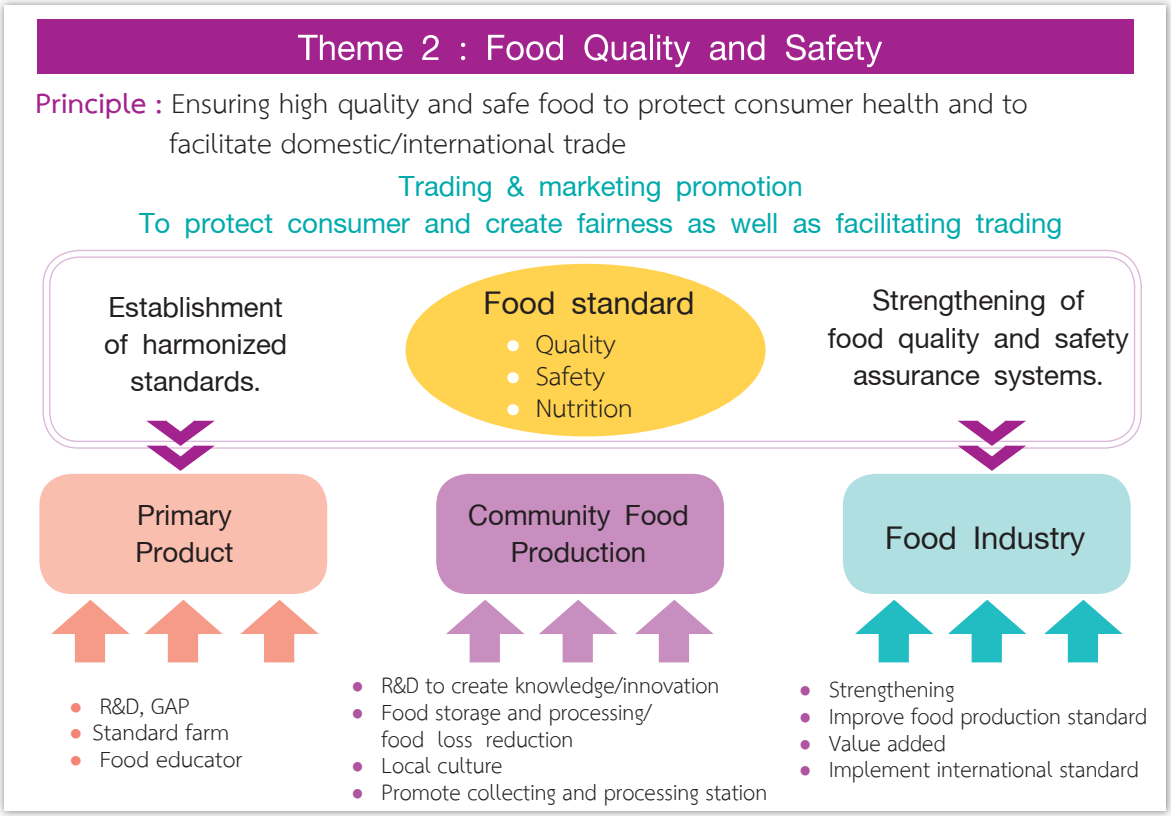

Figure 6 Theme 2 : Food Quality and Safety

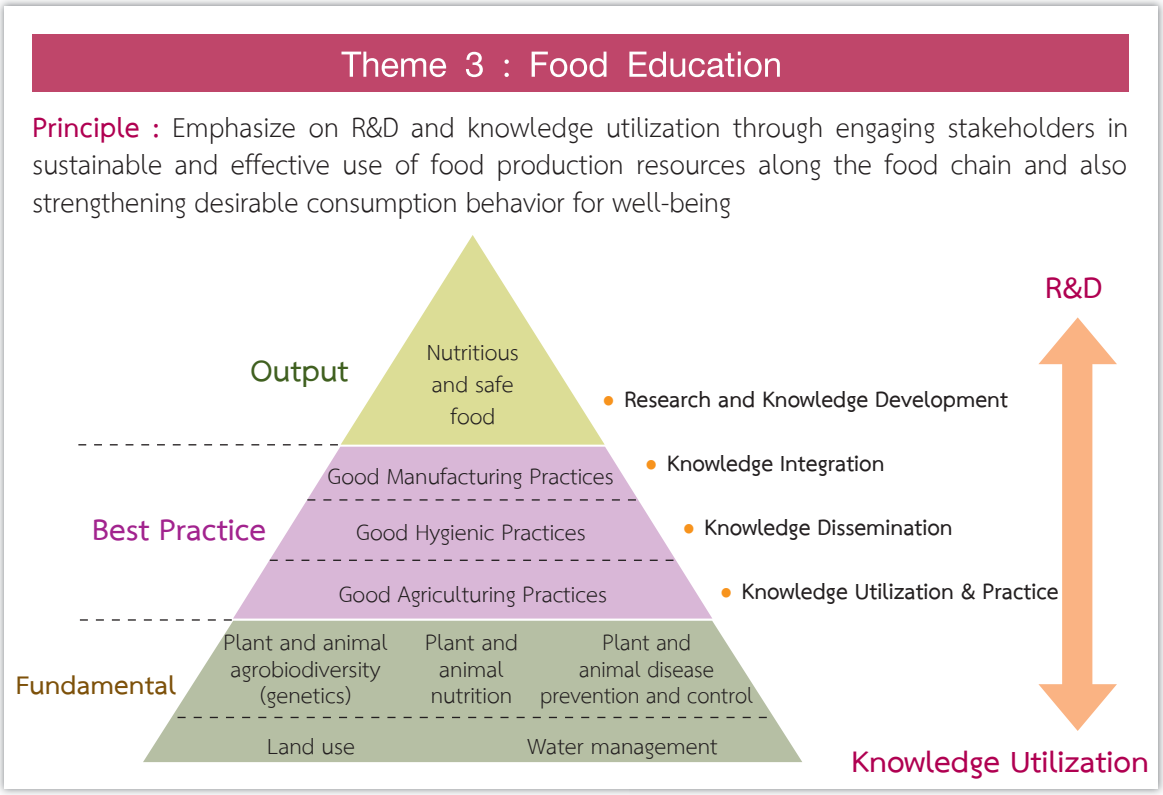

Figure 7 Theme 3 : Food Education

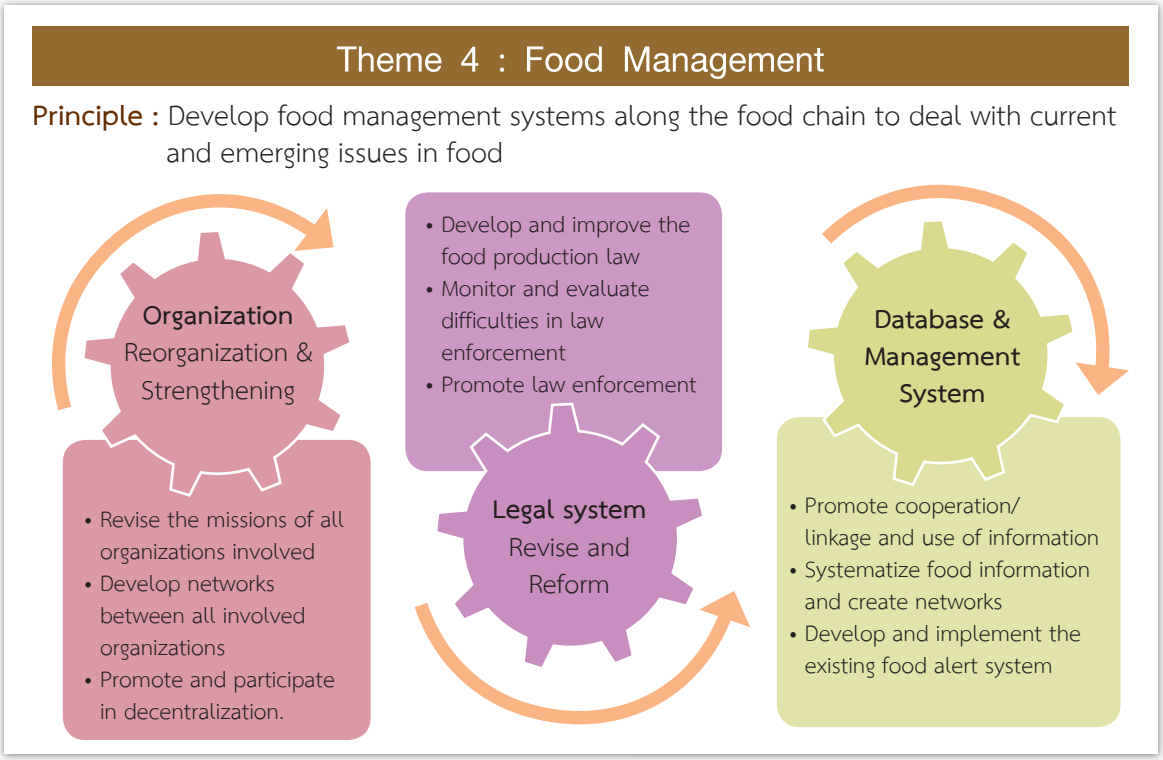

Figure 8 Theme 4 : Food Management

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