

THE COSTS OF OBTAINING FOOD SECURITY IN VIETNAM

By Nguyen Van Ngai¹

Global food crisis happened in 2008, all countries in the world must pay attention on food security. Although Vietnam is a food export country, food security is targeted as a priority in the process of economic development. Obtaining food security will gain political and social stabilities, but it may create negative impacts on agricultural development and economic development as a whole. This paper overviews some key policies on food security, analyses the current food security, projects food security in Vietnam until 2020, investigates the costs of obtaining food security and draws policy recommendations.

I. Introduction

In recent decades, food security has been an important ‘organizing principle’ in development. There are a number of researches, aid agencies, and programmes of actions have been carried out in an attempt to ensure food security. The concept of ‘food security’ has developed over the past three decades. Four components of food security is widely accepted that are availability, accessibility, sustainability and safety at different levels such as international, regional, national and household levels. Although Vietnam is the second leading rice exporting country, food security is still an issue that need to be considered, not only at national level but also household and individual levels. At the national level, Vietnam has been trying to develop its agriculture to meet the objective of food security since food security is recognized as an important issue in terms of economics, politics and society as a whole. Moreover, in 2008 global food crisis make Vietnam worried more about food security. If the country worries too much about food security, it gives priority on food production for self-

supply and thus allocates a lot of resources for food production, rice in particular, it may result in negative impacts on agricultural development and the economy as a whole. Vice versa, if the country sets priority to agricultural development in terms of agricultural growth rate and economic growth, it may result in high risk in obtaining food security. This study reviews policies related to food security in Vietnam, analyses current food supply and demand and projection until 2020, identifies trade-offs between food security and agricultural and economic development and draws policy recommendations.

II. Review of Food Security Policies in Vietnam

Even though Vietnam is a food export country, Vietnamese Government and Vietnamese Communist Party always set food security as a priority in making policies during the process of economic development. The Tenth Congress of Vietnamese Communist Party agreed that Vietnam must plan the area for growing rice in order to get stable rice production and obtaining food security. The policies supporting food security include policies related to rice growing such as land policy, investments and trade policy. In terms of land policy, in 1993 the land law was issued allowing rice farmers to have more autonomy in making production decisions. However, in order to obtain food security, the government issued Decisive No. 68/2001/ND-CP on 1st October 2001 that attempted to control paddy land by limiting farmers to convert their paddy land to other crops or other uses. In 2006, Vietnamese Assembly issued Decisive No. 57/2006/NQ-QH11 that strictly controlled converting from paddy land into other

¹ Nong Lam University, Ho Chi Minh City, Vietnam
Email: nvngai@hcmuaf.edu.vn, nguyen_van_ngai@yahoo.com

using purposes. Moreover, farmers were also exempted from agricultural land tax. On 18 April 2008, Prime Minister signed Decisive 391/2008/QĐ-TTg to check the implementation of agricultural land use plan, rice land in particular.

Vietnamese Government has also supported food security by providing public investments in agriculture, especially in building irrigation system for areas growing rice. About 80% of irrigation investments has been contributed to rice production. Moreover, on 22 October 2004, Prime Minister signed Decisive, No. 184/2004/QĐ-TTg, to improve the irrigation system connecting to farmer land and rural transportation system. Trade policy is the other tool that Vietnamese Government applied to obtain food security at national level. In general, the restrictions of rice export such as export taxes or export quotas have been removed, but the government still has a role in management of food security by controlling rice export contracts based on the balance of domestic demand and supply. For example, in March 2008, when food price in the world sharply increased due to high international demand for food, Prime Minister announced the regulation to

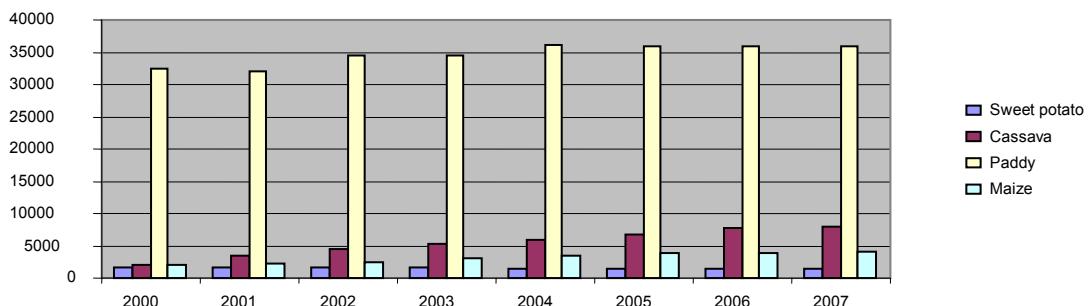
stop signing rice export contracts between Vietnamese export companies and their rice export partners. Moreover, some policies supporting rice production such as research and applying new rice varieties, technological trainings, exemption of irrigation fees and encouraging rice farmers doing contract farming have been applied.

III. Current Food Security in Vietnam

3.1. Food supply

Food includes staple food (rice, cassava, sweet potato, maize, etc.) and food stuffs (meat, vegetable, egg, milk, etc.). This study focuses on staple food, rice in particular since it is a leading staple food in Vietnam. Staple food in Vietnam has significantly increased over the period of 1986-2007 after the ‘renovation program’ started in 1986 that conducted a transitional phase from the centrally-planned economy to a market oriented economy. As a result of that program, Vietnam became the third largest rice exporter in the world in 1989, behind Thailand and USA. Since 1989, Vietnam has firmly obtained its food security at the national level. The production of staple foods has continuously increased during the 2000s (see Figure 1).

Figure 1 : Production of Some Staple Foods, Vietnam, 2000-2007, 1000 tones



Source : GSO, 2008.

Table 1
Cultivated Area, Production, Yield of Paddy, Vietnam, 1990-2007

	Cultivated area *(1000ha)	Annual growth rate	Production (1000 tones)	Annual growth rate	Yield (tone/ha)	Annual growth rate
1990	6042.8	-	19225.1	-	3.18	-
1991	6302.8	4.3%	19621.9	2.1%	3.11	-2.1%
1992	6475.3	2.7%	21590.4	10.0%	3.33	7.1%
1993	6559.4	1.3%	22836.5	5.8%	3.48	4.4%
1994	6598.6	0.6%	23528.2	3.0%	3.57	2.4%
1995	6765.6	2.5%	24963.7	6.1%	3.69	3.5%
1996	7003.8	3.5%	26396.7	5.7%	3.77	2.1%
1997	7099.7	1.4%	27523.9	4.3%	3.88	2.9%
1998	7362.7	3.7%	29145.5	5.9%	3.96	2.1%
1999	7653.6	4.0%	31393.8	7.7%	4.10	3.6%
2000	7666.3	0.2%	32529.5	3.6%	4.24	3.4%
2001	7492.7	-2.3%	32108.4	-1.3%	4.29	1.0%
2002	7504.3	0.2%	34447.2	7.3%	4.59	7.1%
2003	7452.2	-0.7%	34568.8	0.4%	4.64	1.1%
2004	7445.3	-0.1%	36148.9	4.6%	4.86	4.7%
2005	7329.2	-1.6%	35832.9	-0.9%	4.89	0.7%
2006	7324.8	-0.1%	35849.5	0.0%	4.89	0.1%
2007	7201.0	-1.7%	35867.5	0.1%	4.98	1.8%
Average (1990-2007)	7071.1	1.1%	29087.7	3.8%	4.10	2.7%
Average (2000-7)	7427.0	-0.8%	34669.1	1.7%	4.7	2.5%

Source : GSO, 2008.

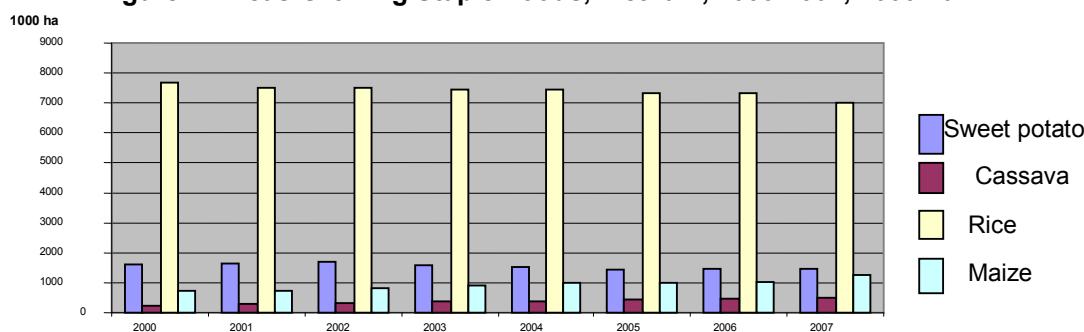
Note : * Cultivated area equals planted area times the number of crops per year.

Paddy production nearly doubled over the period of 1990-2007, 19 million tones in 1990 and 36 million tones in 2007 (see Table 1). The annual growth rate of paddy production was about 3.8% as a result of 1.1% increase in cultivated area and 2.7% increase in yield.

Reduction in cultivated paddy area during the year 2000s

However, during the year 2000s, paddy production continued increasing at slower growth rates, (1.7% annual growth rate). The slowdown of the growth rate can be explained by some pressures in the economy that reduced land areas for paddy production (see Figure 2), even though the yield remained at more than 2% increase per year.

Figure 2: Areas Growing Staple Foods, Vietnam, 2000-2007, 1000 ha



Source : GSO, 2008.

Table 2
Changes in Agricultural Land in 2006 compared with 2001, 1000 ha

	Year		Changes	
	2001	2006	1000 ha	%
Total	21224.45	24696.0	3471.15	16.35
Agricultural land	8879.06	9436.16	557.1	6.27
Annual crops	6064.34	6348.15	238.81	4.68
Paddy rice	4337.75	4130.94	-206.81	-4.77
Perennial tree	2814.72	3088.01	237.29	9.71
Forestry	11822.99	14514.23	2691.24	22.76
Fishery	503.47	715.11	211.64	42.04

Source : GSO, 2007.

Figures in Table 2 show that during the 2000s planted paddy area was reduced about 1% a year in average, 4.3 million ha for paddy production in 2001 and 4.1 million ha in 2006. Farmers converted their rice land into other crops (sugarcane, fruits) or fishery (shrimp and fish). The land for fishery increased from 0.5 million ha in 2001 to 0.7 million ha in 2006. Land for

non-paddy annual crops and for perennial trees also increased during that period of time. Low incomes in paddy production is the reason that farmers change their crops to get higher incomes. They also use paddy land to build ponds for producing shrimp or fishes which can export to gain much higher incomes.

Table 3
Cultivated Paddy Area by Regions of Vietnam, 2000-2007, 1000 ha

Year	Country	Red River Delta	North-east	North-West	Central North	Central South	High-land	South-east	Mekong Delta
2000	7666.3	2121	550	136	695	422	176	526	3945
2002	7504.3	1196	562	140	700	399	186	484	3834
2004	7445.3	1161	557	151	685	401	198	475	3816
2006	7329.4	1124	553	154	683	392	208	435	3773
2007	7021.0	1111	553	158	683	376	205	432	3684
Change 2007/2000	-645.3	-101	+3	+22	-12	-46	-29	-94	-261

Source : GSO, 2008.

It is noted that the reduction of cultivated paddy land in Vietnam during the 2000s happened in two important paddy production regions in Vietnam, Red River Delta (decreasing 101 thousands ha) (see Table 3) and Mekong Delta (decreasing 261 thousands ha). The reduction of paddy area in these regions is due to the urbanization, the government established many industrial parks on the paddy land. Farmers have to return their land-use right to the government and get some compensations. Industrialization is one of key objectives of Vietnamese Government in the process

of economic development. Losing paddy land for that objective may be appropriate. However, the problem is that approximately 50% of land in industrial parks has not been leased by investors. Climate change is another pressure that affects the paddy land area, particularly in the two deltas. Vietnam is in the top five countries vulnerable to climate changes. If the sea level rises by 1 meter, Vietnam will lose 5% land, in which, Thai Binh, Hai Phong, An Giang, Dong Thap, Tien Giang, Vinh Long and Ca Mau provinces will seriously be affected. Vietnam paddy production will be reduced

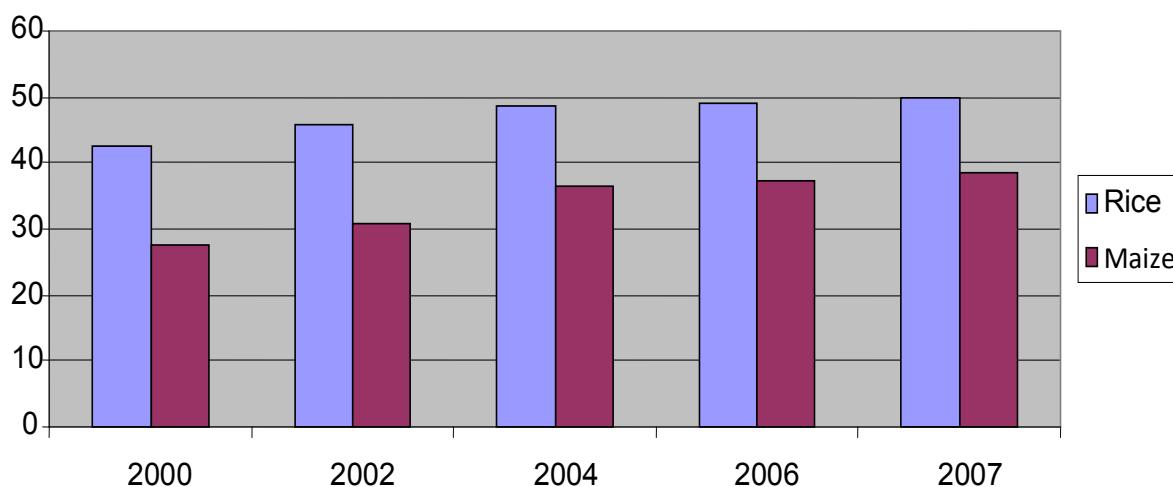
by 5 million tones per year due to climate changes. (Vietnam Media, 2008).

Achievement in high paddy yield

As above discussed, even though paddy land area has been decreasing but paddy production still keeps increasing, the achievement in high paddy yield is a reason for that. The average annual growth rate of

paddy yield during the 2000s is 2.5 percent per annual, the law of diminishing marginal product in paddy production is rather clear over the period of 2000-2007, the yield increased at the diminishing growth rates. Improving technology and investments are considered as main reasons for achievement in high paddy yield.

Figure 3: Yield of Paddy and Maize, Vietnam, 2000-2007, 100kg/ha



Source : GSO, 2008.

Growing paddy in the Red River Delta results in highest yield in Vietnam, 5.67 tones per ha in 2007, while Mekong Delta is a leading region for growing paddy in Vietnam but the yield is still

lower, 5.06 tones per ha in 2007 (see Table 4). Therefore, increasing paddy production in Vietnam by improving yield in Mekong Delta is very potential.

Table 4
Paddy Yield by Regions of Vietnam, 2000-2007, tones/ha

Year	Average	Red River Delta	North-east	North-west	Central North	Central South	High-land	South-east	Mekong Delta
2000	4.24	5.43	4.00	2.95	4.06	3.98	3.32	3.19	4.23
2002	4.59	5.64	4.22	3.27	4.51	4.28	3.25	3.47	4.62
2004	4.86	5.78	4.47	3.63	4.93	4.71	3.95	3.75	4.87
2006	4.89	5.81	4.54	3.80	5.10	4.91	4.29	3.91	3.91
2007	4.98	5.67	4.56	3.64	4.74	5.09	4.19	4.24	5.06

Source : GSO, 2008.

3.2. Food demand

Demand for food includes domestic demand and foreign demand. Domestic demands consists of demand for seeds for reproduction, human consumption, animal

feed, processing for food and reserves to stabilize the market fluctuation as needed. Of which, seed, human consumption and animal feed are considered as necessary demands that cannot be missed. The foreign

demand refers to exports to the world markets for foreign exchange earnings. A country just exports food as there is food surplus after meeting domestic demands.

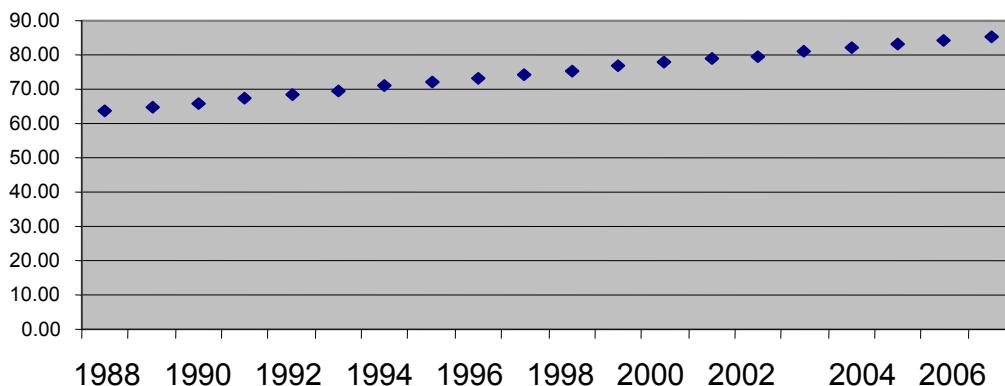
Domestic food demands

Human consumption and animal feed are two main sources of rice consumption in Vietnam, 66.4% and 24.3%, respectively. As many Asian countries, rice is a daily food for Vietnamese people. Since 1989, domestic rice production has met human consumption in Viet Nam. Vietnamese people just consume about 54% of total rice production. Thus, Vietnam has firmly obtained its food security at the national level.

Rice consumption in Vietnam depends on population and components of daily diet. Population growth in Vietnam was about 1.6% per annual, average in 1986-2005 (GSO, 2008), thus, rice consumption must be increased by the same percentage if there is no change in the components of daily diet. Population growth imposes the pressure on human rice consumption and thus on food

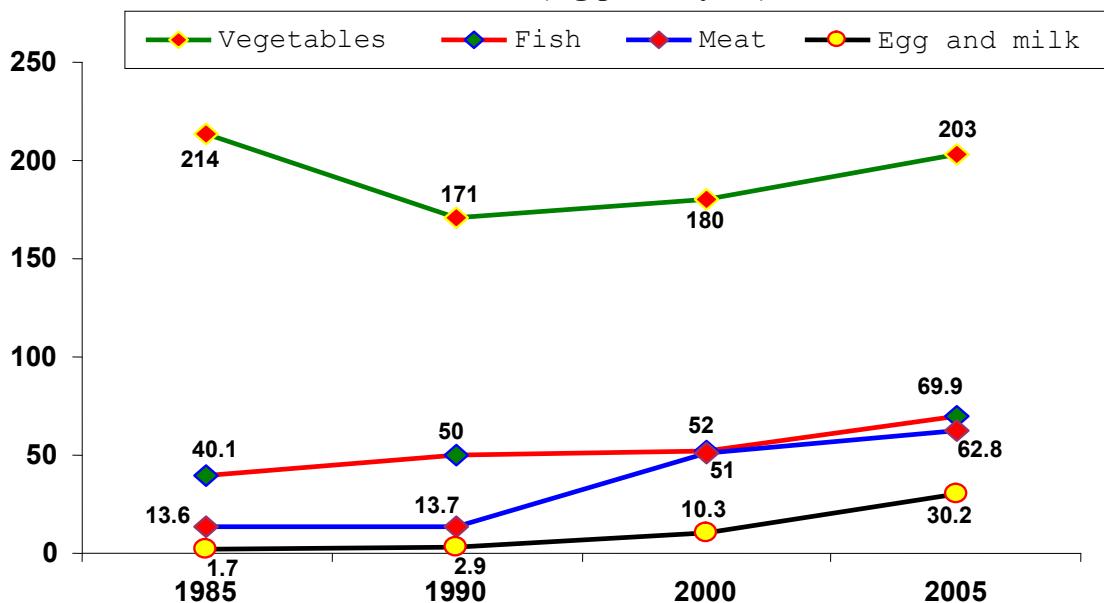
security. However, Vietnam is a low income country, an increase in incomes leads to changes in components of daily diet that shift to consume more food stuffs and less staple food, rice in particular. Rice consumption per head reduced from 156 kg/person/year in 1992 to 120 kg/person/year in 2006 (GSO, 2009). In average, the rice consumption decreases about 1.7% per annual as a result of increase in incomes that eases the pressure on food demand due to population growth. People will consumption more food stuff, meat in particular. According to the study of Pham Thi Lan Anh, Pham Van Hoan and Nguyen Duc Minh (2009), meat consumption per head increased 5 times over the period of 1985-2005 or about 24% increase per annual (see Figure 5) and 4.5% over the period of 2000-2005. If the demand for meat continues increasing, the supply of meat must increase to meet increasing meat demand, and therefore, as a consequence the demand for rice to produce animal feed must be higher.

Figure 4: Population, Vietnam, 1988 – 2007, million people



Source : GSO, 2008.

Figure 5: Changes in Consumption of food - stuffs, Vietnam 1985 - 2005,(Kg/person/year)



Source : Vietnamese Institute of Nutrition

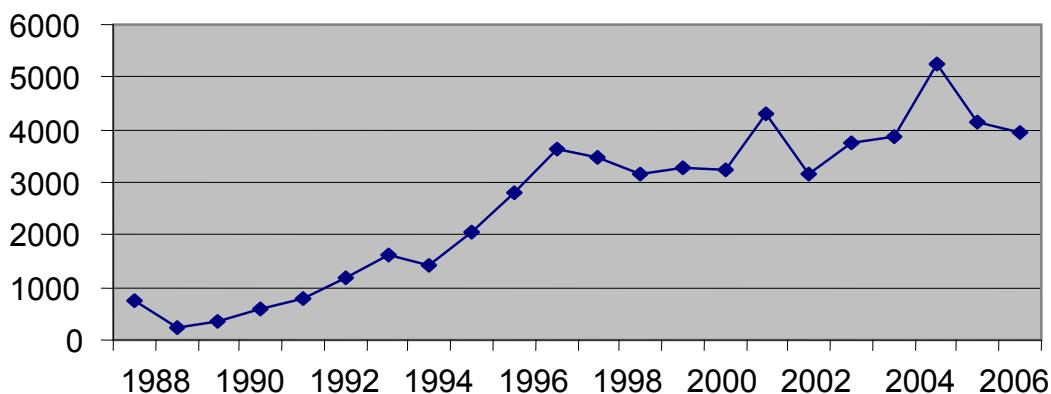
Source : Pham Thi Lan Anh, Pham Van Hoan and Nguyen Duc Minh, 2009

Exports

Vietnam has become a food export country since 1988, just after two years implementing the ‘renovation program’. Because the domestic demands have increased at the slower rate compared to

the growth rate of rice supply, the volume of rice exports has been increasing over years (see Figure 6). Asian countries such as Philippines, Indonesia and Malaysia are the main rice importers of Vietnam.

Figure 6: Rice Export, Vietnam, 1986 – 2007, 1000 tones



Source : GSO, 2008.

IV. Projection of Food Security in Vietnam Until 2020

In order to understand how food security in Vietnam until 2020, some assumptions of rice supply and rice demand must be proposed. In the supply side, planted paddy area are expected to decrease 1% per annual with the assumption that land for producing paddy continues decreasing

as the average rate during the period of 2000-2007. The number of crop per year is expected to be unchanged, 1.8 crops per year. In order to meet increasing demand with decreasing paddy cultivated area, the yield must be raised. Keeping 2.5% yield increase per annual until 2020 is proposed. In the demand side, three necessary domestic demands, which are seed, animal feed and

human consumption, must be projected. Paddy demand for seed is based on the projected cultivated area and the unchanged amount of paddy seed per cultivated ha. The projected human consumption is based on the forecasted population growth and rice consumption per person per year that is expected to be 1.7% decrease per year. The amount of paddy for human consumption in 2020 will be about 20 million tones. In order to project the amount of paddy for animal feed, over the period of 2000-2005, the meat consumption increased by 4.5% per annual in average as studied by the Vietnamese Institute of Nutrition. Thus the demand of paddy for animal feed is

projected to increase by 4.5% per annual. In 2020, Vietnam will need 11 million tones of paddy for animal feed that is about a half of human consumption. In conclusion, the necessary demands (seed, animal feed and human consumption) in 2020 will be about 31 million tones, if there is no change in supply (35.8 million tones in 2007), there are only 4 million tones left for the other demands such as reserve, processing and exports) in 2020. If taking above projected paddy supply and necessary demands together, Vietnam will have 11.71 million tones left for reserve, processing and exports in 2020.

Table 5
Balancing Paddy Demand and Supply, 2020

	2007*	2010	2015	2020	Assumptions
1. Population (million people)*	85.2	88.5	93.6	98.6	
2. Planted paddy area (million ha)	4.10	3.98	3.78	3.59	1% decrease per annual
3. Cultivated paddy area (million ha)	7.20	7.16	6.80	6.46	1.8 crops per year, unchanged
4. Yield (tone/ha/crop)	4.98	5.35	6.02	6.78	2.5 % increase per annual
5. Supply (million tones)	35.8	38.32	40.96	43.77	
6. Necessary Demands (million tones)					
- Seed	1.10	1.09	1.04	0.99	
- Animal feed	6.4	7.26	8.90	10.90	4.5% increase per annual
-Human consumption	19.97	19.79	20.02	20.17	1.7% decrease in rice consumption per person per annual
7. Balance (million tones) (Reserve, process and exports)	8.33	10.17	11.00	11.71	

Source : *Estiamted*

Note : * *Adapted from Chu Tien Quang, 2008.*

The projection of paddy production in 2020 must depend on the assumption of 2.5% increase in paddy yield per annual that is the average rate over the period of 2000-2007. However, in order to achieve that assumed rate is not easy that depends on many factors. Figures in Table 6 provide the projection of necessary demands, supply and balance by different scenarios of yield, 2.5%, 2%, 1.5%, 1%, 0.5% and 0% increase per annual. The important signal is that if the paddy yield is unchanged from now to

2020, Vietnam will have only 0.11 million tones of paddy for reserve, processing and exports in 2020. Vietnam will face with the food insecurity at the national level. Therefore, under the pressure of the decreasing paddy area, in order to obtain food security, Vietnam must look for strategies to increase the paddy yield.

V. Costs of Obtaining Food Security in Vietnam

Like several Asian countries in the region, rice in daily diet is a Vietnamese

Table 6
Supply, demand and balance of paddy by yield assumptions,
Vietnam, until 2020, (million tones)

Assumption of increase in yield		2007	2010	2015	2020
2.5% per annual	Supply	35.80	38.32	40.96	43.77
	Demand (seed, animal feed and human)	27.47	28.15	29.96	32.06
	Balance (reserve, exports, processing)	8.33	10.17	11.00	11.71
2.0% per annual	Supply	35.80	37.79	39.49	41.27
	Demand (seed, animal feed and human)	27.47	28.15	29.96	32.06
	Balance (reserve, exports, processing)	8.33	9.64	9.53	9.20
1.5% per annual	Supply	35.80	37.25	38.05	38.85
	Demand (seed, animal feed and human)	27.47	28.15	29.96	32.06
	Balance (reserve, exports, processing)	8.33	9.10	8.09	6.79
1.0% per annual	Supply	35.80	36.72	36.63	36.54
	Demand (seed, animal feed and human)	27.47	28.15	29.96	32.06
	Balance (reserve, exports, processing)	8.33	8.57	6.67	4.47
0.5% per annual	Supply	35.80	36.18	35.23	34.31
	Demand (seed, animal feed and human)	27.47	28.15	29.96	32.06
	Balance (reserve, exports, processing)	8.33	8.03	5.28	2.25
0.0% per annual	Supply	35.80	35.65	33.87	32.17
	Demand (seed, animal feed and human)	27.47	28.15	29.96	32.06
	Balance (reserve, exports, processing)	8.33	7.50	3.91	0.11

Source : Estimated.

tradition, after any generous meal without rice, Vietnamese people feels that they have not finished the meal. Rice is a staple food that cannot be substituted. If food security is a problem in the world, rice security is an Vietnamese issue. Obtaining rice security must be considered as a first priority for political and social gains, and in turn economic stability. As discussed above, in order to meet the objective of food security, Vietnam must focus on the supply side since the increasing demand cannot be reduced. There are two options for increasing paddy production that are the expansion of paddy land areas and improving yield. Those

impose some costs in terms of economic development in Vietnam. Agricultural growth, industrial growth and household incomes may be negatively affected by the obtaining food security.

The option that increases the paddy yield is rather difficult since the yield in Vietnam is currently high. There are some constraints in increasing the yield including technological and economic constraints. The rice production is, of course, characterized by the law of diminishing marginal product. Getting higher rice yield needs high level of inputs and investments that may not be efficient.

Table 7
Comparison of staple food production with the others
(Million VND/ha, constant prices in 1994)

	Staple Food	Vegetables, beans	Fruits	Fishery
2000	6.57	8.14	10.81	33.93
2001	6.69	8.71	10.50	33.58
2002	7.16	9.19	10.17	34.60
2003	7.29	9.62	9.69	35.27
2004	7.54	9.67	9.85	37.43
2005	7.61	10.39	10.44	40.51
Average	7.14	9.28	10.24	35.89
Index, staple food=1	1	1.30	1.43	5.02

Source: Estimated by using data of GSO (2006 and 2008)

Reserve or expansion of land for paddy growing to meet the objective of food security may lower the agricultural growth. In general, land productivity of rice is much smaller than that of other crops. Based on the official data of GSO, it is estimated that one hectare of land for producing vegetables, sugar and beans, for fruits and for fishery is equal to 1.30, 1.43 and 5.02 times as that for paddy production, respectively (see Table 7). Thus, shifting land from non-paddy production to paddy production will result in lower land productivity and smaller agricultural production. Over the period of 1990-2007, the average growth rate of agricultural sector was about 4% per annual, while the average growth rate of paddy production was 1.1%, particularly it became negative for the period of 2000-2007 (-0.8%). Moreover, if the government prohibits farmers to change their crops from paddy to other crops to reserve paddy land for the purpose of rice security, the value of agricultural production is difficult to increase and in turn, the agricultural growth is negatively affected.

The strategy to meet the objective of food security creates negative impacts not only on agricultural growth but also on economic growth in general. The problem of converting paddy land to non-

agricultural uses such as building industrial parks, golf and etc. has been criticized by many people. If because of worrying rice security, the government stops that land converting, the cost is too high. It will affect the process of industrialization and slowdown positive structural change and thus economic growth.

For an exported food country like Vietnam, obtaining food security by restricting exports in order to maintain domestic consumption will result in lost export revenue and foreign exchange earnings (FAO, 2008) that happened in Vietnam in the first months of 2008 as the global food crisis occurred. It is also noted that although Vietnam is enjoyable with its rice exports but the contribution of rice exports to total exports is still limited. The agricultural exports contributed about 15% of total exports, but exports of commercial crops such as rubber, coffee, pepper and cashew nut play crucial role. Fishery exports have been playing important role in recent years, if the government attempts to keep paddy land that may lead to negative impacts on fishery exports and thus on total exports.

The other negative impact of rice security at national level may be food insecurity at the household level. Small

farm households keeping their small rice farm may not lead them to a low income family who cannot access to food and thus the food insecurity at household level.

VI. Conclusions and Policy Recommendations

There is a trade-off between obtaining food security and economic development in Vietnam. The increase in food demand as population pressure is unavoidable. In order to meet increasing demand, rice supply must be increasing. In order to increase rice supply to obtain food security, political and social stability can be achieved, but some negative impacts on economic development occur. Keeping or expansion of paddy land for food security will dampen agricultural growth and thus economic growth as a whole, because of forgone high land productivity of the other crops. Lower land productivity for paddy production cannot improve incomes of poor rice farmers that result in food insecurity at the household level. Because of food security, preventing from the using paddy land for the purpose of industrialization may harm the industrial development and thus economic development as a whole.

Regarding to the issue of food security in Vietnam, this study recommends some policies as follows. The government should set a priority on increasing the paddy yield rather than regulating changes of land areas. If the paddy yield is not increased, the food security may achieve until 2020, however, the problem will become serious after 2020. Increasing paddy yield is not simple, it requires a lot of investments. Improving technology must be considered as a decisive strategy, biotechnology in particular.

Since there are different types of demand for rice, the strategy of variety selection becomes important issue. In general, a high-yield variety usually results in low quality and vice versa. High-quality varieties must be applied for rice exports, while high-yield varieties are grown for

animal feed and middle-quality varieties with middle-yield should be grown for human consumption.

Global food crisis generates more benefits than harms for Vietnamese agricultural sector and economy. Because Vietnam has been a net food export country, it benefits from high international food price as a result of global food crisis. Food insecurity in the world is an opportunity for Vietnam obtaining food security at both national and household levels. Vietnamese rice farmers get benefits from higher price and thus they do more investments and get higher yield that results in more supply and positive impacts on food security at national level. Poor rice farmers now get more incomes from their small amount of rice selling. Higher international rice price will bring more foreign exchanges from the some volume of rice exports. However, high prices of food may lead to difficulties in macroeconomic management that affects economic growth in the short run and in the long run. Higher prices of food significantly influence consumer price index (CPI) because food expenditures share about 47% of Vietnamese consumers' basket. High CPI leads to inflation that may be a problem for macroeconomics.

VII. References

- Chu Tien Quang, 2008, *San Xuat Lua Gao va Van De An Ninh Luong Thuc o Viet Nam [Rice Production and Problems of Food Security in Vietnam]*, Bao cao Hoi Nghi Khoa Hoc Kinh Te, 27-28/11/2008, Hanoi.
- FAO, 2008. *The state of food insecurity in the world*, <http://www.fao.org/icatalog/inter-e.htm>
- General Statistical Office (GSO), 2007. *Statistical Yearbook 2006*, Statistical Publishing House, Hanoi.
- General Statistical Office (GSO), 2008. *Statistical Yearbook 2007*, Statistical Publishing House, Hanoi.

- GSO, 2009. 'Consumption expenditure and consumption expenditure for living', extracted from Vietnam Household Living Standard Survey, <http://www.gso.org.vn>
- Nguyen T. Song An and others, 2001. *Household Food Security in the Tu Giac Long Xuyen*. Research Project, Code: B99-22-50.
- Nguyen Van Sanh (2005) 'Food Security, Livelihood and Rural Development', A Report at a Workshop on Food Security in Vietnam in Nong Lam University, October 2005.
- Pham Thi Lan Anh, Pham Van Hoan and Nguyen Duc Minh, 2009. 'Nguy Co Mat An Ninh Thuc Pham do Bien Dong ve Tu Nhien va Kinh Te Xa Hoi [Risk of losing foodstuff security due to Natural and Socio-economic changes]', ([http://www.isgmard.org.vn/Information%20Service/Report/Plenary%20Meeting%20Report%2017-11-2008/Group%203/Bao%20cao%20tham%20luan%20Bo%20Y%20te%20\(Mr.Hoan\).doc](http://www.isgmard.org.vn/Information%20Service/Report/Plenary%20Meeting%20Report%2017-11-2008/Group%203/Bao%20cao%20tham%20luan%20Bo%20Y%20te%20(Mr.Hoan).doc))
- Trang Thu Huy Nhat and Tran Quang Van, 2008. 'Food security and rural development' in *Bases for Territory-based Rural Development in the Southeast Region, Vietnam*, Nguyen Van Ngai and Le Thanh Loan (eds.), VNU-HCM Publisher, Ho Chi Minh City.
- Trung Tam Tin va Tu lieu, CIEM, 2008. *Dam Bao An Ninh Luong Thuc The Gioi va Viet Nam [Obtaining Food Security in the World and Vietnam]*. <http://www.ciem.org.vn/home/vn/home/InfoList.jsp?area=1&cat=124:bang>
- Vietnam Media, 2008. 'Vietnam co nguy co mat 5 trieu tan thoc do bien doi khi hau, [Vietnam can lose 5 million tomes of paddy per year due climate changes]', <http://www.vnmedia.vn>.