

Food Security Systems in Indonesia: Challenges and Implications to Food Security in Maluku

GIRSANG Wardis

Faculty of Agriculture, Pattimura University

Abstract

National food security policy is actually preceded by food self-sufficiency at national level which is focused on rice, corn, soybean, and meat. In fact, the priority target is more focused on rice self-sufficiency to produce as much as of 10 million tons of rice surplus or equals to 75.7 million tons in 2015. This target is achieved by integrating national food security systems. Because Java has complex problems of rice production, particularly in line with agricultural land conversion to non-farm activities, climate change, and small scale farm, therefore all provinces are asked by the central government to support and make the program of rice self-sufficiency as a main indicator to food security. Even though Maluku has 4.6 million ha of agricultural land but only of 20,000 ha of the land is cultivated by wet land rice that produced around 80,000 tons of rice or 50% of total rice demand in Maluku Province. This implies that rice self-sufficiency is very difficult to achieve because it needs three folds of rice land area and this is probably not suitable to apply in Maluku. Expansion of the wet land rice should be discontinued but intensification should be continued on the existing rice field. On the contrary, the area of agricultural land that suitable to dry land food crops is accounted around of 718,466 ha. Location specific, optimalization, clustering, regulation, and expansion of the area of dry land food crops, particularly for up land rice, sago palm, cassava, sweet potato, breadfruit, and corn, should be made as a main indicator of non-rice food self-sufficiency, food security, and nutrition security development in Maluku.

Keywords: food security policy, Maluku, non-rice food self-sufficiency, rice food self-sufficiency

Introduction

Indonesia is known as an archipelago region that has abundance of agricultural, fishery, and marine resources. Besides, Indonesia has also human resource potential that reached up to 237.6 million in 2010. Population growth cannot be avoided and will influence the higher need of food demand, particularly the source of carbohydrate such as rice and flour and the source of protein like meat and fish, including fruits, vegetable, and clean water. At this condition, how does Indonesian government achieve rice-self-sufficiency and provide enough

food for all population that tend to grow faster (1.4%/year) than the growth of food crop (1%/year)?

The answer to the question is to maintain suitable land for food/rice crop in Java. Why? Because land of food crops in Java is more fertile than food crop land in out of Java, irrigation water dam is more established. Therefore, the central production of rice, soybean, and corn is more suitable and relevant to develop in Java. In fact, Java faces a serious challenge in terms of agricultural land conversion into non-farm activities such as resettlement, real estate, road, building offices, and industry development. At the same time, the area of food crop (rice) in Indonesia decreased around 100,000 ha/year (SUSWONO 2012), rice productivity is relatively stagnant and the size of farm per household or land fragmentation tends to become smaller in the last decade. These issues and the challenge to climate change and global warming impact on food production are the main constraints to sustain rice base staple food to all population in Indonesia.

Rice Bias Policy

Rice crop was developed by the Dutch as the part of ethical politics during the colonization in the 1905. Then, Indonesian government continued to expand rice land outside of Java through transmigration program in Sumatra, Kalimantan, Sulawesi, Papua, and Maluku. In the 1960s and 1970s, Indonesia developed green revolution to imboost rice production through extensification and intensification of the rice crops. At this stage, the government introduced mass guidance in the 1960s, special intensification in the 1970s and then supra-special intensification in the 1980s. These government programs provided input production such as seeds, pesticides, herbicides, fertilizers subsidy as well as irrigation water dam infrastructure, village unit cooperatives, and agricultural extension agents. As a result, Indonesia achieved rice self-sufficiency in 1984.

Besides, the central government also determines the price of rice in terms of floor price and ceiling price of rice. To maintain the buffer stock, the government developed Logistic Business Board to keep national stocks of rice, flour, and sugar. Rice is strategic commodity because it is crucial food and crop in Indonesia and in the other Asian countries. As staple food, rice is the main source of carbohydrate and protein to most people in Indonesia, absorb most of rural labors and contribute to the gross domestic product. However, all these government interventions might be successes to achieve production in the short term but it failed to address farmer's household income significantly because 75% of the poor people in Indonesia are categorized as food crop farmers.

Rice is pivotal commodity because rice influence inflation and if rice price increase by 10% thus it will increase of around 1.3% of the number of poor people. Due to the small size

of farm and low level of production per household, it can be argued that 70% of rural households are net rice consumers. To fulfill the national rice consumption/demand that increased considerably (around 130 kg/capita/year), the government policy is to increase rice production, to reduce rice consumption by 1.5%/year, to accelerate food diversification consumption and/or to support rice import policy.

Food Crops in Indonesia: Potential and Productivity

The main food crops in Indonesia were rice, corn, and soybean. In the last 5 years, the central government made all these food crops as the top target priorities. The government targeted the growth of 3.2%, 10%, and 20.1% for rice, corn, and soybean, respectively. In order to achieve food self-sufficiency and dependency on rice import, President of Indonesia instructed to achieve 10 million tons of rice surplus (SUSWONO 2011). At this stage, the top target of rice production is 76 million tons of milling dry paddy. In fact, this target is still difficult to achieve in 2014 (Table 1).

The average rice productivity in the last decade is of 4.35 ton/ha. This implies that Indonesia needs to expand wet paddy land from 15.3 million ha in 2010 into 17.4 million ha in 2014. As agricultural land's conversions continue and there is no special effort to create new high yield varieties, it will be difficult to achieve the target. This occurs because rice productivity is relatively constant. To achieve the main target of 10 million tons of rice surplus at the end of 2014/2015, the government needs to extent around 2.1 million ha of new wet land rice or 525,000 ha/year whilst at the same time the area of suitable land for food crops in Western and Eastern part of Indonesia is questionable.

Table 1. Production targeted for three main food commodities in Indonesia, 2010-2014.

Commodities	2010	2011	2012	2013	2014	Growth/ year (%)
	(thousand tons)					
Rice ¹	66,680	68,800	71,000	73,300	75,700	3,22
Corn ²	19,800	22,000	24,000	26,000	29,000	10,02
Soybean ²	1,300	1,560	1,900	2,250	2,700	20,05

¹Milling dry paddy.

²Dry corn and soybean.

Source: SUSWONO (2011).

The top ten rice producers in the world are China, India, Indonesia, Bangladesh, Vietnam, Thailand, Myanmar, Philippines, Brazil, and Japan. Among all these rice producers, China, India, and Indonesia are the biggest rice producers in the world that is of 129.5 million ton/year, 94 million ton/year, and 35.5 million ton/year, respectively (SANTOSA 2008). Rice productivity in Indonesia is lower than those of rice productivity in Vietnam, China, USA, and Egypt, but higher than those in India, Thailand, Philippines, and African countries (Fig. 1).

Rice consumption in Indonesia has decreased from 139 kg/capita/year in 2010 to 130 kg/capita/year in 2012 but this consumption is still high when it is compared to the other Asian countries that consume around 65-70 kg/capita/year. At this moment, the government increase rice production through multiple strategies including extensification and optimalization of food crop land areas, intensifying the use of input production technologies and to find out the new high rice yield varieties. At the same time, the government also promotes a strategy to reduce consumption of imported rice and wheat flour, to accelerate variation of food consumption, and to increase local food consumption that is stated in the President Decree No 22/2009. The main government goal to develop all these strategies is to achieve and to sustain food self-sufficiency particularly for rice, and then soybean, corn, and meat. In fact, food self-sufficiency faces complex, diverse, and dynamic problems for the years to come.

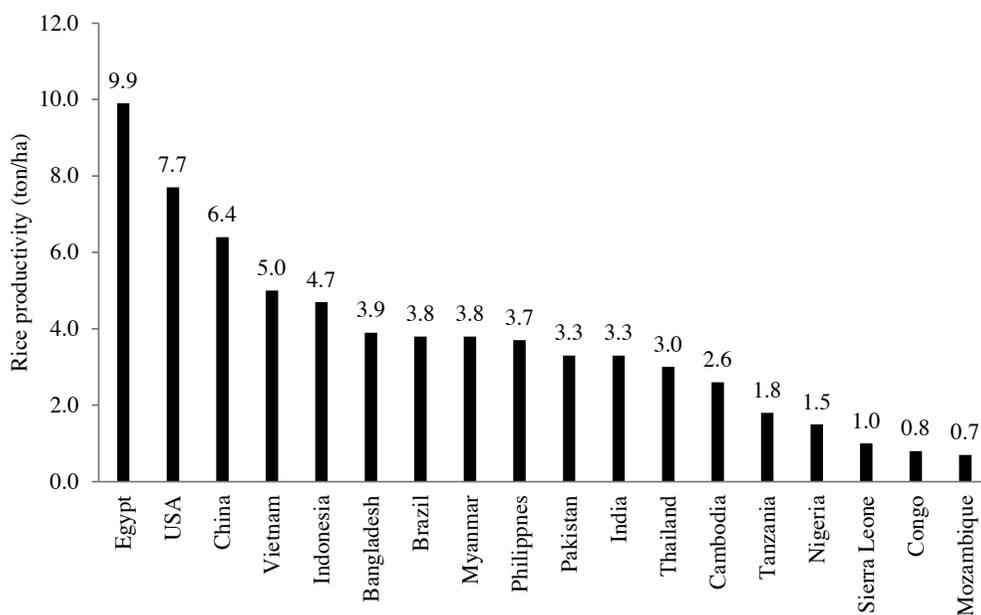


Fig. 1. Wet land rice productivity in Indonesia and several rice producer countries in the world (Source: SUSWONO [2011]).

Challenges of Food Security

The main challenges of food crop development are food usage efficacy, economic scale of farm size, production oriented, low competitiveness of food products, and low agricultural labor productivity. In general, these problems can be seen from the contribution of agricultural sector around 14% to the Gross Domestic Product (GDP) whilst at the same time 40% of national labor still work in agricultural sector. Therefore, the first challenge for food security is low labor productivity and efficiency in agricultural sector because of 40% of agriculture's labor produce of 14% only to GDP.

The second challenge is usage of water competitiveness between water irrigation for agriculture and need of industries in urban areas. Water problem will become more serious because of deforestation and climate change impacts on agricultural production. The climate change impact becomes more serious and more difficult to anticipate as the number of floods in Indonesia occurred around 113 times between 1998 and 2000.

The third challenge is the conversion of agricultural and food crop land into non-farm activities that is around 100,000 ha per year in Java (SUSWONO 2011). The problem is that the agricultural land in Java is 13% of national areas agricultural land but it produces around 60% of food production in Indonesia. Besides, of 60% of population of Indonesia live in Java and Java is the central of industry, trade, and services development that contribute around 50% to national GDP but at the same time conversion of agricultural land to non-agricultural activities in Java probably will cause the loss of the best fertile soil for food crops as the crucial foundation of food self-sufficiency development in Indonesia.

The next challenge of food security is competition of population growth and food production. In 2050 the number of world population will reach around 9.1 billion and it will need to increase 70% of total food production to fulfill global food demand. Asian countries are the place to cultivate of 90% of rice in the world and rice is staple food and the source of calorie to 40-45% of people in the Pacific and even of 70% people in Vietnam, Bangladesh, and Cambodia. If there is no substitution from rice to non-rice staple food, the need of rice will increase by 60% in 2020 and will need to increase rice productivity around 3%/ ha on the existing farm (DOWLING and GREENFIELD 1998). This becomes more difficult as rice productivity tends to stagnant in the last decade. Green revolution technology proved that production can be improved but created new problems in terms of environmental and social economic inequality issues between the large and small size of food crop land.

The last food security challenge is high wheat flour import that is 14% of total Indonesian agricultural products import (SUSWONO 2011). High dependency on wheat flour and other food import will deteriorate the bargaining position of most farmers household who live under poverty line.

The Current Government Policy on Food Security

In facing the dynamics and complex problems of food security, the Indonesian government stated seven components of agricultural revitalization. These components are land consolidation, high seeds productivity, infrastructure, skilled labor, financial capital, institutional development, and technology improvement and downstream industry development. The basic purpose of agricultural revitalization is to enhance food/rice production up to surplus of 10 million tons of rice in 2015, to achieve and sustain rice self-sufficiency, strengthening food security and nutrition security, to increase competitiveness and added value, and to improve farmer income as well as to conserve environment and climate change adaptation (SUSWONO 2011). In order to enlarge the area of rice cultivation outside of Java, the government created the Master Plan of Acceleration Indonesian Economy Development that proposes to develop million hectares of 'rice estate' in Merauke-Papua Province and Eastern Kalimantan. However, this policy is still questionable because of inefficiency in terms of higher price of food because of high transportation and input production costs to distribute food from Papua and Kalimantan into Java.

Next, the government makes a broader perspective and comprehensive approach to the food security and poverty alleviation program. In this case, the main goal of the government subsidized rice policy for the poor is to avoid poor households from the dangerous of food vulnerability. In this term, the government distributes rice and direct cash money to help the poor in rural and urban areas to fulfill the basic needs of household members. At the same time, the government also develop program that is called Community Development National Program (*Program Nasional Pemberdayaan Masyarakat*, PNPM) that promote infrastructure or physical development (human made capital). This program is designed by contemporary bottom up approach that involving NGOs, professional facilitators, and communities. Then, the government provides health insurance and school operational cost as well as scholarship for children of the poor who have good grade in school. At this moment, education is believed by the government as the solution to free the poor household from the poverty trap/deprivation. The basic consideration is good education will produce good job and salary. If one family member of the poor gets a chance to enter a university, to graduate from it, and to have a good job, he will then become the source of financial capital for his/her family members to enter a better school and to get a better job. This action will free the households from poverty deprivation that might be derived from generation to generation.

The Community Empowerment National Program facilitates both infrastructure and micro finance development for the poor households in rural and urban areas. It can be seen from the Fig. 2 that the government focus on material capital rather than strengthening institutional capacity and human skill development. As a result, a physical program may be useful to the whole community but it might have no direct benefit to the poor households.

Base on systems thinking perspective, food security systems in Indonesia can be depicted into three components: input, process, and output. Input of food security consists of four aspects: (a) economic policy on agriculture, fishery, and forestry; (b) infrastructure development including transportation, irrigation water, financial capital, and land protection; (c) social welfare including health, education, and population control; and (d) national stability and security. These four components are the basic national policies as input to shape the performance of the food security policy. The process of food security policy consists of three components at three different levels: (a) national level: availability, distribution, and consumption; (b) household level: income, food access, household consumption behavior, sanitation, and health; (c) individual level: consumption according to the need of nutrition balanced. These food security components are integrated within each other. Both input and process will produce outputs in terms of nutrition status that consists of three components: (a) human right on food; (b) the quality of human resource; and (c) national security. Therefore, the key success factor of national food security in Indonesia will be determined by harmony, synergy, and integrated cooperation between the national government policies that promote rice as staple food and the local government policies that promote local food as staple food.

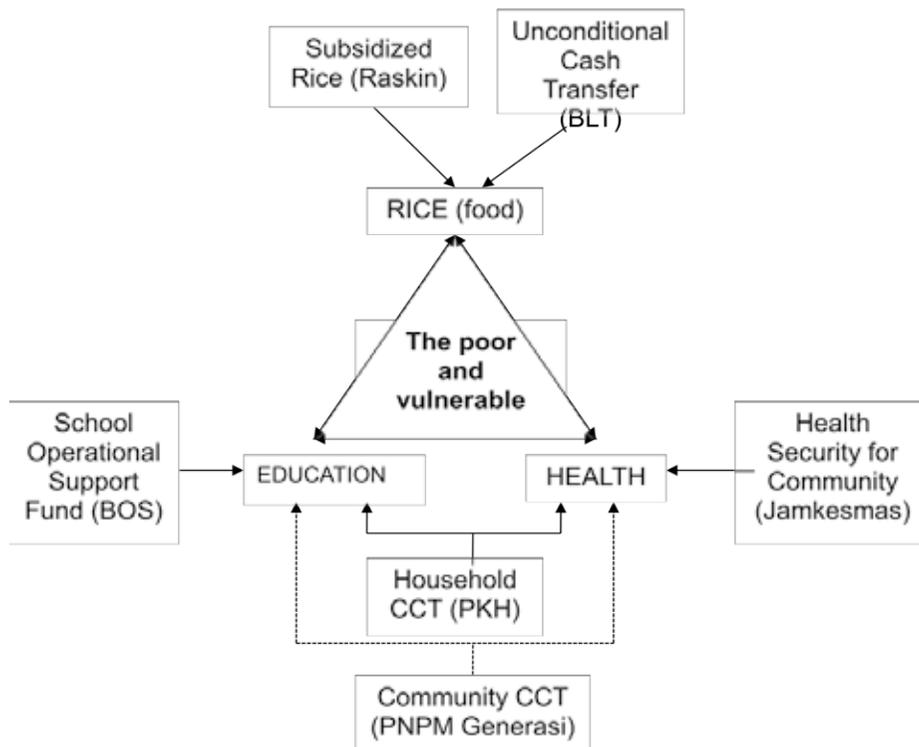


Fig. 2. The government policy on subsidized rice, direct cash money, education, health, and community empowerment for poor households in Indonesia.

Different from Indonesia, it might be useful to learn how Chinese government develops food security policy to fulfill around 1.2 billion of people in China (TAN 2011). Chinese government develops four food security policies. First, Chinese government makes regulation to protect the basic fertile land for agriculture, particularly food crop land. At the same time, Chinese government makes land consolidation to create an efficient or profitable land size and economic scale. It means that there is a no space for land conversion of food crop land and there is a serious sanction to people who disobey the regulation. Food crop land is developed in the frame of cluster of food crop regions that is protected by Chinese government regulation. Second, Chinese government provides special budget to improve agricultural infrastructures, particularly irrigation water dam, fertilizers and other production inputs, transportation, and advanced technology development. Third, Chinese government motivates farmers to cultivate rice by giving incentives and subsidy for fertilizers, tax free for the agricultural products, and technical assistance for agricultural tools and machines. The last policy is to improve farmer's non-formal education and skill through strengthening the role of agricultural extension. The main role of agricultural extension is agent of learning to bridge technology and innovation from research institutions into the farmer/ farmer groups.

In fact, Indonesia has applied the same policies, but controlling on government regulation implementation is lack in the field. As a result, food crop land conversion is still continued in Java and out of Java. The other problems are low quality of agricultural infrastructures and lack of creativity agricultural extension and technology or innovation from research institution to farmers, vice versa. The main difficult problem to solve is land consolidation between and among small scale farmers in rural areas into one cluster of food crop region that might be called as rice estate or 'corporate farming' or 'estate food crop farming'. Land consolidation is pivotal in Indonesia because up to 70% of total farmers are small farmers that need to manage into a partnership relation between farmer groups and food corporate.

Implication to Food Security Systems in Maluku Province

The main goal of national food security policy is to achieve food self-sufficiency particularly in four commodities: rice, corn, soybean, and meat. The central government gives special attention to rice self-sufficiency through targeting 10 million tons of rice surplus in 2015. As a result, the central government promotes rice as the main food security program at the national, provincial, and district levels. What is the national food security policy implication to Maluku Province that has a different food crop resource base with Java?

First, macro policies regarding of food security and nutritional security are suitable to Maluku Province in terms of agricultural and water management, education, health, trade, and

transportation. The other macro policies are economic growth, equality of economic distribution, investment, social and political stability, and institutional development. The goals are to support income improvement, better public services, and access to nutritional food so that people, households, and individuals can have healthy, active, and productive life. These macro policies are the basic input to anticipate external problems such as climate changes and global warming whilst at the same time micro policies like social protection, health, and nutrition are needed to anticipate shock in terms of natural disaster, social conflict, pest, and disease (AZIZI 2013).

Second, different from continental region like Java, Maluku Province is an archipelago region that consists of thousands of small islands. Maluku has 4.63 million ha of agricultural land and most of them are forestry (2.3 million ha), plantation (1.3 million ha), and dry land/up land food crops (718,466 ha). The area of suitable wet land rice is 1.2% (57,120 ha) of total land area (Fig. 3). Therefore, the basic food crop to develop in Maluku is not wet land rice crop but dry land food crops. It means that Maluku food security policies should be based on dry land rather than wet land food crops. The next implication is that the central and provincial governments need a paradigm shift and mind set changes from wet land rice as the only source of staple food and self-sufficiency into dry land non-rice crops. In short, food self-sufficiency should be based on dry land food crops (local food crops) in Maluku. This is pivotal as rice crop has complex challenges because rice crop land in Java has converted into non-farm activities and additional input production tend to stagnate rice productivity and farmer income. Therefore, Indonesian government should make food self-sufficiency based on rice and non-rice crops both in Java and outer of Java.

The crucial problem of food crop land in Maluku is that the usage of agricultural land use is not optimal. It can be seen that wet land rice is used up to 33.28% whilst plantation and dry land for food crops were used 16.48% and 2.85%, respectively (Fig. 4). Food security development based on food crops in the dry land is the pivotal challenge in Maluku Province.

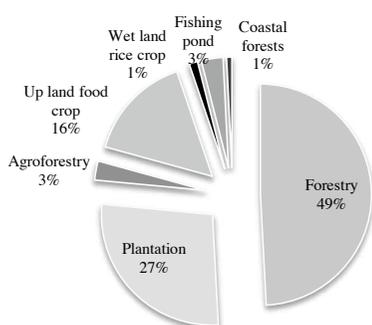


Fig. 3. The potential of agricultural land.

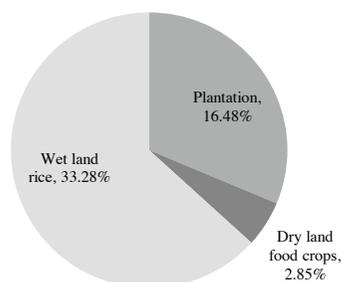


Fig. 4. The usage of plantation, wet land rice, and dry land food crop in Maluku.

Third, wet land rice development is still the priority of the central and local government in Maluku because wet land rice production is the main indicator to measure food self-sufficiency level. If Maluku government follows the central government policy to use wet land rice production as the main indicator of food self-sufficiency, Maluku government needs to extent about 2-3 folds of new wet land rice crops (20,000-60,000 ha) to support rice demand around 170,000 tons per year to feed of 1,63 million of Maluku population. This is an impossible target to achieve because the total area of rice crop that was developed in the last 60 years in Maluku was of 20,000 ha only. The other consequences are high dependency on rice field labor demand from outside of Maluku and environmental degradation problems because Maluku government should converse sago forests into wet land rice. Therefore, rice policy should be focused on intensifying existing rice field in Seram and Buru islands.

Therefore, different from the national food security policy, the foundation of food security and nutrition in Maluku should be based on a local natural and cultural resource base, especially 52,000 ha of sago palm in Maluku as well as tubers and corn in Southeast Maluku regions. Wet land rice, sago palm, cassava, sweet potato, corn, dry land rice crop, breadfruit, and banana should be the source of carbohydrate whilst marine fish is the source of protein. Besides, local vegetables and fruits as the source of mineral and vitamin need to develop in Maluku in order to substitute imported vegetables and fruits.

The important political action plan of food security in the near future is to develop clustering of food crop cultivation regions which is backed up by government regulation. Then, food commodities need to develop through food processing technology prototypes to produce competitive food products. High yield seeds and technology food processing prototypes are the key success factors to accelerate food and nutrition security and dignity in Maluku Province. Food processing technology will promote nutrition security based on flour of sago, cassava, potato, breadfruit, banana, marine fish, and vegetables. This is probably the basic foundation of food product development in the future in Maluku.

Conclusions and Policy Implications

Food security systems in Indonesia are based on rice, corn, soybean, and meat. Food self-sufficiency at the national and provincial levels is the prerequisite to food security at the household and individual levels. In fact, Indonesia still imports all these foods each year, including wheat flour. Because food self-sufficiency is difficult to achieve, the main indicator for food self-sufficiency and food security is limited into wet land rice production. The central government has made a target to achieve of 10 million tons of rice in 2015. As a result, each region including Maluku Province is pushed to cultivate rice to fulfill national target. Due to the complex problem of rice production in line with land conversion, climate change, and

stagnating productivity and farmer's income, a wet land rice production target becomes probably more difficult to achieve in the future. Therefore, it is proposed to change paradigm from wet land rice crop into both wet land rice and dry land food crops. Based on land suitability for food crops in Maluku, it is recommended that the main indicator to measure food self-sufficiency and food security in Maluku should be based on dry land food crop rather than wet land rice crop whilst existing wet rice field need to sustain and intensify.

References

- AZIZI, M. N. 2013. Crops for the Future Research Centre: Beyond Food Security. Paper presented at the International Conference on Science and Innovation, British Council, Jakarta, 17-19 September, 2013.
- DOWLING, N. G. and GREENFIELD, S. M. 1998. Introduction and Overview. In: Sustainability of Rice in the Global Food System (DOWLING, N. G., GREENFIELD, S. M. and FISCHER, K.S. eds), 1-7 pp., Pacific Basin Study Center, Davis, Calif, USA, and International Rice Research Institute, Manila, Philippines.
- SUSWONO 2011. The Indonesian Food Security in the Perspective of Global Economy and National Sovereignty. Paper presented at the International Conference on "The Future of Global Food Security and Safety: Issues and Justification", IPB International Convention Center, Bogor, 27 October, 2011.
- TAN, X. L. 2011. How China Feeds Its Increasing Population? Paper presented at the International Conference on "The Future of Global Food Security and Safety: Issues and Justification", IPB International Convention Center, Bogor, 27 October, 2011.