# Food Security Perspectives: Focus on Asia and the Philippines

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## Introduction

The world today has the capacity to produce more food than it can consume. The situation is envisioned to prevail if resource base is made sustainable, science continues to raise crop productivity, and national and international policy environment enable food producers to achieve efficiency, equity, and sustainability. However, millions of the poor still are unable to partake of the abundance of food supply. In recognition of this irony, the 1996 Rome Declaration states that food security exists 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 irony of hunger coexisting with adequate food supply is most pronounced among low income countries. The situation is most dire where local agroenvironments are unfavorable for ample food production. For developing countries in Asia where agroenvironments favor verdant agriculture, the food security issue is a continuum of adequate food production, stable food supply and access of every household to food bundles of proper nutrition at all times.

Sustainable food production systems ensure adequate and supply while adequate distribution and purchasing power of consumers ensure unfettered access. Rich consumers may access food from producers across oceans or continents. World trade today facilitates this form of access. Also, current world view still ignores externalities of food trade arising from energy consumption and transportation. But the primary concern here is food security of the lower income countries whose bulk of population depends on agriculture, such as that obtaining in most countries of Asia.

The agriculture sector across Asia propelled the region to be the world's leader in agricultural growth in the 1990s from a bottom position since the 1960s. Highlighting this achievement is the fact that agricultural growth surpassed population growth. Some countries performed well in agriculture, along with services and industry, and achieved impressive economic growth. On Asia's feat in agriculture comes a vital question: Is agricultural growth enabling the rural populace to have access to adequate food?

Subjecting national food systems to the globalization now poses new challenges and dilemmas to shaping food security policies at the national and international levels. The freer flow of foodstuff across countries present potential economic gains in terms of widening the food supply pool and driving consumer prices down. At the same time, there are important considerations that have to be dealt with in a nation's attempt to establish the desired balance between domestic food production and importation abroad.

Nations whose smallholders and farm workers largely constitute the rural poor, bear the irony of watching their food producers suffer malnutrition. Here, food security narrows down to the staple food and defines a local continuum of production and consumption, i.e., self-sufficiency in staple food. The ordinary rice-eating Asian thinks of food security as rice security. Other food crops naturally complement people's nutrition; hence, subsequent mention of farmers does not necessarily mean rice farmer.

Under favorable agroenvironments, food insecurity among food producers indicates institutional defects and low productivity of farmers. Smallholders and farm workers should be enabled to produce more food and operate sustainable farm systems that generate yearlong incomes. This means access to land, services, knowledge, and skills to enable them to diversify income and increase their purchasing power. Human and social capital are built up by economic structures and policies and action programs. At the national level, these are measures that enhance equity and efficiency and effect poverty reduction. These are especially crucial at a time when the food markets of the developing countries are exposed to the vagaries of international markets through freer trade. Also, economic goals today cannot ignore environmental degradation for reasons of sustainability. These diverse but food security-related issues are addressed in the paper.

To situate the Asian region among global considerations Part I presents the global food supply and distribution and tackles the issue of food insecurity in developing countries. Part II examines market forces and international regimes as they affect food security of developing countries and the Philippines in particular. Part III deals with domestic dimensions - the socioeconomic environment and the farmer's quest for sustainability. Part IV focuses on coping with food insecurity and attendant problems.

## Part 1. Global food supply and distribution: Empirical dimensions

This paper begins by looking at two sets of trends to ascertain the nature of global food scarcity. The first has to do with food production and how it has kept pace with population growth. The second has to do with the movement of real food prices which indicates how global supply is keeping pace with demand. It then verifies how these food availability indicators compare with some food consumption statistics.

Grain production outpaced population changes in the seventies**C** a trend that heightened in the eighties but appear to have reversed in the first five years of the nineties. (Table 1) Throughout the seventies, change in production has been greater than change in population in practically all parts of the world except South America and Africa. The African situation improved in the eighties**C** as with the rest of the world except South America. The dramatic increases in South American cereal sector productivity only bore fruit in the nineties when it was the only region in the world where change in production

outpaced change in population.

*Table 1. Average annual percentage change in production and population: 1971-1995*

| Area | Average annual % change in production | | | Average annual % change in population | | | Average annual share in world production | | | Average annual share in world population | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1971-80 | 1981-90 | 1991-95 | 1971-80 | 1981-90 | 1991-95 | 1971-80 | 1981-90 | 1991-95 | 1971-80 | 1981-90 | 1991-95 |
| **by continent** | | | | | | | | | | | | |
| N. America | 4.43 | 4.52 | -0.19 | 0.97 | 1.01 | 1.02 | 20.55 | 20.76 | 20.95 | 5.95 | 5.90 | 5.85 |
| S. America | 1.95 | 1.23 | 6.15 | 2.31 | 1.99 | 1.63 | 4.21 | 4.25 | 4.32 | 5.20 | 5.31 | 5.33 |
| Europe | 3.66 | 1.26 | -0.67 | 0.52 | 0.33 | 0.25 | 16.30 | 16.20 | 16.02 | 11.53 | 11.38 | 11.23 |
| Africa | 2.22 | 3.11 | 2.43 | 2.71 | 2.84 | 2.71 | 4.75 | 4.72 | 4.65 | 10.23 | 10.33 | 10.43 |
| Oceania | 6.39 | 9.02 | 10.27 | 1.62 | 1.54 | 1.39 | 1.27 | 1.30 | 1.30 | 0.52 | 0.52 | 0.52 |
| Asia | 2.81 | 3.34 | 1.36 | 2.10 | 1.89 | 1.98 | 39.16 | 39.41 | 39.60 | 57.67 | 57.80 | 57.91 |
| World | 2.76 | 3.44 | 0.45 | 1.85 | 1.74 | 1.49 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| **by economic group** | | | | | | | | | | | | |
| Industrial | 3.64 | 2.54 | -1.07 | 0.81 | 0.68 | 0.69 | 47.62 | 47.93 | 48.20 | 18.58 | 18.39 | 18.20 |
| Developed | 2.89 | 2.03 | 3.05 | 0.83 | 0.70 | 0.51 | 34.35 | 34.47 | 34.47 | 27.54 | 27.26 | 27.00 |
| Developing | 2.74 | 3.12 | 1.76 | 2.25 | 2.08 | 1.79 | 52.38 | 52.07 | 51.80 | 72.46 | 72.74 | 73.00 |
| LDC | 2.76 | 3.43 | 1.68 | 2.54 | 2.50 | 2.61 | 33.79 | 33.98 | 34.15 | 8.63 | 8.69 | 8.76 |
| LIFD | 2.86 | 3.46 | 1.40 | 2.16 | 2.02 | 1.97 | 36.59 | 36.82 | 37.02 | 52.84 | 53.00 | 53.14 |

Basic Source: FAO, 1997

According to FAO a considerable increase in plant production between 1970 and 1990 was due to increased productivity and improved yields and to a lesser extent, to an increase in cultivated area. The slowing of grain production in the nineties, on the other hand, is attributed to the exhaustion of the potential of existing land being cultivated.

The role of productivity in boosting production between 1970 and 1990 is mirrored by the trends in average annual percentage change in productivity. (Table 2) Between 1971 and 1990, productivity growth was rising for all of the economic groups and all of the continental groups except Europe and Africa. The first half of the nineties, in contrast, is characterized by the slowing down in annual productivity increases except in South America.

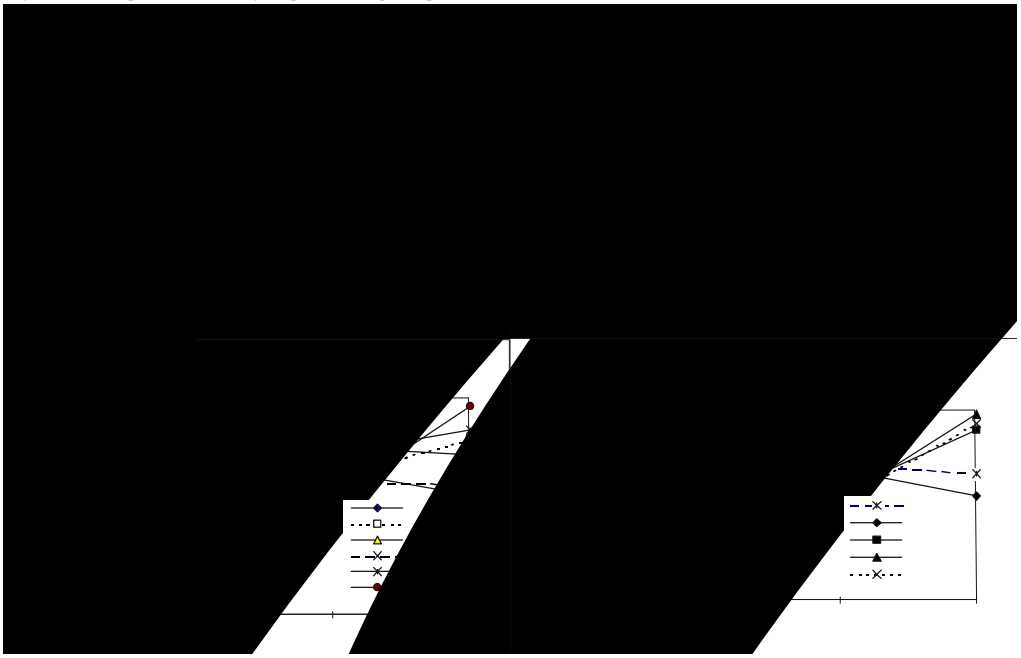
Despite this apparent slowing in cereal production, food production and food production per capita indices continue to be on a general upswing for most of the developing world. (Figure 1) The important exception is Africa where, given the primacy of roots and tubers in its diet, production statistics pertaining to cereals may not be as important as per capita food production index. Food production and per capita food production indices in North America and Europe in 1995 fell, compared to their position in 1985, to points approximating their 1975 positions. The decline for developed countries however, bear minimal impact to their populations in as much as their supplies still increasingly exceed their energy requirements. In Northern America, for instance, food supply exceeds energy requirements by almost 50 percent. (FAO, 1996) Per capita indices follow the direction of food production indices when countries are grouped according to their economic classification. However, continental grouping point to dramatic increases only happening in

Asia and to a lesser extent, South America.

The situation in terms of energy requirement coverage has vastly improved over the last forty years. The improvement is most noticeable in Asia where the coverage rate of energy requirements went from a deficit of 6 percent in 1962 to a surplus of 17 percent in 1990. (FAO, 1996)

Trends and projections based on World Bank data suggest that the real price of food relative to industrial commodities have been on a downward trend throughout this century, declining at about 0.5 percent every year. This implies that the global capacity to supply food has grown slightly more rapidly than global demand. The latest projections by the World Bank point to the continuation of this broadly balanced growth with real prices in 2005 lower than those prevailing in the first half of the 1990s. (Anderson, et. al., 1996)

*Figure 1. Food production and food production per capita indices: 1965-1995*



Basic Source: FAO, 1997

However, there has been a spate of nominal increases in cereal prices in the nineties. As with the slowing of cereal production, this has not gone unnoticed. The optimistic picture painted by the trends in production, population growth and real prices prior to the nineties, is offset by the Malthusian warnings of Brown (1995). Brown projects that given expected declines in land and water availability for grain production in China, China would be needing more than 200 million metric tons of grain imports by year 2030, a volume roughly equaling the current volume of global international trade in grain.

*Table 3. Grain self-sufficiency, various regions: Actual 1989-1991 and projected 2010*

| | Actual 1989-91 | Projected 2010, WB | Projected 2010, IFPRI | Projected 2010, FAO |
|---|---|---|---|---|
| Advanced economies | 128 | 136 | 124 | 128 |
| Eastern Europe & former Soviet Union | 88 | 105 | 102 | 102 |
| All developing economies | 91 | 86 | 88 | 89 |
| East Asia | 94 | 91 | 94 | 95 |
| South Asia | 100 | 90 | 97 | 97 |
| Latin America | 87 | 84 | 92 | 86 |
| Sub-Saharan Africa | 86 | 86 | 73 | 85 |
| Middle East & North Africa | 67 | 57 | 64 | 62 |

Source: World Bank from Mitchell and Ingco (1995), FAO from Alexandratos (1995) and IFPRI from Agcaoili and Rosegrant (1995) cited in Anderson, et. al. (1996)

Three studies done independently by World Bank, FAO and IFPRI**C** all taking into consideration concerns about land degradation, the conversion of agricultural land to industrial uses and the limits to the expansion of irrigation**C** are far less pessimistic in their expectations of the capacity of producers, consumers and policy makers to respond appropriately to resource and environmental challenges. (Table 3) Small changes in grain self sufficiency are projected and the studies suggest that developing countries (including China), as a group would be importing only around 190 metric tons from advanced industrial economies in 2010, doubling the volume of the early 1990**:**s. (Anderson, et. al., 1996)

*Table 4. Estimates of food energy deficiency in developing regions*

| Region | Period | % of food-energy-deficient persons in population | Number of food-energy-deficient persons (in millions) |
|---|---|---|---|
| Inter-tropical Africa | 1969-71 | 38 | 103 |
| | 1979-81 | 41 | 148 |
| | 1990-92 | 43 | 215 |
| Near East & North Africa | 1969-71 | 27 | 48 |
| | 1979-81 | 12 | 27 |
| | 1990-92 | 12 | 37 |
| East Asia & Southeast Asia | 1969-71 | 41 | 476 |
| | 1979-81 | 27 | 379 |
| | 1990-92 | 16 | 269 |
| South Asia | 1969-71 | 33 | 238 |
| | 1979-81 | 34 | 303 |
| | 1990-92 | 22 | 255 |
| Latin America & Caribbean | 1969-71 | 19 | 53 |
| | 1979-81 | 14 | 48 |
| | 1990-92 | 15 | 64 |

Source: FAO 6th World Food Survey (1996) cited in FAO (1996)

Has the availability of food translated to food security at the national and household levels? It has to the extent that the proportion of population who are food-deficient has been declining in all developing regions except Inter-tropical Africa. (Table 4)

However, the absolute number of the hungry has also risen by as much as 17 percent between 1980 and 1992. While the proportion is expected to decline over the coming years, the absolute number of the hungry is expected to rise continuously. In 1992, 841 million people were deemed energy deficient**C** a figure comprising 20 percent of the

developing countries: population. The situation is most dire in the least developed countries where, despite an increase in global availability, per caput fat supply has risen only minimally, dietary energy supply has stagnated, and per caput protein supply has even declined. (Tables 5a and 5b)

What are the most salient insights to be gleaned from the above empirical trends?

First, food security continues to be a developmental problem and poverty remains to be the single most important obstacle to ensuring it at the national and household levels. The relative improvement in the performance of developing Asia compared to developing Africa in both production- and, more importantly, consumption-side statistics point to the close relationship between economic development and the alleviation of hunger.

Second, in view of continuing population growth, increasing land scarcity and mounting difficulties in achieving sustainable increases in food-crop yields, technological innovation remains a cornerstone in achieving long-run stability in food supply. For developing countries, the role of public investment in research and development cannot be understated as with the importance of institutions, infrastructure and development of human resources in democratizing access to new technologies.

Third, an increased involvement in international food trade is bound to be an important feature of the policy environment towards attaining food security goals. In a globalized food system, the fiscal capacity of nations to finance their food imports becomes a central issue. In developing countries where food producers are among to the most food-insecure sectors, exposing their food market to the vagaries of international trade pose new opportunities and challenges.

## Part 2. International dimensions of food security - market forces, international regimes and the Philippine case

Trends in food trade balances point to the increased dependence of developing countries on food imports. (Table 1) Even as current levels of imports represent a minimal proportion of total consumption, the degree of dependence of developing countries on the international market, especially for grains, is expected to deepen. Rising income, especially in developing Asia, is expected to spur demand for both food and feed grains that may not necessarily be fulfilled by local production. World Bank estimates that the developing countries: share in world food grains imports would reach 70 percent by the year 2000. It also estimates that Asia would be dependent on the world market for at least (?) percent of its grain requirements by year 2005.

*Table 1. Net trade balance in food: 1965-1995*

| | 1965 | 1975 | 1985 | 1995 |
|---|---|---|---|---|
| Industrial | (1,313,600) | 32,250,800 | 87,876,500 | 106,684,000 |
| Developed | (8,091,100) | 15,294,000 | 40,766,000 | 106,323,800 |
| Developing economies | 13,142,870 | (11,555,660) | (42,023,000) | (92,239,200) |
| Developing Africa | 3,272,740 | (6,080,880) | (28,419,500) | (29,764,760) |
| Developing Asia | (14,103,880) | (24,851,630) | (43,482,990) | (84,002,210) |
| LDC | 4,809,715 | (484,904) | (8,283,125) | (7,761,420) |
| LIFD | 1,521,860 | (7,735,540) | (24,081,360) | (64,612,050) |
| Transition economies | | | | |

Basic Source: FAO, 1997

Trends also suggest the dominant role of the developed world, despite falling rates of productivity and production, as international trade net food suppliers– a role that, if various projections are to be believed, it is unlikely to relinquish. World Bank envisages the developing countries' share in world cereals exports to increase from 12.7 percent in 1987 to only 14.4 percent by 2000. Both FAO and the World Bank posit that Argentina and Thailand are likely to remain the only significant Third World suppliers of cereals. OECD countries, in contrast, are likely to increase their exports because these countries are said have the ecological, technological and structural capacity to meet rising export demands. (Brown and Goldin, 1992)

The projected deepening of dependence of developing countries on the developed world for its food needs has consequences that go beyond the question of food balances. The shift towards greater world trade, mainly involving developed countries' exports to food deficit developing countries, raises issues about (1) food self-sufficiency objectives; (2) implications on small holder production of exposing national food systems to competition and (3) the fiscal ability of net importers to finance their imports.

The pursuit of food self-sufficiency is a national policy reaction to the inherent instability of global food market. This was the dominant policy approach to food security during the early seventies in the face of sharp increases in world food prices. But the US and the EU are also known to have pursued this principle in protecting their food systems. To the extent that increased reliance in food trade may undermine national efforts and incentives for enhanced local production, the increased dependence on global trade for food supplies is seen as detrimental to self-sufficiency objectives. World Bank argues that national self-sufficiency is not essential for food security. It contends that self-sufficiency in tradable foods sector is efficient only when a country has a comparative advantage in producing it. (WB, 1986) The contrary view is that the inherent instability of the international food market has not waned and that on top of this, there exists a potentially hostile geo-political international environment where food can be used as an instrument for leveraging and an object of blockade to force submission (Putzel, 1996) The advocacy for national self-sufficiency in staple grains is usually couched in these terms.

Another developing country concern related to the increased influx of imported food is the potential livelihood losses in sectors directly competing with food imports. The mechanized and subsidized food systems of the north bear little semblance to the predominantly small-holder production of the south. For the latter to be able to compete in the global arena, big strides will have to be made by developing countries in terms of technological breakthroughs in increasing and sustaining productivity, human resource development, and agricultural infrastructural support. The dislocation meanwhile bears serious implications for the poverty-reduction efforts of low-income countries where

agricultural production accounts for some two-thirds of employment. This argument is usually assumed away in cases where the poor are net buyers of food**C** here increasing national food supplies through relatively cheaper food imports may render net economic welfare gains. However these gains are only possible if the welfare losses of producers are properly compensated. Safety nets as compensating mechanisms become an important policy concern.

As developing countries become more reliant on the international food market, their capacity to finance imports becomes a major factor in ensuring food supply for their population. The sustainability and source of their foreign exchange revenues determine the kind of strain on the balance of payments that increased food imports will impose. Here, the interplay between food security objectives and economic growth are underscored.

**the gatt-ur agreement and agricultural trade liberalization**

The policy environment at the international level facilitates international trade and the increased integration of the world food system. The signing of the General Agreement on Tariff and Trade Uruguay Round (GATT-UR) in 1994 represents an important epoch for many developing countries which have long protected their food sectors from the vagaries of international trade. The GATT-UR marks a watershed in that agricultural trade has hitherto escaped previous GATT rounds.

*Table 2. Key features of the GATT-UR*

| | |
|---|---|
| | reduction of trade distorting subsidies equal to 20 percent of AMS, using 1986-1988 as the reference period<br>remarks: provision does not apply where AMS does not exceed 5 percent of the total value of agricultural production for developed countries and 10 percent for developing countries |
| | for developed countries, reduction of export subsidies by 21 percent for each product from it 1986-1990 average<br>for developed countries, reduction of budgetary expenditure on export subsidies by 36 percent over six years<br>for developing countries, reduction by two thirds of the above figures over 10 years<br>remarks: food aid and unsubsidized exports exempted |
| | for developed countries, tariffication of all import restrictions and reduction by 36 percent<br>for developing countries, reduction for each tariff line by at least 15 percent over six years, increasing to 24 percent over ten years<br>for developing countries, introduction of minimum access requirements beginning at 3 percent of domestic consumption and rising to 5 percent by the end of the agreement<br>remarks: under certain conditions, developing countries exempt from tarrification commitment where primary staples are concerned |

Source: Watkins (1992)

The GATT-UR was launched in 1986 at a time when developed country agricultural price support systems had generated unprecedented levels of surplus production. It was envisaged that market liberalization under GATT would bring down the distortions

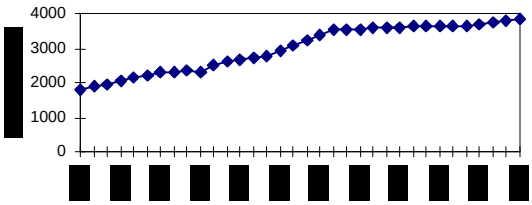
brought about by such systems. The key features of said agreement thus revolve around the reduction of price support and more open trade rules. (Table 2) Such market-oriented approach to agricultural policy reform was expected not only to police international trade tensions but more importantly, to bring international production back in line with demand. What are the implications of the agreement on developing countries food trade and security interests? The paper answers this question by looking into the experience of the Philippines.

**the philippine case**

In 1994, the Philippine government concurred with the General Agreement on Tariffs and Trade Uruguay Round (GATT-UR) treaty and in so doing set the stage for liberalizing the importation of a wide range of agricultural commodities including foodstuff. The expected influx of food imports as a result of the treaty's ratification has become a crucial emotional issue in the ensuing debate, coming as it at a time of very weak performance of the agricultural sector.

In the sixties and the seventies, the Philippines' agricultural sector registered the highest growth rate among the developing Asian countries. In the eighties and early nineties, it registered the worst performance. (Table 3) The trends in growth rates of rice, corn, sugarcane and coconut, the four most important crops of the Philippines, are telling. (Table 4) While sugarcane enjoyed a surge in the late eighties due to conducive world prices, the rest went through a growth slump from the eighties onwards. In the same period the poultry and livestock and to some extent, the fisheries sectors, became the major sources of growth of the beleaguered agricultural sector.

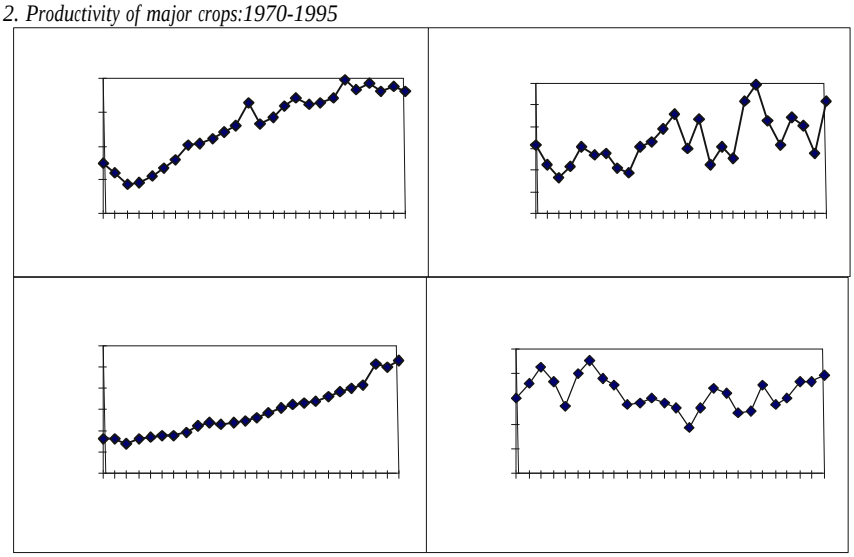
*Figure 1. Area planted to permanent crops*




Other trends paint a dismal picture in terms of the sector's ability to supply the needs of a burgeoning population. Trends suggest that the agricultural frontier may already have been reached as the expansion of permanent crop hectarages stagnated in the eighties. (Figure 1) Much of the stagnation in the nineties reflects the uncertainty in property rights due the unsuccessful implementation of agrarian reform and the resultant conversion of farm lands to non-agricultural uses. (Lim, 1996) Although productivity in major crops have generally been on the upswing since the seventies, there have been worrisome movement since the eighties. (Figure 2) Rice yields growth was fastest in the seventies as a result of the introduction of green

revolution. They have relatively stagnated since the mid-eighties although the levels are currently still in pace with yield levels in most Asian countries except China and Indonesia. Corn yields, on the other hand, grew fastest in the eighties with the introduction of high-yielding yellow feed corn varieties but still among the lowest in Asia. Meanwhile, coconut yields have not recovered its yield levels in the late seventies and have largely deteriorated since then.

*Figure 2. Productivity of major crops:1970-1995*



Source: FAO, 1997

These trends, along with declining agricultural relative prices, have led to the decline in agricultural output and its relative importance in national output. However, the sector continues to be the single most important source of livelihood for a large portion of the population. (Table 5)

The liberalization of the agricultural sector by way of GATT-UR thus presents a dilemma of the following nature. On one hand, there is a need to consider the liberalization of food imports in the face of the reaching of the agricultural frontier and the bleak prospects for the sector to catch up with population growth and demand. On the other hand, given the extent of population dependent on the agricultural sector, especially in corn and rice, any major displacement brought about by the structurally deficient agricultural sector=s inability to compete in the global market cannot be trifled with. (Lim, 1996)

By how much will GATT-UR measures open the Philippine agricultural sector? The tariff rates committed by the Philippine government are generally above the tariff levels prior to the ratification. (Table 6) Minimum access volumes in rice and corn represent a minimal amount of consumption and past levels of imports. Much of the threat, however, stems from how the implementation guidelines allows for increasing these volumes, sans

consultations with the producers, whenever there is a perceived shortage in corn and rice (i.e. projected price is more than the border price by a rate equal to the average of the out-quota and in-quota tariff). [1]

*Table 6. Philippine agricultural concessions to the UR agreement*

| | | Bound rate | | Minimum access volume 1995 | | Minimum access volume 2004 | |
|---|---|---|---|---|---|---|---|
| Commodity | Tariff rate 1995 | Initial, 1995 | Final, 2004 | Quantity (in MT) | % of consumption | Quantity (in MT) | % of consumption |
| Rice | 50 | N | N | 59,730 | 1.0 | 238,940 | 3.9 |
| Corn | 20 | 100 | 50 | 130,160 | 9.3 | 216,940 | 15.4 |
| Coconut | 50 | 70 | 40-60 | N | | N | |
| Sugar | 50 | 70-100 | 50 | 38,000 | 0.2 | 64,000 | 0.3 |
| Garlic | 30 | 100 | 40 | 451 | 4.4 | 751 | 7.4 |
| Onion | 30 | 50-100 | 40 | 1,610 | 3.6 | 2,683 | 6.0 |
| Cabbage | 30 | 100 | 40 | 2,106 | 2.7 | 3,509 | 4.4 |
| Potato | 30 | 50-100 | 40 | 1,457 | 2.3 | 2,429 | 3.8 |
| Coffee | 30-50 | 100 | 40-50 | 4,273 | 3.7 | 7,122 | 6.2 |
| Beef, live | 3-30 | 10-100 | 5-40 | 5,600 | 36.5 | 87,667 | 60.9 |
| Beef, chilled | | | | 52,600 | 36.5 | 87,667 | 60.9 |
| Dairy | 10-30 | 30-50 | 20-40 | N | | N | |
| Pork | 3-30 | 10-100 | 5-40 | | | | |
| Poultry | 3-30 | 10-100 | 3-40 | | | 346,720 | |
| Cotton | 5 | 10-200 | 5-10 | N | | N | |
| Cassava | 30 | 50 | 40 | N | | N | |
| Seaweeds | 10-20 | 30-40 | 20-30 | N | | N | |
| Shrimps & prawns | 30 | N | N | N | | N | |
| Tuna | 10-30 | N | N | N | | N | |
| Asparagus | 30 | 50 | 40 | N | | N | |
| Papaya | 50 | 50 | 40 | N | | N | |
| Pomelo | 50 | 50 | 40 | N | | N | |
| Maguey | 3 | N | N | N | | N | |
| Abaca | 10 | N | N | N | | N | |
| Salago | 10 | N | N | N | | N | |
| Tobacco | 20-50 | 40-70 | 30-50 | N | | N | |
| Banana | 50 | 70 | 50 | N | | N | |
| Durian | 30 | 50 | 40 | N | | N | |
| Pili | 30 | 50 | 40 | N | | N | |

AN@ connotes no commitment
Source: Balisacan, 1995 cited in Lim (1996)

[1] The implementing guidelines of the MAV stand among the most criticized aspects of the agreement. Even as it is touted to be a Afreer market@ mechanism, its logic is not governed at all by free market principles. David (1996) cites how the guidelines tend to counter the spirit of tariffication in as much as (a) access to imports under MAV are not bidded out but are based on historical market shares in the intial year ergo quota rents will accrue to those granted access; (b) whenever there is a perceived shortage as described in the introduction of this paper, MAV will be increased but the increase will have to be approved by congress; (c) NFA is both an MAV consolidator and a member of the MAV management team thus it can provide indirect pressure for importation to be coursed through it; and (d) all revenues derived from MAV in-quota tariff duties are earmarked by congress for rural infrastructure, research and development program proposals coming from the private sector including agricultural and agri-business groups representing the producers of commodities where QRs have been lifted.

However, the liberalization of the Philippine agricultural sector must be appreciated in the context of the economy-wide deregulatory framework, the regional trade agreements that the Philippines has entered into and the agricultural modernization program.

In the eighties, the government embarked on economy-wide and sector-specific reforms under the auspices of the World Bank=s structural adjustment programs meant to improve economic efficiency, increase growth and minimize fluctuations in price levels (Clarete, 1995). These reforms were also meant to correct the inherent bias of trade policies for industry and against agriculture. They included:

trade policy reforms to remove quantitative restrictions, to lower average and limited dispersion of tariffs, to eliminate implicit and explicit taxes on traditional exports and to abolish price controls on food and other essential consumer goods;

liberalization of regulations on foreign investments; financial liberalization including the decontrol of interest rates and more liberal banking regulations;

tax policy reforms to minimize inefficiencies and inequities in the tax structure, improve tax administration and raise tax revenues; and

privatization to shift resources from the government to the private sectors; and currency devaluation to reduce the deficit in the balance of payments. (Clarete,1992)

The Tariff Reform Program was introduced in 1981, carrying out comprehensive tariff reductions in batches of five years. *Between 1981 to 1985*, the number and spread of tariff categories were limited. Tariff rates above 50 percent were abolished, and tariff items were clustered around 10, 20, 30 and 50 percent. *From 1986 to 1990*, tariffs on products whose quantitative restrictions were tariffied were adjusted. *In the period 1991-1995*, tariff clusters were adjusted further to 3, 10, 20 and 30 percent. In this period, average tariff in agriculture declined by 27 percent. Tariffs on capital equipment, textiles, garments and their chemical inputs and ther non-agricultural products were further lowered.

By the turn of the century, the TRP envisions to limit clusters to just 3, 10 and 20 percent with the exception of agricultural products whose QR=s have been tariffied. The spread is expected to be further limited to only two categories: 3 and 10 percent by 2003 and 3 and 5 percent by 2004. These goals fall well within, if not well in advance of and beyond, the commitments called for not only by the GATT-UR but also the ASEAN Free Trade Agreement (AFTA) and the Asia Pacific Economic Cooperation (APEC). For example, efforts are now underway to get rice and corn off the exclusion list of the Common Effective Preferential Tariff (CEPT).

It has been said that the GATT-UR binds the Philippine government=s liberalization program within an international framework. But it is also clear that the TRP is by far even more ambitious than the treaty.

The Medium Term Agricultural Development Plan also provides impetus to the

accelerated deregulation of the agricultural sector. Part of the incumbent president Fidel Ramos= ballyhooed Philippines 2000 program envisioned to propel the country towards Asian tiger growth rates, MTADP aims to (1) reduce by more than half the land currently cultivated to corn and rice and (2) convert freed up land for diversification to livestock and commercial crops, sectors being propped up for their potentials in the export market. To meet the country=s food requirements, unprecedented growths in staple crop yields are being targeted. In corn for instance, the program is targeting tripling productivity rates before the end of the decade. The philosophy is to herd production where it is most efficient.

The failure of the government to address long standing problems in the rural sector in relation to agrarian reform, public investments in infrastructure and research and development render suspect the agricultural sector=s ability to meet the productivity targets set by the program. Nowhere is the failure more glaring than in the budgetary allocation government sets aside for agriculture.

Public expenditures in agriculture went through a brief period of recovery in the late eighties after bearing the brunt of contractionary policies in the seventies. This quickly tapered off in the nineties, with the share of expenditures in agriculture standing at a measly 4.5 percent in 1995. (Table 7) A review of how this budget was allocated shows that a large chunk went to natural resources and environmental management, rehabilitation of forest and fishery resources; as well as to rice price stabilization and agrarian reform program. Irrigation, in which close to 20 percent of total infrastructure budget was allocated from 1974 to 1984, dropped sharply from the mid-eighties into the nineties. Only about 30 to 40 percent of public expenditures have been allocated for productivity-enhancing measures. Agricultural research is severely underfunded, with expenditures representing only 0.3 percent of GVA compared to an average of 1 percent among developing countries. Moreover, public expenditures continue to be disproportionately in favor of the rice sector which accounts for less that 15 percent of the agricultural GVA. (David, 1996)

Public expenditure allocation have not sufficiently focused on long-term productivity enhancing investments in order to reverse the declining competitive advantage of the sector. Without the government amply investing in productivity enhancing measures, the shriveling of agricultural land utilized for cereal production could only translate to the increased role of cereal imports.

Therefore, even if it is argued that the GATT-UR does not substantially open the agricultural market, a tariff reform program that goes beyond the tariffs inscribed by the treaty and an agricultural modernization program that gives premium to cash crops and livestock production seem to augur for the increased role of food imports in the future.

Much of the debate around market-driven agricultural policy is couched in terms of arguing whether market forces are good or bad for the sector. But such a track often leads to casting often emotional diatribes about the sins and virtues of protectionism versus free market. Rather than falling into this ideological trap, this paper seeks to raise three major concerns that a developing country like the Philippines has to address in the face of agricultural trade liberalization.

*First*, what is the actual situation in actual markets, specifically in those that local production stand to compete against? This is to check for the possibility that free market tenets actually do not hold in specific global markets thus rationalizing the placement of national protective measures until international distortions are corrected.

For instance, while the Philippines rushes to open its agricultural markets sans the necessary investments in enhancing its competitiveness, the treaty affords developed countries to continue to bestow high agricultural subsidies to their farm sectors.

US controls over three-quarters of the world market for corn. It also produces over 80 percent of corn substitutes soya and sorghum exports. Around one third of US agricultural land is said to be used to produce for export markets. In an average year, exports account for 25 percent of corn production, 40 percent of wheat production and 30 percent of soya production. The European Union, on the other hand, is the second major player in the basic foodgrains trade. The US and the EU together account for almost 50 percent of world market shares for wheat.

*Table 8. US and EU subsidies to cereal producers* (in US$)*

| | 1986-1988 | | 1990-1992 | | 1994 | | 1995 | |
|---|---|---|---|---|---|---|---|---|
| | US | EU | US | EU | US | EU | US | EU |
| Wheat | 4,868 | 7,650 | 4,133 | 7,733 | 3,625 | 9,155 | 1,989 | 8,715 |
| Percentage PSE | 54 | 56 | 46 | 51 | 39 | 55 | 23 | 47 |
| Maize | 8,422 | 2,687 | 4,531 | 2,651 | 5,518 | 2,359 | 2,464 | 2,790 |
| Percentage PSE | 42 | 55 | 21 | 35 | 21 | 49 | 11 | 50 |
| All crops | 17,224 | 22,035 | 11,908 | 21,500 | 12,635 | 23,138 | 7,266 | 24,023 |
| Percentage PSE | 39 | 60 | 25 | 56 | 23 | 58 | 16 | 53 |

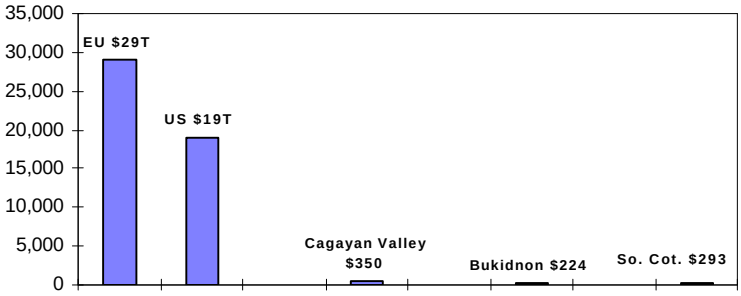
*Based on the OECD's Producer Subsidy Equivalent (PSE) measure which reflects five categories of policy measures, to wit: (1) market price support; (2) direct payments; (3) reduction of input costs; (4) general service which reduces production cost; and (5) subnational subsidies. The percentage PSE is expressed as the total value of transfers as a percentage of the total value of production

Source: OECD(1995) cited in Watkins (1996)

The livelihoods of the rice and corn producers in the rural villages of the Philippines are then inexorably affected by the farm policies pursued in the US and the EU in as much as world prices are bound to hover around the prices these countries set for their produce. In both countries, and in most of the developed world, the protection of their farm sectors continue to be pursued (ostensibly within the GATT-UR framework) what with their agricultural support systems characterized chiefly by direct subsidy transfers to farmers.

OECD estimates that each US farmer received an average transfer amounting to $29,000 in 1995. The total subsidy given to EU farmers, $97 bn, is equivalent to half the value of its production.(Table 8) The overall impact of subsidisation by the US and the EU is that commodities are exported at prices which bear no relation to the real costs of production.

*Figure 3. Total transfer per full time farmer in the US and EU (1995 projection) and per capita income in selected provinces (1994)*




These subsidies thus pose unfair competition and grossly distort the image of a level-playing field in the agricultural world market. A comparison of total transfer per full time farmer and per capital incomes in South Cotabato, Bukidnon and Cagayan Valley, major yellow corn-producing provinces in the Philippines, provides a stark reminder of this point. (Figure 3)

*Second,* what are the institutional roots of the Philippine agricultural sector=s ill performance? This is to emphasize that institutional arrangements may be as important, if not more, as free market forces in determining the ability of the sector to compete in the global arena. If non-market bottlenecks in the agricultural sector**C** like the agrarian reform problem and the inadequacy of investment into rural infrastructure such as farm to market roads and post-harvest facilities and into agricultural research and development that would increase rural productivity**C** are addressed properly, then the prospect of competing with food imports becomes less fearsome.

For instance, the cost of marketing yellow corn in the Philippines is a major source of the said sector=s cost-disadvantage. While the marketing to total cost ratio in Thailand stands at 27 to 32 percent, the same falls within the range of 33 to 37 percent in the Philippines. (Setboonsarng and Gonzalez, 1991) The sorry state of transportation infrastructure and storage facilities are the main culprits behind the high cost of marketing in the Philippines. The cost of bringing the produce from farm to user is a high US$ 60 per ton in the Philippines compared to only US $12 in Thailand. Given that the yellow corn market is geographically segmented, the high cost of distribution makes it cheaper for the country to import yellow corn from Argentina, Thailand and the US than procure it from the local production point.

*Third,* what safety nets are in place to alleviate and compensate the vulnerable sectors of food producers? This concern puts to the fore the idea that the distribution of benefits and losses is just as crucial as the projected efficiency gains from a policy of liberalization.

The Philippines= GATT-related adjustment measures are heavily criticized for lack of targetted safety nets. Half of the PhP 30 B went to the infrastructure projects of the Department of Public Works and Highways. The Department of Agriculture and its attached agencies received less than 27 percent of the total appropriation.

The more disturbing criticism is how some capital provisions of the GATT fund were appropriated for glaringly non-GATT adjustments related projects. This goes to show that the fund earmarked for safety nets was actually just a regular budget item in the General Appropriations Act with the budget title changed. No new appropriations were actually made expressly for adjustment measures. If the Aquestionable@ projects (i.e., those projects that government would have implemented sans the ratification of GATT) were stricken out, only PhP 3B or 10 percent of the figure alloted would be left for the fund (Montemayor, 1994)

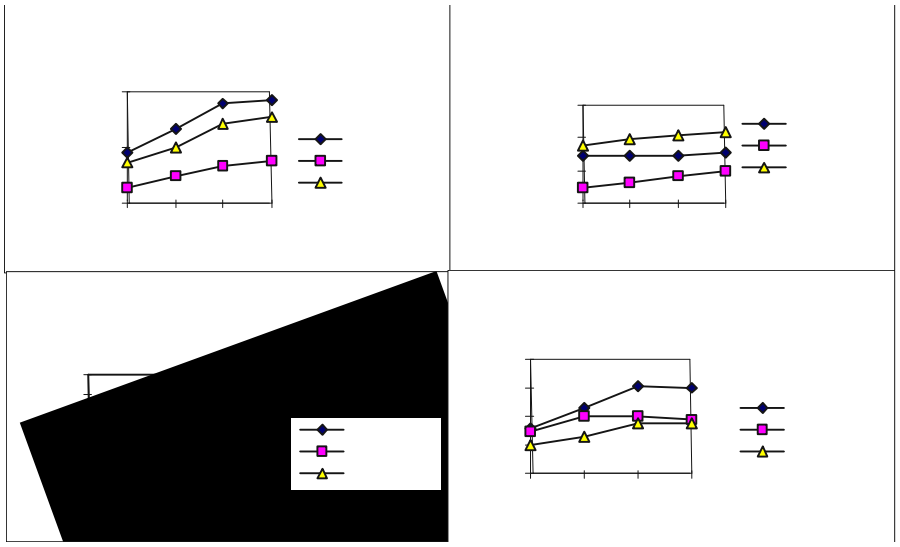
If productivity and hectarage of prime agricultural land continue to suffer, food imports appear to be an inevitable supply source in the future. The food sectors in developing countries like the Philippines need not succumb to this development by default. Addressing the above-mentioned concerns will ensure that food producers will enter the global arena equipped.

## Part 3. Domestic dimensions of food security- the socio-economic environment and farmers quest for sustainability

Nearly 60% of the world's population live in Asia. This huge mass of 3.1 billion people has to derive food from approximately 30% of the world's land area available for agricultural production. Asia's population is projected to reach 4.9 billion by the year 2025 (Bulatao, 1990). The arable land per capita of 0.137 ha in 1990 is expected to drop to 0.056 ha by 2030 (Ange, 1993). The one hectare that supported 7 persons in 1990 has to support 17 persons by 2030; that is, raising food production by two and one-half times that of 1990.

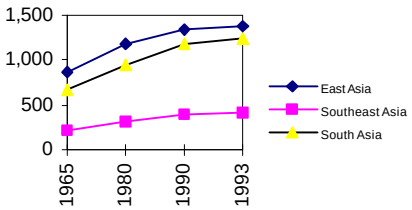
To attain the production target means technologically intensive farming systems on finite arable land. In the past the confluence of modern varieties and farming systems, institutional support, land area expansion, and domestic policy regimes produced agricultural growth that outpaced population growth. In the coming decades however population growth will rise more steeply, along with poverty and illiteracy, while area expansion becomes negligible and science is facing leveling off or declining crop yields. These issues and related constraints on food security and sustainability are addressed in the following sections. Emphasis is given to the lower income countries of Southeast, South and East Asia and focus on the Philippine scenario for specific cases.

*Figure 1. Trends in the agricultural sectors in selected Asian regions: 1963-1995*



Source: FAO (1994) cited in ?

**historical trajectory of agricultural growth in Asia**




The agricultural performance of Southeast, South and East Asia from 1965 to 1993 is quite impressive (Figure 1). The total crop production shown in Fig. 1 gave an increase of 126% while the magnitudes of population (Fig. 2) resulted in an average increase of 75% for the three regions. The trends naturally produced increase in agricultural production per capita (APC) which is highest (42%) for Southeast Asia; the least (16%) was observed in South Asia. Southeast Asia had the lowest magnitude of harvested area among the three

regions but it achieved an average expansion of 105%. The very small expansion (7.7%) that occurred in East Asia over the 28-year period indicates that remaining areas are largely not useful for agriculture yet current agricultural lands are being usurped by urban expansion.

Of the total cropland in 1993, one-half is devoted to food crops in Southeast Asia while the other two regions used three-fourths for food crops. Such trends reflect the priority of Southeast Asia to nonfood crops for export in opening new areas for agriculture. The limitation of area expansion in East Asia is compensated by high crop productivity that greatly surpassed those of South and Southeast Asia in the 1990s. East Asia has gone beyond doubling its productivity while Southeast Asia achieved only 44% increase. South Asia achieved 100% increase but over very low initial productivity.

Gross trends in agricultural growth are useful indices on the successor failure of policies and programs on an overall basis. Such gross trends do not reflect the impact of agricultural growth on food security and nutritional sufficiency of the populace. For instance, Insdia's self-sufficiency in food grain production was still accompanied by widespread malnutrition. Most severely affected are the landless farm workers, urban slum dwellers and remote tribal communities. Similarly, the impressive agricultural growth of the Philippies in the late 1960s to early 1980s did not have significant impact on rural poverty reduction. Inequality of income distribution persisted as a problem in rural economy.

**ecological constraints on food security**

Sound ecosystems allow sustainable food production when used properly within the bounds of their resilient nature. Natural disasters and human activities may strain the ecosystem beyond its resiliency. When this happens, mankind has to content with a debilitating life in an impaired ecosystem.

natural disasters

Natural disasters of periodic occurrences in Asia include hurricanes, typhoon, floods, and drought. Those of non-periodic occurrences are earthquakes, volcanic eruptions, tidal waves, and forest fires. There is no intention here to catalogue Asian disasters and aftermaths. Suffice it to say that the typical Asian grows up with the periodic natural disasters and recognizes that nature can damage and heal the ecosystems. It is the non-periodic disaster that beleaguers the Asian spirit when the ecosystem is badly damaged.

For instance, the devastating eruption of Mount Pinatubo in 1991 affected a whole transect of ecosystems on the landscape from the highlands (1000-2000 m elevation) down to the fishing grounds along coastlines. This violent eruption was soon followed by even more devastating and seasonal lahar. Of the total affected area that reached 1.8 million hectares in 1993, 53% consisted of once productive lowland ricefields and diverse upland farms. Behind these figures is the untold human misery of the dispossessed and dislocated.

man-induced disasters and environmental deterioration

Wide-ranging man-induced disasters include flash floods due to extensive deforestation, localized floods due to poorly built dikes, and forest fires due to human activities. Improper cultivation and management of land along slopes cause extensive soil erosion and loss of fertile topsoil. As much as 100-200 metric tons soil per hectare per year may be lost due to the erosive action of runoff on unprotected soil. Thus, it could take only 2 to 3 years to lose a sheet of one inch soil layer that took 300 to 1000 years to form. Definitely, this is man-induced disaster. It is working the soil beyond its renewable nature, a disastrous and unsustainable use of agricultural land.

Agroecosystems suffer from cumulative effects of farm chemicals that pollute the land, rivers, streams, and groundwater. Health deterioration and even death hover among millions of farm workers who manually handle pesticides without appropriate protection. Disappearance of protein foods (fishes, shrimps, clams, crabs, etc.) that used to abound in farms and streams, intensified malnutrition among the rural poor. Aside from toxicity effects, there is also accumulation of salts particularly on low-lying areas that cause widespread salinization and seasonal waterlogging. On the other extreme, lack of proper intervention on fragile lands under arid to semi-arid conditions accelerate desertification.

The industry sector is also a notorious polluter. Mine wastes and industrial effluents that carry toxic elements pollute the land and water systems with deadly consequences to all forms of life. Acid rain due to industrial gases may cause slow but extensive deterioration of land, water and plants; in some locations, the deterioration of resources is localized but more severe.

Disasters and environmental deterioration due to human activities can be controlled or minimized by proper usage and by legal means. However, there is an environmental stress due to a pervasive social phenomenon is Asia that governments find extreme difficulty to curb.

poverty and environmental stress

Poverty drove huge masses of migrants to subsist on resources in upland areas and forestlands where there is practically no access to basic services. A large portion of those migrants consists of the landless and near-landless (tillers of less than 0.5 ha). For prospective setting, two countries are taken as examples - Philippine and India.

*Philippines.* Landlessness, poverty, and rapid growth of labor force that lacks skills for nonfarm jobs constitute a complex mix of problems in rural

communities. Social vent came in the form of migration. One portion went to urban centers and further swelled the urban poor, a second portion went to sugar and coconut farms where wages are below subsistence, and a third portion went to the upland areas (greater than 18% slope).

The magnitude of upland migration is reflected from the hectarage of cropped upland. It increased more than sixfold from 0.58 million hectares in 1960 to 3.92 million hectares in 1987 (Cruz, 1992). As far back as 1985, upland population already reached 17.5 million (about one-third of total population). Persistent increase of upland population through the years is evident from the equally persistent concentration of land. In 1991 less than 3% of the total number of farm owners accounted for more than 30% of total farmland.

Indigenous peoples in upland and forested areas have their native way of ecologically working with nature, although at subsistent level. In contrast the migrants tilled the soil customarily like in the flatlands and caused extensive soil erosion. Meanwhile scarcity of fuelwood drives the farmer to cut down trees and shrubs within reach. Magnify the scenario a million times and visualize the extent of eroded lands, loss of biodiversity, and accelerated deforestation. The scarred land snuffs the hope of the millions of upland children for better life. The Department of Environment and Natural Resources have well-meaning programs on reforestation, rehabilitation of watersheds, and innovative management of protected areas. Some NGOs have productive work with the migrants but they are like few grains in a bucket of sand.

*India*. Landless farm workers make up 45% of the rural poor; likewise, migration to the forestlands became a natural vent of landlessness and poverty. About 300 million rural poor depended on forest resources for livelihood. Poffenberger (1990). Forest cover was estimated to be 63.9 million hectares (MEF, 1991). The unecological impact of converting forestland into farmlots by millions of inhabitants is aggravated by their huge daily requirement of fuelwood for cooking and fodder for livestock. About 100 million livestock grazed on forestland with carrying of 31 million (WCU, 1991).

Forestland degradation is indeed an immense problems but India has been quite successful in pursuing innovative approaches to forest management. Implementation of partnership between inhabitants and forestry departments facilitated by NGOs is a recognized feat that arose after many years of conflict.

**institutional constraints on food security**

The bulk of the world's population lives in Asia; the bulk of the world's poor (73%) is also in Asia. High population growth, poverty, and illiteracy characterize the social landscape of the lower income countries of Asia. Only a good reading of the complexity and enormity of the situation leads each government to policies and programs that ensure food security, development growth, and people's welfare.

poverty

Urban and rural poverty vary in extent and intensity. Rural poverty accounts for three-fourths of the total poverty and afflicts people at greater intensity. The rural poor has little or no access to basic services as the urban poor. Of the rural poor, majority depends on agriculture for employment and income; hence, the poorest of the poor are the landless farm workers. This sector constitutes 45% of the rural poor in India and 40% in Bangladesh. To describe the poor in terms of figures and survey data offers a detached and objective methodology often used by "povertycrats". But people who have experienced quagmire know too well that poverty debilitates people and robs them of human dignity. To the poor who refuse indignity, poverty leads them to insurgency.

illiteracy

Illiteracy is a huge social burden in South Asia. As late as 1990, illiteracy in the region still exceeded 50% with women bearing the brunt. More than 70% of women 25 years or older are illiterate (Bardman, 1996). This is also the region that has 40% of the world's poor and persistently high annual population growth (2 to 2.8%). A notable exception is Sri Lanka with population growth of 1.5% per year and illiteracy of only 12%. East Asia and Southeast Asia generally have better record of literacy but is it a comfortable basis of complacency?

Simple literacy test (read and write) has served well as a convention in the world's campaign to eradicate this social malignancy. With today's global concerns in economy and environment (Uruguay Round, WTO, earth summit, Agenda 21) simple literacy should be replaced by functional literacy (read, write, compute, and comprehend). Level of comprehension may not necessarily exceed the high school graduate. Functional literacy data are not readily available; hence, a focus on the Philippine scenario.

In 1994, the Philippines recorded a high simple literacy of 95% of the total population with ages 10 to 64 years. Behind this impressive record however, is the reality of a huge work force confined to jobs of low productivity because of functional illiteracy. Of the 1994 population of 48 million (10 to 64 years old), average functional literacy was 83.8%; average for women was 85.9% and the men, 81.7% (NSO, 1994). The more relevant information with respect to food security and sustainability is rural functional literacy (RFL) from which rural functional illiteracy (RFI) is calculated as % RFI = 100 - % RFL. On the average RFI yielded a distressing figure of 42%. Across 14 regions in the country, RFI gave a wide range of 31.8 to 62.3%. Thus, even the lower RFI means that one of every three persons in rural communities is functionally illiterate.

patterns of development strategies

A reading of history in the recent past showed that market intervention by government to help the poor has been generally counterproductive both in terms of efficiency and equity. This observation transcended wide differences of initial and prevailing conditions (economic resources, agrarian structure, physical infrastructure, human and social capital, cultural millieu, political institutions) among countries in Asia. Innovative approaches and policies were then pursued to achieve economic growth and reduce poverty. How did the lower income countries perform?

*Growth in agriculture and GDP*. The performance of ten countries for two periods (1965-80 and 1980-94) is depicted in Table 1. In the first 15 years Nepal and Bangladesh had the lowest annual growth but they performed well in the second period. In contrast the Philippines did impressively in the first period but slid down to the bottom in the second period. Such poor performance was attributed to a number of causes among which are: economic structure and policies, increase in interest payments, crippling power shortages, devastating floods, earthquake (1990), and Mount Pinatubo eruption (1991), and subsequent lahar devastation. Except for the poor performers, did high growth similarly cause high poverty reduction?

*Poverty alleviation*. Among nine countries in Table 2, Balisacan (1996) compiled data up to early 1990s from various sources and observed impressive annual rural poverty reduction or RPR (1.38 to 2.19%) for China, Indonesia, Malaysia, Thailand, Bangladesh and India. Only slight annual RPR (0.25 to 0.61) characterized Nepal, Pakistan and Philippines. Among countries in the first group, only China and Indonesia had annual RPR that slightly exceeded annual population growth (0.39 and 0.26%, respectively). All the rest gave negative values but the most negative were attributed to Nepal (-2.34%), Pakistan (2.19%) and Philippines (2.05%).

In great contrast to snail-posed RPR of above-mentioned countries, is the remarkable success of South Korea in handling its rural poverty problem. The government set policies and implemented action programs accompanied by strong motivation of the rural people to extricate themselves from poverty. If rooted in people's culture, a noble motivation brings out the best among the citizenry. Thus, South Korea has reduced rural poverty from 23.5% in 1970 to 6.5% in 1988 inspite of the fact that 62% of the farms are less than one hectare. Now, the Korean farmer is technically equipped to produce cash crops even in winter months when the land is supposed to be uncropped.

institutional and political deformity

Agriculture and food are vital concerns to every nation. A wide array of functions related to agriculture and food includes planning, agrarian structure, rural development, credit, trade, education, research and extension. The institutions have long standing bureaucracies for designated functions but development priorities are often set by incumbent officials of the government. Beyond political dependence however the institution has, through time, fortified its framework primarily geared to the preservation of its functioning (existence) rather than its functional objectives. Adjunct to its preservation, the institution does not formulate and pursue policies not in consonance to the interest of ruling political and business elite.

Some institutions may have undergone re-orientation in some functions or even change in name, but still preservation of its existence is paramount. The newfound objectives are often used to endear the institution to the people instead of striving hard for people to benefit from the institution. The litany could go on and on even in monotonous fashion.

Economic prosperity and quality of life of societies in rich countries have long been the aspirations of poor nations. For the past many decades, however, the aspiring nations have not recognized the path-dependence nature of development and the culture-dependence of this path. An outstanding example is education and research. Inspite of burgeoning poverty and illiteracy among their people, governments of poor nations relentlessly invested huge resources to higher education up to post graduate degrees following the narrowly specialized fields of the agricultural sciences. Meanwhile, the huge masses of poor and functionally illiterate farmers were merely treated as passive recipients of technology. Contrary to this, NGOs have shown that there are alternative and innovative ways and means of harnessing the rural poor as active partners in development.

The experience of South Korea again becomes relevant. Agricultural education and academic research followed the conventional paradigm of discipline-based specialization but the Koreans evolved their own model of community development called "Saemul Undong" (New Village Movement). The seed of the movement originated from simple self-help and cooperative projects of rural villagers. It blossomed into a spiritual movement of hardworking and cooperative farmers who seek knowledge and skills, put them into practice, and achieve continual progress. The living spirit of Saemul Undong contributed to what South Korea is today.

**biophysical constraints**

Physical resources in nature and conditions that affect the life of plants and animals constitute the biophysical aspect of agriculture. Biophysical constraints refer to the limiting effects of soil and water resources and agroclimatic conditions. Assessment and mapping of these constraints over agricultural lands in a geographic unit serve as practical basis of policies, guidelines and programs for integrated management that may overturn constraints into production assets.

On a large scale, biophysical constraints are addressed by government and corrective measures are implemented otherwise food security is compromised. Typical examples of such programs are infrastructure projects (big and small) to provide irrigation water to croplands in some locations and in

waterlogged locations, to drain the excess water. Progressing desertification is one of the toughest problems that confront government and public sectors in arid regions. It cannot be corrected by infrastructure investment but by painstaking and slow process of establishing tree lines.

In contrast to those biophysical constraints that are mitigated by government action, the soil constraints prevailing on farm lands are dealt with by farmers. Resource-rich farmers are capable of overcoming constraints but poor farmers usually opt for subsistence farming by ignoring the situation. The latter option is a disastrous one on fragile lands.

For a cursory look at the extent of soil constraints and soil-related constraints in Southeast Asia (Indonesia, Cambodia, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam), the summary in Table 2 would be useful. In over 380 million hectares, only 14% of the land area has no serious limitations. These are the prime agricultural lands. Serious limitations due to excess water (swamps, marshes, peats, etc.), shallow depth (then soil layers over bedrocks usually on steep slopes), and drought (sandy areas under arid climate) are uneconomical to reclaim with current technologies.

The largest group of limitations (59%) consists of various forms of mineral stress on plants primarily due to soil of nutrient deficiencies, nutrient imbalance, and toxicities of elements and substances. Some these problems may be too severe to warrant reclamation but other problems can be corrected by most technologies that have long been developed by agricultural researchers. A similar conclusion is drawn from the data in Table 3. The largest grouping of soils classified as Acrisols (or Utisols) are the intensely weathered acid soils which have been depleted (moderate to severe) of plant nutrients and dominated by high concentrations of iron and aluminum that could be harmful to plants.

For most of these problems, technologies are available. The bottleneck is in their adoption and proper use by farmers. Again, poverty and functional illiteracy come to focus. They are the bottleneck that can only be relieved substantially by an institutional framework designed to address social, economic and technical needs/problems in their holistic occurrence and natural setting.

technical and political barriers

There is now wide recognition that yields of modern varieties of cereals have reached their ceilings under conventional state of soil, water and fertilizer management even in on prime lands. Rich countries with strong research institutions also face the problem. Researchers at the International Rice Research Institute have been working on the causes of declining rice yields for several years.

The NGOs from lower income countries have expressed great concern about biotechnology research institutions growing fast in the corporate world of profit seekers. This trend further magnify the gap between the poor and nonpoor in their access of benefits from science and technology.

Current state of affairs clearly demonstrate that the poor still have to benefit from the fruits of agricultural science in the last four decades. Investment in education and technical training of the rural poor is the heart of social sustainability. The extent by which resources and food production system can be made sustainable depends on knowledge and skills of the food producers.

## Part 4. Coping with Food Insecurity

**strategies for sustainability**

Strategies for sustainability are based on a triad framework that supports agriculture and food security (see Fig. 1). The framework has three interrelated aspects: economic, social and environmental sustainability. Their interrelations are initially clear from the concept of economic sustainability as maintenance and/or build-up of capital (human-made, natural, social and human). Natural capital is the natural environment or the stock of naturally provided assets (soil, water, atmosphere, forests, marshes, etc.). Economists should not only consider values in money terms but also intangible and intergeneration values and environmental costs. Human capital refers to investment in education, health and nutrition of individuals and in science and technology. Social capital broadly covers social values, norms, organizations, institutions, culture, etc. that altogether contribute to socially vibrant and peaceful communities.

Social sustainability arises from strong and systematic community participation or civil society and firm adherence to values that sustain peace and preserve culture. Environmental sustainability arises from the protection of the biophysical (soil, water, land, air) and biological (plants, animals, forests, microorganisms) resources against degradation and loss. Sound environment is vital to human life and welfare. Use of natural resources should not cause degradation of the environment. Humanity has to live within the limits of the physical environment as provider of inputs for human needs and as sink for human-generated wastes (industrial, agricultural, residential, commercial, etc.).

The triad framework in Figure 1 is supported by policy regimes that provide guidelines for action programs to achieve food security following the basic principles of sustainability in each of the interrelated aspects. Policies and sustainability efforts are subject to market forces and trade regimes at national and international levels; they are also subject to political influences.

The multiple facets of food security (resources, processes, market, trade policies) indicate interrelated complexities that should be considered in formulating strategies for sustainability. Instead of featuring complexities however, strategies identified below are those needed to remedy the most glaring deficiencies, shortcomings, or defects that constrain the triad model from achieving its target of sustainability and food security.

human development

The twin problems of poverty and illiteracy need a diverse mix of solutions but at the core is education and skills training for the farmers and farm workers and their children such as:

innovative education and skills training for the functionally literate regarding sustainable/diversified farming, farm entrepreneurship, and non-farm job/entrepreneurship; trainer's training skills to enable them to teach the functionally illiterate.

alternative ways of education/training for functional literacy through training modules on sustainable farming systems or non-farm jobs.

free vocational high school education for the farmer's children.

simple literacy test shall be replaced by functional literacy test.

access to resources, facilities and services

A trained individual needs access to land (agrarian reform), facilities (irrigation, roads, transportation, postharvest equipment, storage, etc.), credit and technical services.

partnership between government agencies or ngo-s with upland migrants

The sheer magnitude of migrants in upland areas, hillylands and forestlands need immediate attention by the state. Because the need is inherent to any human being, aversion to hunger and hard life in hinterlands is also natural. This means that the migrants have no better choice. A partnership between government agencies or NGOs shall seek ways and means of providing some forms of basic services to the migrants. It shall control soil erosion and promote ecological and diversified farming systems that enhance social quality and agricultural productivity.

public investments for education, research and training

The strategy is to deviate from merely copying the science and education paradigm of high income countries. Discipline-based basic research that lead to new discovery of materials and processes shall be pursued by students and scientists with the highest capability and inclination for basic science. Outside basic research are problem-oriented research to serve urban and rural populace.

Urban centers shall devote to science and education that address basic needs of society (health care, pharmaceuticals, nutrition, etc.), goods and services for industry and manufacturing, goods and services for business, trade and management. Rural communities shall devote to science and education of the production and processing of agricultural products, entrepreneurship, agricultural business, skills training, etc. Problem-oriented research follows two tracks: **consultative research** (consultation with farmers for problem identification and technical research) and **participatory research** (problem identification with farmers, skills training for functionally literate farmers, and action research on identified problems). Research shall respond to requirements for sustainability of high crops and livestock productivity, ecosystem-based farming systems, holistic approach tofarm systems (social, economic, technical) and processing of farm produce. Alongside are socioeconomic, market and policy research; methodology research on education to accelerate literacy; communication and information base build-up for rural communities.

Alternative approaches to research can also cut down much of the time conventionally required from technology generation to actual adoption by farmers. This is a research domain that NGOs have dominated for several decades. For instance, a Philippine NGO (Farmer-Scientist Partnership for Development, Inc.) that was established in 1986 to respond to farmers' need of new rice cultivars, came out with a research-cum-training project where farmers developed more than 50 new rice cultivars (Briones, et al., 1996). Aside from saving on time, money and resources, the farmers obtained unique knowledge and skill (rice breeding) and training on varied aspects of sustainable and diversified farm systems. The unused brains of millions of farmers, due to deprivation of education, can be tapped for highly productive activities.

Science and education (formal and nonformal) should be geared towards sustainability and food security. Colonial mentality of aping the rich countries has already done much harm to society. Young people have to face realities in their sociocultural millieu.

policies

Policies should support and promote the abovementioned strategies. In addition, policies that created bias against the agricultural sector should be corrected. There shall be strong institutional re-orientation for current objectives of sustainability and food security. Existing institutions of state colleges of agricultural (SCA) are often weak in both curricular and research programs and underfunded but they have the strategic advantage of being dispersed in the countryside. As state colleges, they are guided by government policies and response is generally fast. This is to be expected from large agricultural universities of long history as academically independent institutions of learning.

new partnership for sustainability

To expand the reach of NGOs with track record in grassroots education, research and development, a new partnership may be established with responsive members of the faculty of SCAs for the development of innovative programs covering farming and farm systems, processing, market studies, and entrepreneurship. All programs are geared towards sustainability and food security.

Democratization of decision and policy-making

At all levels, there shall be people's participation and support to civil society actors in the enabling-and- empowering process. The process shall prioritize the landless and the small food producers who are the most disadvantaged sector in the food security continuum.

**rethinking food Security and search for viable options**

Focusing on the lower income countries of Asia, the paper clearly identified the poverty-illiteracy twin (with attendant problems of unemployment, underemployment, low productivity, high population growth) as primary problem in the issue of sustainability and food security. Poverty is a birthmark of the landless, near landless, unschooled, unskilled, uninformed, and increasingly, the rural migrant to the upland and forestland. The latter till the land for subsistence living and cause widescale soil erosion and genetic erosion.

Gains from agricultural growth do not cause significant reduction in rural poverty if rapid growth of rural unemployment remains unchecked and rural infrastructure, neglected. In other words, gains from agricultural growth are not substantially plowed back to spur rural economy.

Market forces are traditionally dominated by middlemen who profit much more than those who toiled hard and long. This is a monotonous note about the rice industry in lower income countries of Asia. To many Asians, food security is rice security but the rice producer is also a net rice buyer due to low output-input price ratio. The prevailing market system does not favor plow-back of net gains for rural capital build-up.

International trade offers a global playing field where competitiveness is the rule of the game. Countries around the world signed up for the game but the world will not see much spectacle of "David-Goliath games". Most of the low income countries bear the heavy burden of external debt and poverty.

Numerous conferences on sustainability and food security have put forward ecological issues on account of pervasive degradation of the natural resource base of agriculture and food.

This paper recognizes the issue of environment as one of a triad partnership (economic, social and environmental sustainability) for sustained food security, along with attendant policies, market forces, and international agreements. However, it zeroes in on dire need of policies that invigorate rural economy and extricate food producers from an unjust chain of malnutrition.

Formulation of such noble policies, under favorable political climate, can be done in no time but the speed of achieving the goal is dependent on the capability of the rural populace to realize and non-farm income. People should be equipped with knowledge and skills and given access to resources and opportunities. Policy makers have to face the ugly face of illiteracy. By all humanly conceivable means, enable the intellectually-deprived people to take on their positions in the scafolding of a vigorous rural economy.

Diverse proposals (big and small; simple and complex) can be generated in the field of rural economy. This paper focuses on a proposal for a new GO-NGO partnership to work on the enabling-empowering process for the rural populace. Development NGOs have a wealth of experience in this aspect but their reach is fragmented and small scale. On the other hand, the state has state colleges of agriculture nationwide which are usually underfunded and traditionally carrying on the formal system of education. The two organizations can work in partnership with the village people and create centers of consultation, dialogue, planning, alternative education, skills training, cooperation, market development, and informations base. Using varied and dynamic methodologies, the partnership shall arrest the malignancy of illiteracy and accelerate poverty reduction at substantially faster rate than population growth. The partnership shall address environmental sustainability by educational campaigns and action projects with rural inhabitants across ecosytems. The partnership shall pursue policy advocacy and institutional build-up for the integration of project achievements to boost rural economy and raise peoples quality of life.