

COUNTRY REPORT: VIET NAM

**FOOD SECURITY AND SUSTAINABLE
AGRICULTURE IN VIET NAM**

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By

Dr. Tran Mạnh Hùng

Organization: Viet Nam Institute of Agricultural Engineering and Post-harvest Technology (VIAEP)

Address: 54/102, Truong Chinh Rd., Dong Da Dist., Hanoi, Viet Nam.

Tel: +84 4 8687884; Fax: +84 4 8689131; Email: vilas019@hn.vnn.vn

I. INTRODUCTION

In 2005, 777 million people were food insecure in 70 lower income countries in the world. For the 70 countries, on average, there has been a slight (7 per cent) decline in the number of hungry people from 688 million in 1992-94 to 639 million in 2002-04. The largest decrease occurred in North Africa. Both Asia and the Commonwealth of Independent States experienced a 30-per cent drop in the number of hungry people. The number of hungry people in Latin America and the Caribbean has varied slightly over time, but there has been no discernible trend across the region as a whole [3, 19].

Despite strong growth in food production, Sub-Saharan Africa is the only region where the number of hungry people has risen-over 19 percent-during the last decade. In 2002-04, more than half of the region's population-roughly 350 million-were hungry. Between the 2002-04 base period and 2015-the World Food Summit target date for reducing the number of the world's undernourished people by half-results indicate a 10-percent increase in the distribution gap (the amount of food needed to raise consumption levels to nutritional requirements) and a 16-percent jump in the number of hungry people.

Viet Nam's success in achieving rapid agricultural growth since the implementation of policy reforms in the late 1980s is now well documented (World Bank 2004). Agri-cultural growth was fueled mainly by growth in rice productivity following the rapid adoption of modern varieties, increased fertilizer use, and increased cropping intensity. The policy reforms created the right economic incentives for farmers to adopt yield-increasing technologies. Rice production grew at more than 5 per cent per annum during the early 1990s and Viet Nam rapidly achieved the status of a major exporting country [7, 17].

Situated in South East Asia in the Indochinese Peninsula, Viet Nam territory is lasting from 8.45-23.22 latitude and between 102.08 and 109.30 longitudes. It has 330,990 sq. km of natural area, in which 7,348.5 thousand hectares (22.2 per cent) is arable land, with population about 80 millions.

Viet Nam lies in the region of monsoon, tropical climate with a high temperature; the average temperature varies between 21°C and 27°C, rainfall volume of 1800-2000mm/year and is not evenly distributed among the months of the year. Versatile and various climates of the regions create a variety of vegetation and domestic animals (originated in the temperate, sub-tropical and tropical areas). It is bad when climate is drought in the dry-season and floods and storms in the rainy season.

Being an agricultural country, 75 per cent of Viet Nameese labor-force is engaged in agriculture, forestry and fisheries. This sector contributed roughly 20 per cent of the GDP. The output value structure of agriculture, forestry and fisheries was 77 per cent, 4 per cent and 19 per cent, respectively.

Viet Nam economy is still classified as one of the developing countries in the World. Average GDP in 2005 was only 643 USD per capita. The yields of crops and animals, also market for export of agro-products is not stable with price of (60 – 70) per cent in comparison with that of other countries in the region. The annually average birth-rate of 2.2 per cent nationwide is still high, esp. it is higher in rural areas, causing a big difficulty in economic development (MARD).

Viet Nam is determined to end food shortages by 2005 and to surpass international nutrition standards by 2010-with each citizen's daily food intake reaching 2600–2700 calories. Its population is expected to reach 95-100 million before the end of this decade, so there is no secret about what needs to be done: food productivity, crop diversity, and grain quality all have to increase to cover growing demand [7, 10].

II. REQUIERMENT OF FOOD AND DAILY NUTRITION

The population of Viet Nam increases in the next years should reached 100 millions in 2020, and about 120 to 130 millions after 2030. Food demand and food price also rise relatively while the increasing speed of yields and cultivating area will decrease significantly, increasing cost of inputs to agricultural production, impact of natural disasters (typhoons, floods and insects ...). Food security is ensured when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life...

The Vietnamese Ministry of Public health (MPH) recommended that nutrition patterns for the population (year 2007) is related with gender, age, and type of employment. The daily meal nominated for persons between the ages of 31-60: is for women 2.200 kcal/day and for men-2.600 kcal/day, with the average is 2.400 kcal/day. In 2003 Food energy in daily meal consumption for a person is 2.689 kcal/day, in which: rice covers 1.931 kcal/day. In general, daily energy needs are satisfied. Although, in practice because of non-uniformity between different areas, as of 2003, group food insecurity in Viet Nam was about 10.6 per cent, group with malnutrition reported at 14.4 per cent (Table-1 and Figure-1 by Vietnamese National Institute for Nutrition NIN).

Table 1- Actual and recommended daily meal energy of person (NIN, 2003)

Daily Meal	Actual , g	Supplied energy, kcal	Recommended by MPH, per cent
Rice	376	1.590 (76.8 per cent)	61-70 per cent
Cassava, potato	12	-	-
Vegetable	180	54	300 g
Fruits	72	37	-
Oil	10	88	20 g
Meat	68	246	50 g
Eggs, milk	14	20	-
Fish	52	35	83 g
Total	765	2.070	-

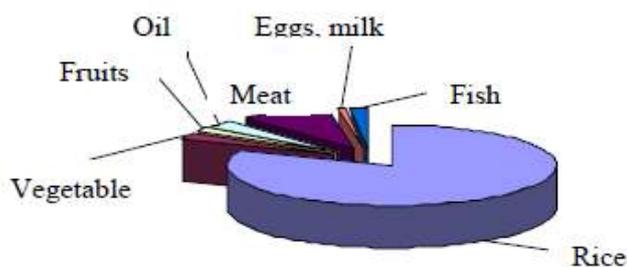


Figure 1- Proportion of daily meal nutrition

Starch (rice) plays an important role in daily meals for group people with low income, making up approximately 77 per cent of one's daily food consumption, - while portions of vegetable, oil, fish

etc. are lower. Insufficient rice production will influence directly daily meal nutrition, leading to malnutrition and food insecurity.

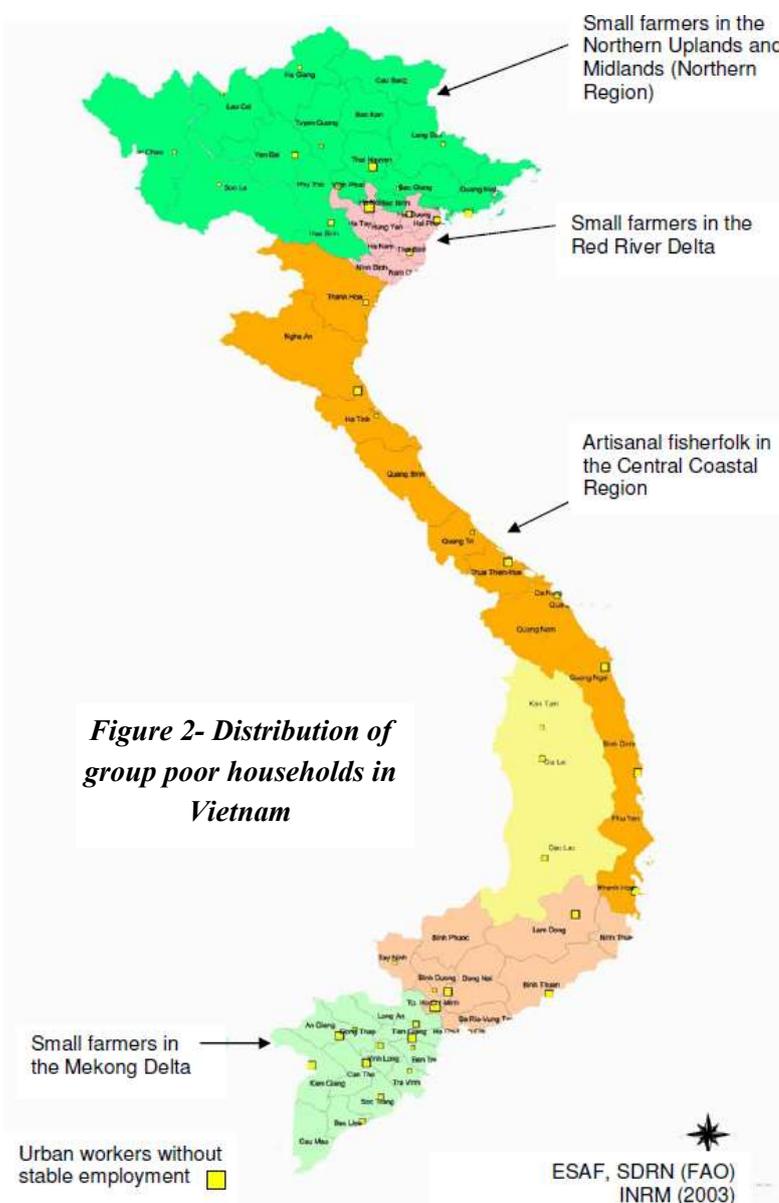
From 1998-2004, in Viet Nam the daily meal portion starts to be balanced, with decreasing averaged rice ratio consumption to 150 kg/person. Thus, down 12 per cent compared to 10 years ago. In 2001, it was 193 kg/person in rural area, and 127 kg/person in the cities. The deference is from 66 kg, decreased to 39 kg in 2002, and to 40 kg in 2004. By NIN, consumed rice/person.month has slowed from 11.9 kg/person.month (approximated 143 kg/person.year), in 2002 to only 11.3 kg/person.month (135.6 kg/person.year) in 2004. In this period, poor households in the country decreased 2 per cent (near 3 million).

III. SITUATION OF FOOD SECURITY AND SUSTAINABLE AGRICULTURE

As of 2007, rice continues to be the main crop in Viet Nam, covering more than 70 per cent of the total equivalent harvested area. Corn harvest is at: 4×10^6 ton/year, cassava - 8.000 ton/year, and sweet potato-1.500 ton/year. Recently, the generally rising trend of rice productivity slowed to 1.41 per cent /year in 2007, with total yield reaching 5 tone/ha. Natural calamity, diseases and world oil price increases have impacted rice productivity in Viet Nam. Productivity is 17 per cent higher than most Asian countries but lower than China, Korea and Japan by about 13-15 per cent.

By the most recent criteria, a poor household in Viet Nam was at 23 per cent in 2002 and 21 per cent in 2005. At the end of 2006-it is 18 per cent (5 per cent less compared to 2002), in which: 7 per cent in South, 20 per cent in Mekong delta, 21 per cent in Red river delta and in Artisanal fisherfolk the Central Coastal Region; 32 per cent in the North, 41 per cent in Central Plateau, and 54 per cent in poorer North-west areas (Figure-2).

Table-1 shows a concentration of poor households in rural areas and among ethnic minorities, as found in the 2006 Viet Nam Household Living Standards Survey (VHLSS). However, the VHLSS excludes unregistered migrants, who tend to be poorer than other urban residents and have limited access to government



sponsored social assistance schemes; it is thus highly likely that the rates of urban poverty are under-reported in the VHLSS. Yet, in urban and peri-urban areas, poor households and migrants are particularly vulnerable to higher food prices [7, 20].

Table 2- Poverty rates in Viet Nam (2006)

Sector	Poverty rate	Food poverty rate	Poverty gap
National	16.0	6.7	3.8
Urban	3.9	1.2	0.7
Rural	20.4	8.7	4.9
Kinh and Chinese	10.3	3.2	2.0
Ethnic minorities	52.3	29.2	15.4

Source: Viet Nam Development Report 2008.

In addition to the vulnerable position of those already below the poverty line to which table-2 refers, reduced purchasing power represents a substantial risk of households that had risen above the poverty line falling back below it. In this way, the sustainability of the success of Viet Nam's poverty reduction efforts over the past 20 years could quickly be undermined.

Table-3 shows facts and figures above GDP, agriculture products and poverty in Greater Mekong Subregion (GMS) countries [11, 12].

Table 3- GDP, Agriculture production and Poverty in some GMS countries

Facts and Figures	Cambodia	Lao PDR	Thailand	Viet Nam
GDP (2006) (US \$ billions) ^a	7.2	3.4	206.2	60.9
GDP per capita (2005) (US\$ PPP) ^b	2,727	2,039	8,677	3,071
Percent GDP from Agriculture (2005) (per cent) ^c	34.2	44.8	9.9	20.9
Poverty (population below US\$1 PPP per day, 2003) (per cent) ^d	34	26	2	2
Proportion of undernourished in total population (2001-2003) (per cent) ^d	33	21	21	17
Production of Cereals (2004) (1000 tons) ^e	4,426.9	2,732.5	28,276.8	39,341.4
2 Production of Cereals Share in the world (2004) (per cent) ^e	0.19	0.12	1.25	1.73
Producer Price: Rice, paddy (2006) (Local currency/tons) ^e	601,000	1,296,168	6,607	na

Source: ^a The World Bank. 2007³, ^b UNDP. 2007⁴, ^c The World Bank. 2007⁵, ^d FAO. 2008⁶, ^e FAO-STAT. 2008⁷

In 2007, total poor households lessened to 15.73 per cent, a 3 per cent reduction as compared with 2006. This is in step with the National programme for diminishing poverty-in various areas based on the target of (10-11) per cent reduction by the end of the period 2006 – 2010 (MARD).

IV. AGRICULTURAL ENGINEERING AND TECHNOLOGY FOR INCREASING CROP

Despite many challenges of natural calamities such as droughts, storms and flooding; widespread disease; and unfavorable market changes, especially those of the international market, Viet Nam tried to maintain their focus on agriculture and rural development, by issuing several new policies

to create more motivation for mobilizing internal resources, expanding the international cooperation relations, etc. Therefore, the agricultural and rural development sector could manage its remarkable development steps on a wide scale, the most notable of which are: Mechanization not only from soil-preparing, sowing, weeding, fertilizing, irrigation, spraying chemical for harvesting, and post harvesting and processing agricultural products for all types such as rice, fruit, Sugar-stick, peanuts, including mechanization in animal husbandry of pork, poultry etc....

Up to now, highest level of mechanization in thrashing: near 100 per cent, soil-preparing is 80 ÷ 85 per cent, irrigation attain 75 ÷ 86 per cent, sowing: 10 per cent v.v. Tractor range from 11 hp to 40 are commonly used in practice (Table-4)

Table 4- Range of power of engine using most in agriculture

Range of power	I			II					III
1. Engine power, kW(hp)	8 (11)	10 (14)	12 (17)	14 (19)	17 (23)	20 (27)	24 (33)	29 (40)	> 36 ≥ (50)
2. Tractive force, t	0.3 ÷ 0.4			0.5 ÷ 1.2					≥ 1.4

The rural socio-economic infrastructure has been improved and developed, especially those for irrigation/drainage, contributing to promoting production and improving the population's living conditions.

Food security should be linked closely with sustainable agricultural production. In agricultural production, water always plays the most important role, guaranteeing whether there is a good or poor crop. Traditional, Viet Nameese farmers say: "Water is first, fertilizer second, hard work third and variety forth". According to a review from the FAO, two thirds (many studies show 90 per cent) of the world's water resources coming from rivers, lakes and underground resources are used for irrigation, the rest for domestic and industrial use. In Viet Nam, agriculture now uses over 90 per cent of the total water resources available for domestic and industry, having a total surface water capacity of over 2360 rivers and lakes estimated at $850 \times 10^9 \text{ m}^3$.

Water supply and irrigation have basically met current temporary development, including in the agricultural and rural sectors. Over a long period of time, the country has invested near 250 facilities, creating more than 94,000 irrigated hectares, 150,000 drained hectares, preventing salinity intrusion for more 226,000 hectares, providing bulk water for more than 200,000 hectares, and improving quality of water supply for 1 million hectares. The total irrigation and drainage capacities by 2005 have reached 8 and 1.7 million ha of cultivated land, respectively. Building and strengthening dyke systems in 19 provinces in the North, Northern Central Coast, and supportingsimilar efforts in the central coastal provinces. The amount of excavation and earth fill works were more than 10 million m^3 , and 1000,000 m^3 of rock were used to construct bank protection works (MARD).

Recently, many farmers are raising earth-worms to treat agricultural waste, make soil more fertile, with the worm itself to be added as edibles for raising of pig, chicken, fish, tortoise, etc.

Beside the above-mentioned, balanced fertilization in relation to organic fertilizer with the correct proportions of N, P, K, Mg and other nutrients is also being concerned. Integrated nutrient

management is the efficient use of all types and forms of nutrients, both those originating from the field or farm and those from outside the field or farm.

V. FOOD SECURITY AND SUSTAINABLE AGRICULTURE-CHALLENGES

Today, the research and development of agricultural technology are facing serious challenges posed by climate change, natural disasters, sharp increase of food price in the short run, and food security and sustainability in the long run affected by increased cost of inputs to agricultural production and energy price.

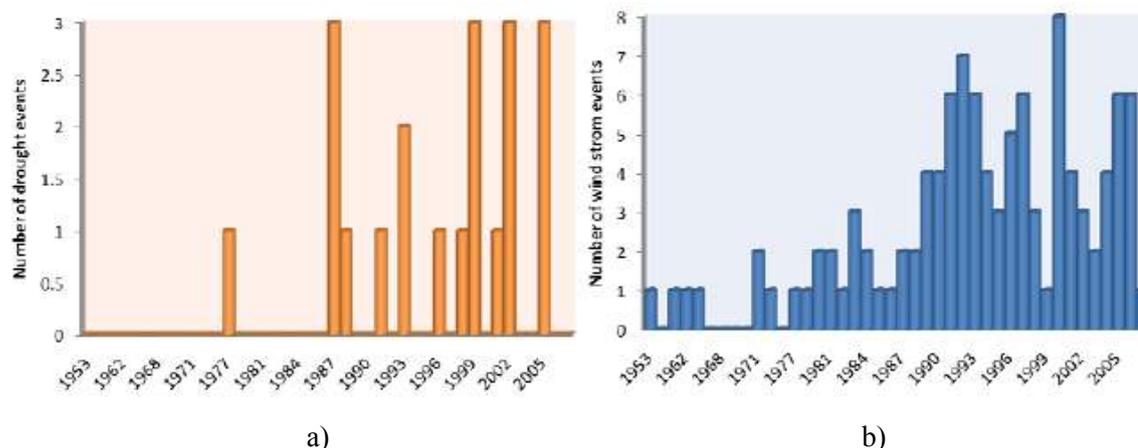


Figure 3- Frequency of drought (a), and wind storm events in GMS 2 (b)

Concerns about the impacts of climate change in agriculture and food security has intensified due to recent extreme weather events as a possible result of global warming. For instance, with little rain falling in late 2004 and early 2005, South-East Asia faced one of the worst droughts in 50 years severely impacting crop yields and availability of drinking water [18]. According to news reports, the drought cost farmers in Thailand up to US \$193.2 million after 809,000 hectares of crops were lost. Viet Nam lost US \$60 million in crops, and up to 1.3 million people did not have access to clean water. Other countries in the Mekong delta regions were similarly affected, with food shortages in Cambodia and a lack of drinkable water in Hainan, China [1, 6, 9, 11].

Various international organizations attributed these extreme weather events to global warming. In addition to rising sea level and severe tropical storms resulting salt water intrusion of agricultural land, the extreme weather events caused by global warming such as drought are already being experienced and are likely to occur more frequently in the future affecting agriculture production and food security (Figure-3).

Anticipated Impacts of Climate Change on Agriculture and Food Security

The gradual changes in climatic conditions are likely to be disruptive to food security due to loss of arable land via increased aridity and associated salinity, groundwater depletion and the rise in sea level:

- 1) Changes in the suitability of land for different types of crops and pasture due to change in distribution of agro-ecological zones.

- 2) Loss of arable land due to increased aridity and associated salinity, groundwater depletion and the rise in sea level.
- 3) Increased risks of more frequent, more widespread, and more serious flooding in low lying areas.
- 4) Loss of biodiversity and ecosystem functioning of natural habitats and change in health and productivity of forests, wetlands etc.
- 5) Changes in the distribution of good quality water for crop, livestock and inland fish production.
- 6) Threats from increasing incidence of pests and diseases, due to change in distribution of disease vectors.

Because of change in weather pattern, crops will tend to fail or become unprofitable where conditions are currently marginal for their production, while the conditions where they can be grown successfully may develop in other areas that have become marginal for other crops. Temperate crops, such as potatoes and vegetables, may be able to be cultivated at higher elevations, while crops currently confined to the lowlands may be able to be grown on slightly higher land.

Over the past 100 years, temperature data of the Greater Mekong Subregion (GMS) countries shows areas of increasing intensity e.g. in the Emerald Triangle between Cambodia, Lao PDR and Thailand and relative increase in most of Cambodia, Northeast of Thailand, southern Lao PDR, and most of central and southern Viet Nam (Figure-4) [11].

Scientists carrying out experiments at the International Rice Research Institute (IRRI) record a decline in rice yields impacted by an increase in minimum temperatures (at night). The Figure-5 shows rice growing areas in the GMS that may be affected. Analysis of weather and rice yield data from IRRI for 1979-2003 showed annual mean maximum temp increased 0.35°C and minimum temperature increased 1.13°C , rice yield declined 10 per cent for each 1°C increase in growing season minimum temperature (Figure-5). Climate scenarios of the study conducted by South-East Asia START Regional Center (SEA START) indicate that the region in general is expected to be warmer and wetter when affected by elevated atmospheric CO_2 up to 720 parts per million (ppm). The hot period of the year will extend longer and the cool period will be significantly shorter while the length of rainy season would remain the same, but with higher rainfall intensity. These changes in climate pattern will result in higher discharge of most of the Mekong River tributaries. The study suggested that the climate change in the lower Mekong River region may cause shift and change in rainy season pattern that would directly affect the rain-fed rice cultivation, which is the most important agricultural activity that involves large number of population in the region [12, 13].

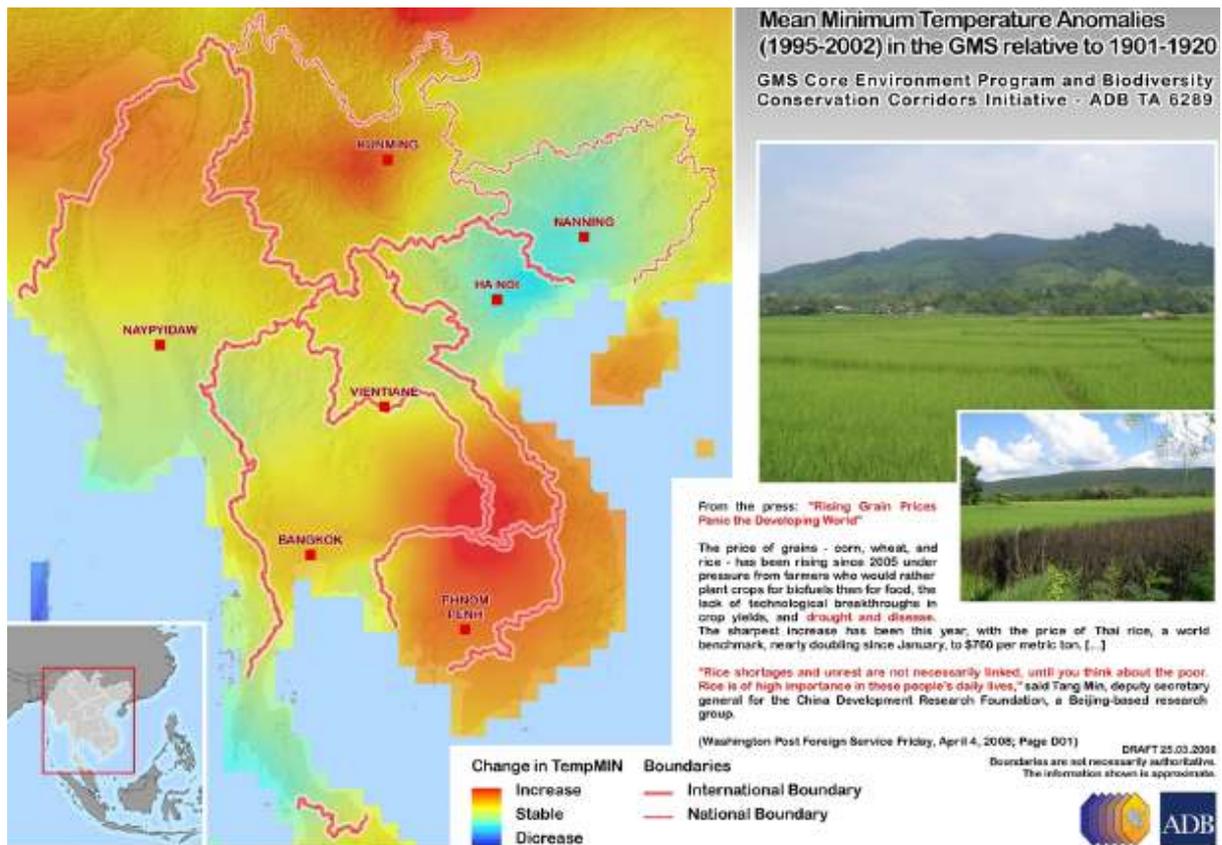


Figure 4- Mean minimum temperature change (1901-2002)

The result from simulation using crop modeling technique shows that yield of rice productivity in the study site in Thailand will increase by 3-6 per cent; but on the contrary, may reduce by almost 10 per cent in the study site in Lao PDR. The rice production in the Mekong River delta in Viet Nam tends to have severe impact from climate change, especially summer-autumn crop production, of which the yield may reduce by over 40 per cent [15].

Studies suggest that the Mekong river delta, one of the region's most important agricultural area will be the most affected due to rising sea level with 1.77 million ha of salinized land, accounting for 45 percent of the land [4, 5]. Another study suggests that the rise in sea level will increase salinity of main tributaries of Mekong as far inland as 10 km [14].

Inundation and the resulting loss of land, and saline water intrusion in the Mekong delta will pose serious threats to farmers as well as agricultural exports such as rice (of which Viet Nam is the second largest exporter in the world), and possibly to national food security (see Figure-5 for level rise inundation zone in Mekong delta) .[15].

Land is being diverted to urban/industrial uses and competition for scarce freshwater resources between agriculture and industry and residential uses also has adversely impacted the supply growth. An ADB study shows that the water available for agriculture has already declined sharply over the past several decades, particularly in Asia. Forecast for water and land use in Viet Nam is shown in Table-5 and Table-6 (MARD).

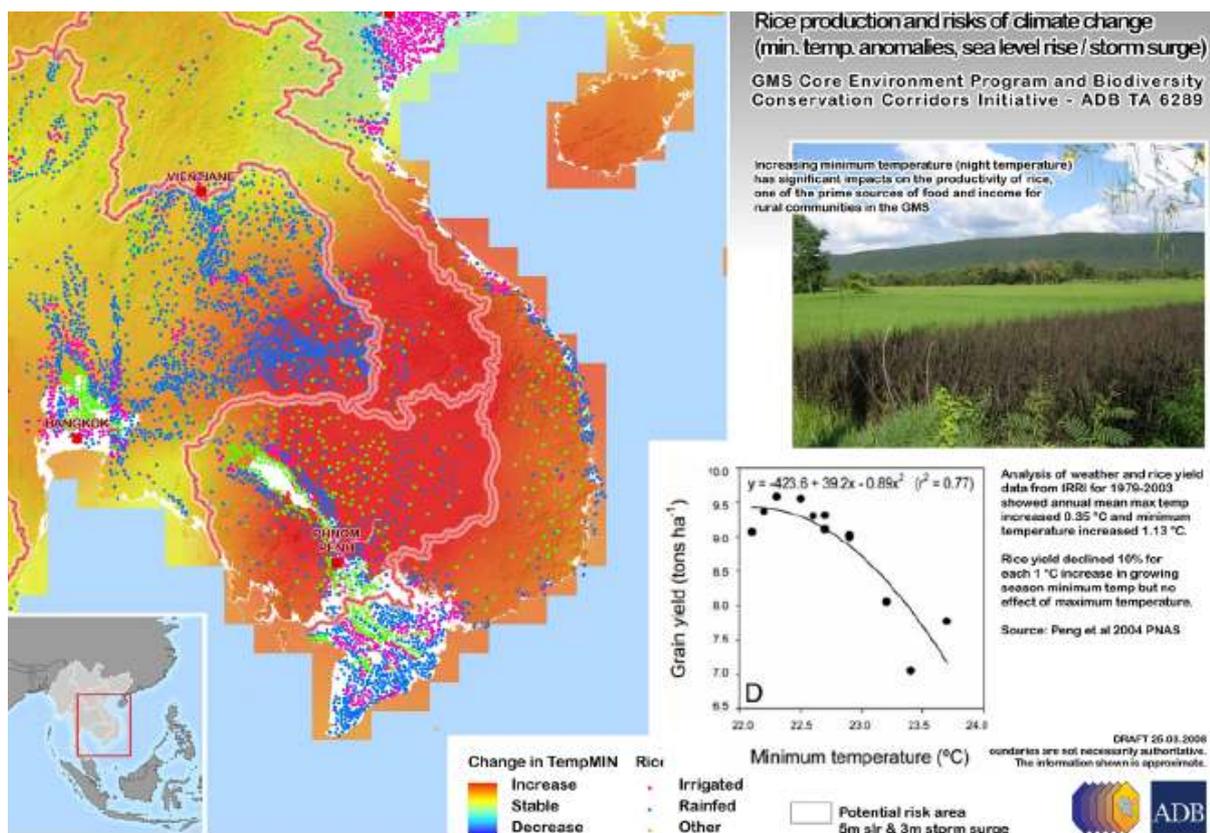


Figure 5- Rice production and risks of climate change

Water scarcity will be increasingly challenging for many of the Asian countries, in particular for Viet Nam. In the near future, by 2010, water for agricultural production in Viet Nam will still take over 80 per cent of its water. So the sustainable use and management of water is also important for national food security. The following statistics (Tables-1 and-2) show the water resource as important for agricultural development in Viet Nam.

Table 5- The situation and forecast of land use in Viet Nam by 2010

Types of land	Year		
	1995	2000	2010
Country natural land area	33,000,00	33,000,0	33,000,00
Agricultural land, ha	0	00	0
Paddy rice and other cropping, ha	7,348,500	7,790,00	9,409,600
Forestry land of all types, ha	9,500,000	0	15,900,00
Other land, ha			

Source: The strategy of management and protection of water resource in Viet Nam - The Water Resource and Hydraulic Works Department-MARD.

Table 6- Water requirement for agriculture and other economic industries by the year 2010

Sectors using water	Water requirement/year					
	1990		2000		2010	
	x10 ⁹ m ³	per	x10 ⁹ m ³	per	x10 ⁹ m ³	per
Agriculture	46,976	91	60,929	85	74,035	82
Industry and domestic use	4,659	9	10,960	15	15,918	18
Total	51,635	100	71,926	100	89,953	100

Source: The strategy of management and protection of water resource in Viet Nam - The Water Resource and Hydraulic Works Department 6/96-MARD.

Low-income countries with limited adaptive capacities to climate variability and change are faced with significant threats to food security.

Vulnerability of the poor

Climate change is an issue of concern in the GMS for the reason that, it would directly affect agriculture activity and may threaten livelihood of large number of agrarian population in the region. Agriculture employs about one third of the subregion's population. For rural economies in the GMS the additional stress imposed by climate change could threaten the goal of poverty alleviation. Much of the subregion's poverty is in rural areas and nearly all the rural poor are rice farmers. Many ethnic minorities living in and around forests and mountainous areas in the GMS are mostly dependent on subsistence agriculture for their livelihoods. Similarly, poor coastal communities are most vulnerable as they have limited adaptive capacities and are more dependent on climate-sensitive local water and food supplies.

Nearly 80 percent of Viet Nam's population lives in areas prone to seasonal flooding from monsoon rains and typhoon storms (Red River and Mekong Deltas, Central Viet Nam is not facing a shortage of food. Agricultural production is very good. But the rise in food prices has led to increased vulnerability among specific population groups and regions (particularly the North West and the Central Highlands) which are characterized by high poverty rates, poor nutrition, and which are most affected by natural disasters and resulting crop failure.

The reduced purchasing power of all households but especially the poor presents a substantial risk that households that had risen above the poverty line will fall back below it. Poorer women and children are particularly at risk since higher food prices can worsen their already precarious nutrition status. In addition, the pressure for poor households to increase earnings impacts on breastfeeding, child care, child labour, school attendance and out of pocket health expenditure.(coastal region). The central region provinces are susceptible to flash floods like those associated with tropical storms in some close years before.

Compounding the problem, Viet Nam is afflicted by 6-7, but some times up to 10 natural disasters (typhoons and floods) annually, which destroy crops and food resources, as well as seeds, fertilizers, riverside, transports and other resources in vulnerable areas (Figure-6) [5]





Figure 6- Typhoon and flood destroy crops, seeds and fertilizers, riverside collapse

Dealing with climate change will be a major challenge for Viet Nam in the next decades. Its effects may threaten the impressive economic progress the country has made. The coastal area of Viet Nam is one of the most vulnerable areas being affected by climate change. Although accounting for only 12 per cent of territory of Viet Nam, it is home to 23 per cent of the population, and would be largely inundated by a sea level rise of 1 metre in the future as an effect of climate change. Viet Nam urgently needs expertise and financial support from the international community [2].

Floods occur at lightning speed due to the narrowness of the coastal strip (the distance from mountains to the sea can be as short as 70 km), low height above sea level and very steep mountain slopes. Torrential rains can burst riverbanks in five or six hours leaving little time to predict or announce imminent floods to vulnerable communities. The frequent failure of dyke systems (river and sea) increases the area of land subjected to disasters and the number of people affected (Figure-7).



Figure 7- Typhoon and flood destroy dykes system, soil erosion, constructions and transport

Urban and rural households in Viet Nam are forced to cope with various natural calamities, which can sometimes be catastrophic. Frequent and recurring floods, typhoons and cyclones threaten the

livelihoods of small - scale and subsistence fisher families in Central Viet Nam. In the eight provinces from Quang Tri to Khan Hoa, hundreds people were killed and over a hundred thousand houses evacuated during floods in 2007. Storms regularly damage houses, boats and fishing equipment, and prevent fisher folk with non-motorized canoes and low capacity engines from going to sea. The ensuing interruption in earnings leads these households to deplete their assets or taking out a loan. Interviews conducted with people in the group of vulnerable artisanal fisher folk found that families with few assets to begin with are frequently left with nothing. The absence of insurance to cover vessels exacerbates the risk (Figure-8).



Figure 8- Typhoon and flood damage fishing equipments, houses and isolate residential area

Poor households with few economic alternatives are often dependent on dangerous or unhealthy occupations. Artisanal fishing is a risky activity and long-term insecurity results from accidents involving disability, death or loss of property. Fisher folk who cannot afford to invest in more powerful engines, safety gear or radio equipment are most at risk given their inability to monitor weather conditions or reach shore quickly when storms arise. They are also at risk of illnesses like acute respiratory infections, rheumatism and traumatic diseases after accidents. Women in these households, who fish standing for long periods in lagoons and bays throughout the year, are at high risk of gynecological infections.

Hygiene and health care levels in coastal communities are low, due to inadequate access to safe drinking water, lack of toilets and insufficient access to health services. Beaches that are used as landing sites and to sort and clean the catch also serve as public latrines and the quality of drinking water is poor. Unsanitary living conditions are also a high risk for other vulnerable people. Many poor urban workers with unstable occupations live in overcrowded slums where proper sanitation and water connections are unavailable. Proper sanitation is rare in the deltas. In the Mekong Delta, human wastes are often discharged directly into fish ponds or rivers and canals from which people draw their drinking water during the dry season.

Small and marginal farmers in the Red River and Mekong Deltas, and households living in urban slums, are also vulnerable to severe weather conditions and floods. The floods in 2008, the worst in 50 years, damaged more than 200 000 hectares of paddy crop (Figure-9)



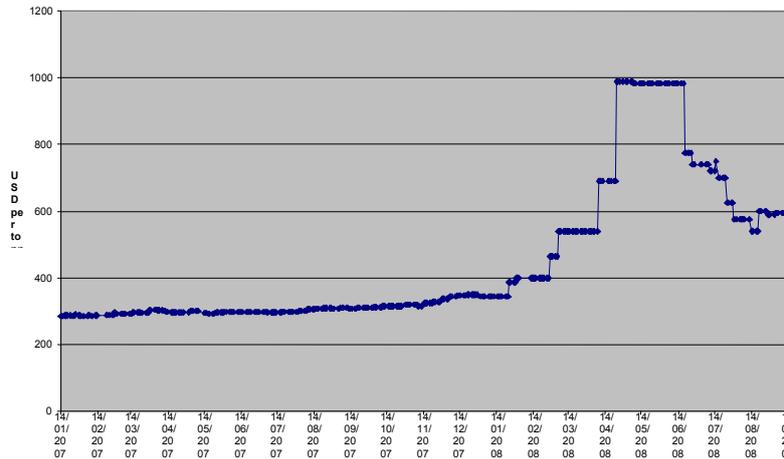
Figure 8- Typhoon and flood obstruct normal activities, take part to increase market price

In addition to the cost in human lives and livestock, flooding destroys housing, infrastructure, irrigation systems and equipment. In the Mekong Delta, families who live on the most low-lying land are regularly displaced for three months each year, with no option but to put themselves up in makeshift shelters along roads on embankments or to migrate temporarily to HCMC or more remote upland areas in An Giang and Long An Provinces.

High energy prices and energy intensity of the agricultural sector have made agricultural production more expensive by increasing the cost of critical inputs like fertilizer, fuel, and power. Both irrigation and fertilizers are critical inputs to the production of high-yielding varieties of food grains. The sharply rising energy prices and have fed into agricultural production cost and food grain prices. In 2008, despite large subsidies in Viet Nam, domestic energy prices have increased 20 – 50 per cent while fertilizer, irrigation, and transport costs have increased 30 – 50 per cent.

Globally, the UN and the World Bank signaled their opposition to the rice export ban at the time. Measures to limit international sales by the few major rice exporting countries (including Viet Nam) caused strong disruptions to the normal pattern of trade. Apart from exacerbating the tendency for prices to rise, they also resulted in a greater incidence of contract defaults by exporters and fostered an intensification of government-to-government rice deals, presumably settled at lower prices than those offered by private traders. All this led to increased market volatility.

In Viet Nam, prices peaked in June-July 2008 and then, following good harvests, prices began to stabilize and the export ban was removed in July 2008 (Figure-9). Subsequently, there has been a gradual decline in prices, which is partly explained by the inability of exporters to sell the stocks that were speculatively accumulated with the view of future price increases. Warehouses remain full and farmers in rice growing areas are unable to profitably sell their rice produce. This is undermining the financial position of many farm households, especially those that are required to repay loans that were raised for the purchase of inputs [20].



Source: GSO

Figure 10- Rice Price Fluctuations: 2007-2008

Advanced technology for bio-fuel production

The production of fuel from renewable and perhaps biological resources will contribute to reduce environmental problems and move toward more sustainable energy consumption. But it is clear that this cannot be achieved where food crops are diverted and agricultural input costs are greater than the net energy output. Production of ethanol from corn and other cereals is responsible for half of the increased demand for these crops and for the consequent increase in food prices. While bioenergy, ethanol and *Jatropha* are fashionable subjects in the current debate, it is unwise for Viet Nam to participate in light of food security and climate change issues already discussed. There is no case for a country like Viet Nam to divert its scarce resources towards energy production from agricultural land [2].

There is however limited scope for the use of crop and animal by-products for fuel production, and certainly for solar, wind and wave power. More realistic is hydro-electric and nuclear power, which has infinitely more potential to replace oil and other fossil fuels. And there is certainly scope for reduction in energy use and for greater efficiency in all aspects of human activity, including agriculture.

VI. CONCLUSION

Advantage

1- Viet Nam is a rapidly developing economy with remarkable progress in food production. However, in the past year, increases in global commodity prices including food products have posed a new set of challenges to Viet Nam's ability to maintain a path of sustainable and socially equitable growth. Given that Viet Nam is a net exporter of food, particularly rice, it might be expected that the country would benefit from higher international prices. However, this does not apply to the entire population as less than half of Viet Nameese households are net sellers of food, and many net buyers of food have not seen their incomes increase in the same proportion as food prices. The impact of higher food prices throughout the country is complex as individual households differ in their production and consumption patterns, as well as in their sources of income. Distinct regional/local differences and market volatility are evident in the current situation.

2- In addition, Viet Nam is affected by 6-7 natural disasters (typhoons and floods) annually which destroy crops and food resources, as well as seed stock, fertilizers and other resources in vulnerable areas; this requires strategies and contingency plans for disaster risk reduction and damage control at the provincial and local levels.

Challenges

Country vulnerabilities:

- Viet Nam agricultural and cultivated areas are confined compared with other countries-only 4.1 km² capita.
- According to a UNDP forecast, Viet Nam is one of five countries to face with the affects of sea level rise due to global warming, (especially in Mekong Delta and sea beach areas...)
- Decline in yields (e.g. rice) due to decrease in mean minimum temperatures will increase crop destruction / losses due to flooding;
- Increase in food prices and effect on availability of food (reduction of stockpiles);
- In-migration into higher elevations expansion / extension of agriculture on marginal soils in higher elevations need for technologies and investments (e.g. water harvesting, reducing system losses).
- The research and development of agricultural technology are facing serious challenges posed by sharp increase of food price and energy price in the short run, and food security and sustainability in the long run.

Policy

Country Responses

1. One priority should be to strengthen functional areas of government, information/data systems across the relevant government agencies, and to ensure this data is used to identify more precisely the different vulnerable segments of the population.
2. It is also important to strengthen the evidence base for an improved policy response. In the first place, specific patterns of vulnerability and the impact of higher food prices on vulnerable groups will have to be further researched and documented. In addition to this, it will be important to strengthen national information systems including for nutritional sentinel surveillance, food security and early warning, and market information. An area of priority is the need to bring together different data in a coherent, multi-sartorial analysis linking potential causal factors (policies, price trends, etc.) to actual impact on the population in general and vulnerable groups in particular.
3. In the longer term, it is necessary to ensure that the Viet Nameese agriculture and food system is capable of meeting Viet Nam's basic food security requirements in coming decades. In policy terms, this can only be achieved through a policy approach that takes into consideration the various dimensions that intervene in assuring food security along the food supply chain, and is able to incorporate policy interventions in the spheres of agricultural production, agricultural marketing and distribution, food safety and quality control, land policy, international trade, or competition policy, in a consistent and sustainable way.
4. The Government could promote a more sustainable regional trade policy including preferential arrangements for regional food imports, long term contractual arrangements with main exporters and import market guarantees. Emergency food (rice) stocks are too small and inappropriate for market stabilization, and only for localized emergencies. Above all, there is a need for appropriate and transparent information on domestic and international markets coupled with a credible consultative mechanism.
5. Advance planning for responding to anticipated climate change risks, puts emphasis on the need to adapt to the changes, such as using appropriate means and technologies in all sectors,

especially crops that need less water (such as aerobic instead of irrigated rice, and sorghum instead of maize) or varieties of existing crops resistant to heat and water stress.

6. Plan and investment in place for public campaigns, awareness raising, and disaster preparedness by local authorities/interest groups/associations/schools, and raise awareness among younger generations, preparing them for possible future challenges;

7. Greater emphasis on disaster preparedness, managing in-migration into areas of higher elevation, and the educational curriculum in schools being amended/adapted to inculcate information about anticipated risks.

8. Development planning and finance in GMS and other countries, work with organizations such as UN agencies, such as the FAO, development partners, multilateral banks, private sector financial institutions in planning for large scale investments in adaptation measures such as ensure accurate and timely prediction/ forecasting to reduce high risk and damage from anticipated climate change impacts.

9. In the longer term, it is necessary to ensure that Vietnamese agriculture and food system is capable of meeting Viet Nam's basic food security requirements in coming decades. In policy terms, this can only be achieved through a policy approach that takes into consideration the various dimensions that intervene in assuring food security along the food supply chain, and is able to incorporate policy interventions in the spheres of agricultural production, agricultural marketing and distribution, food safety and quality control, land policy, international trade, or competition policy, in a consistent and sustainable way.

10. The Government could promote a more sustainable regional trade policy including preferential arrangements for regional food imports, long term contractual arrangements with main exporters and import market guarantees. Emergency food (rice) stocks are too small and inappropriate for market stabilization, and only for localized emergencies. Above all, there is a need for appropriate and transparent information on domestic and international markets coupled with a credible consultative mechanism.

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