Food Security in South and South East Asian Countries

By

G.S. Bhalla
Jawaharlal Nehru University

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Institute for Studies in Industrial Development
Narendra Niketan, I.P. Estate, New Delhi - 110 002.

Part I - Introduction

Most of the populous countries of Asia which faced a serious food crisis during the early 'sixties and the early 'seventies were able to achieve significantly higher growth in domestic food production after the mid-'seventies. This enabled many of these countries to considerably improve their performance in the matter of providing food to their people. This notwithstanding, with a few exceptions in most of the countries of Asia, per capita availability of food and nutrition continues to remain far short of the required levels. The rapidly rising demand for food by the highly populated countries of Asia on the one hand, and the persistence of chronic food shortages and near famine conditions in some African countries on the other, has once again highlighted the need for providing food security to teeming poor of the developing world. Whereas it is true that during the 20th century the world food production exceeded that of population by a comfortable margin, this has failed to solve the problem of shortages and famines in some parts of the world due to highly skewed regional pattern of agricultural production. While all surpluses have emerged in the first world, it is the third world which has faced food shortages and where the levels of calorie intake have remained inadequate. The problem has been further excerbated because of lack of foreign exchange resources with the governments and lack of purchasing power in the hands of a large number of poor people living in the third world.

The purpose of this paper is to examine the current state of food security and its future in the South and South East Asian countries of Bangladesh, India, China, Pakistan, Nepal, Sri Lanka, Burma, Thailand, Malaysia, Philippines and Indonesia. The problem would be studied in the light of broad concept of food security which emphasises that the ultimate objective of food security ought to be not only to make provision for the physical availability of adequate amount of foodgrains for the entire population on a stable basis throughout the year, but also to assure that all population including the poor and vulnerable sections have economic access to foodgrains.[1]

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1. Food and Agriculture Organisation of the United Nations (FAO), Conference, Twenty-fourth Session, (1987) "Evaluation of the Food Security Assistance Scheme", Rome. C87/8-Sup.3.

> Another World Food Council document has further elaborated the concept as follows: "The ultimate objective of food security is to assure an adequate and stable supply of food to the entire population throughout the year. Satisfactory production levels and stability of supply must be matched by a reduction in poverty and an increase in effective demand in order to ensure economic and physical access to available food on the part of those who are poor or otherwise unable to procure sufficient food in exchange for their services. A long term answer to this problem lies in a balanced and equitable national economic development strategy which would include, in addition to increasing food production, growth in employment, income, and community services generally. In the short term, however, increasing the income of poor households through market intervention or targeted distribution programmes can improve their access to food." FAO. World Food Council (1988): Measures To Improve Access To Food By The Poor. Rome. CFS 88/4, Page 15,

The eleven South and South Asian countries proposed to be studied in this paper have several common features. They share a colonial past and are currently low or middle income level countries at different stages of economic development. In 1988, as many as 2.5 billion people were inhabiting these eleven Asian countries and their combined population accounted for nearly 53 per cent of total world population. Further, nearly 70 per cent of the world's total poor were living in the South and South Asian countries.[2] In all the countries population grew rapidly during the second half of the century, although there was some deceleration in population growth during the recent decades. The Asian countries faced acute shortages of food during the early 'sixties and early `seventies and were the focus of world attention due to frequent occurrence of food shortages. These shortages were met by the large food imports through food aid or otherwise. Several pessimistic predictions were made about the future of food security in Asia on the basis of the severity of these food shortages. For example the Asian Development Bank in its survey for 1977 predicted mounting foodgrains deficits unless remedial measures were undertaken in most Asia.[3] Paddock & Paddock by late `sixties had categorised India as a lost case, since there was no hope for it to increase its food supplies.[4] Most Asian countries were successful in belying these pessimistic predictions. With only a few exceptions by the mid `eighties most of these countries succeeded in recording significant increases in their food production trough the widespread adoption of new seed-fertilizer technology and none of these faced serious food shortages by the type experienced by them during the earlier period. Despite these successes, these countries face some formidable problems in the matter of providing adequate and stable food security to their people. First, these countries have succeeded in achieving only marginal self-sufficiency in food and some of them depend on fairly large imports. Second, in most of these countries, the present level of per capita availability of foodgrains is quite low. For most of the populous Asian countries, the most economic method of increasing per capita food availability is through significant increases in domestic food production. The Third problem faced by these countries is that of wide year to year fluctuations in their agricultural and foodgrains production. Consequently, stability in providing food to their population still remains a formidable challenge. Finally, the countries of South and South East Asia have large proportion of their populations dependent on agriculture. Productivity of agricultural workers is generally low. As a result, the income levels of agricultural workers in general and those of small and marginal farmers, landless labour and rural artisans, in particular, are abysmally low. Most of these countries have a fairly high incidence of rural and urban poverty. Therefore, in addition to increasing supply of foodgrains, these countries face the

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Para 48.

2. World Bank (1990): The World Development Report 1990. Oxford University Press (OUP) N. York. Table 2.1.

3. Asian Development Bank (1977), Rural Asia: Challenge and Opportunity, Report on the second Asian Agricultural Survey. New York; Praeger, 1977.

4. Paddock, W. and Paddock, P. (1968) Famine, 1975, London, Weidenfield.

formidable task of providing economic access of foodgrains to those who are poor. In this paper an attempt is made to briefly discuss all these aspects of food policy and food security in the South and South East Asian countries.

The paper is divided into four parts. After the introduction in the first part, the second part is devoted to a discussion of the crucial issue about the emerging scenario of rapidly rising food demand in these countries because of their increasing population and rising per capita incomes. This is followed in the third part by a discussion of the likely potential of these countries to increase their domestic food supply in response to increasing demand on a secular basis, and their self-sufficiency ratios. The fourth part briefly reviews the question of instability in food production and various national and international measures for imparting stability to the provision of food to the entire population throughout the year. The fifth part is devoted to a discussion of the issues involved in making food available to a large number of poorer sections of society who do not possess adequate purchasing power. A reference is also made to the food security of those sections who may be adversely affected because of rapid modernisation and the process of structural readjustment currently undergoing in many of these countries. Finally, the sixth part gives brief conclusions and makes some policy recomendations for the improving food security in these countries.

Part - II Demand of Foodgrains

The relationship between population and food is fairly complex and is supposed to proceed through various channels on either side. Given elasticity of per capita demand for food less than unity, an increase in the rate of growth in population will lead to an increase in the growth rate of total demand for food. Further, because of differences in demand elasticities across socio-economic groups, changes in income distribution will have an impact on food demand even if aggregate income growth is kept constant and the process of population growth itself could alter income distribution. Finally, there are several ways through which population growth could affect food supplies. Among these are: changes in per worker availability of inputs, changes in the size distribution of land, changes in land-man ratio and changes in technology of production. In the opposite side, food availability could also influence population growth (through Malthusian relationship) by affecting fertility and mortality. "To the extent that the process of growth of agricultural output affects land tenure, farm-size distribution and income earning opportunities, fertility rates and population growth rates may be affected as well".[5] In brief, on the demand side it can be argued that it is the twin forces of growth of popoulation and rise in per capita income that remain the main determinants of demand for foodgrains. According to some scholars,

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5. Srinivasan, T.N. (1987) "Population and Food" in Gale Johnson, D. and Lee, R.D. (Eds): Population and Economic Development - Issues and Evidence. The University of Wisconson Press, Wisconson. And also see Boserup, E. (1965): The Conditions of Agricultural Progress, Winchester, Mass. Allen & Unwin Press.

there are distinct phases in the development process that have a bearing on food demand. In the early stage of economic growth, the demand for food is high, people are poor and mortality rates are high leading to moderate growth in population and slow growth in per capita income. Effective demand for food only grows by 3 per cent or less keeping pace with population growth. Population growth increases with development taking place. As per capita income rises, both population growth and income growth lead to much higher demand for foodgrains. Even when population growth starts decelerating, the derived demand for cereals keeps on increasing because of high income elasticity of demand for livestock products since the demand for cereals for animal feed is quite high. In this phase food supply has to take a qualitative jump. This is only possible where new technology can be applied extensively. In general in this phase more reliance has to be on food imports inspite of the existence of dynamic agriculture as the total (direct and derived) demand is likely to outstrip supply. Finally, it is only at a later stage of development when population growth rates decline and growth in income begins to have little effect on demand for food, that meeting food demand can became manageable and even surpluses can emerge. Thus according to Mellor "it is increasing per capita income that is the dynamic factor underlying the growth in food demand in the Third World".[6]

Currently most of the countries in South and South East Asia are in the early or middle stage described above and are characterised by rapid growth of population alongwith medium to high growth in their per capita income. Further, most of them are at low or medium per capita income levels. At the present levels of their per capita income, rapid growth in population results in a rapid growth in the demand for foodgrains. The other influence on demand for food is exercised through growth of per capita income. The impact of income growth on food demand depends not only on its level, but also on its distribution among the population. Some scholars have developed econometric models that have endogenised the impact of changes in per capita income/expenditures of various expenditure groups by assuming some function (like linear expenditure system) for each group.[7]

In this paper, the estimates of growth rate in food demand because of rise in per capita increase have been derived by applying a simple rule of thumb on two alternative assumptions about income elasticity of demand of 0.4 and 0.6 respectively. These growth rates have been added to the estimates of population growth rates for each country given by the A.D.B. and the World Development Reports. Coming first to population, during

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6. Mellor, John, W. (1983) Food Prospects for the Developing Countries. IFPRI. Reprinted from the American Economic Review. Vol. 73, No. 2, May 1983. P 241.

7. Several models have been used to quantitatively estimates food population nexus. The four important food models that have received a great deal of attention are: Population Carrying Capacity and projections of Population size Models; The FAO model used in their Agriculture Towards 2000; The global 2000 Report; and the system Models of the IIASA. All these models treat population as exogenous and all but one (the IIASA model) treat per capita income also exogenously. For a critical review of these models see Srinivasan, T.N. op.cit. pp. 3-26.

1960 to 1970 population growth rate ranged between 1.8 per cent per annum for Nepal to 3.0 per cent for Philippines. The high growth rates in population continued during 1970-80 also in most countries except Sri Lanka and China. There was a visible decline in population growth rates in China from 1.9 per cent per annum during 1960-70 to 1.3 per cent during 1980-88 and in Thailand from 3.0 per cent to 1.9 per cent during the same period. For other countries, there was no significant deceleration. It is only during 1988-2000 that most of these countries except Pakistan, Nepal and Burma are expected to record a significant decline in their population growth rates.

There were wide variations in both the levels and growth of per capita incomes in these countries. In 1988, whereas Bangladesh, the poorest country of the region had a per capita GNP of 170 U.S. dollars, Malaysia had a per capita income of 1940 dollars. Among the low income countries were Nepal, China, India, Pakistan, Sri Lanka and Indonesia. Only Philippines, Thailand and Malysia belonged to middle income economics (lower middle income). Per Capita Income (GDP) recorded growth rates ranging between 0.4 per cent in Burma to 5.4 per cent in Thailand during 1960-70. Among other major countries, per capita income rose at a rate of 3.9 per cent per annum in Pakistan, 3.7 per cent in Malaysia, 3.3 per cent in China and 1.3 per cent in India during the same period. During 1970-80, there was some acceleration in per capita growth rates in some East Asian countries. Thus, per capita GDP grew at an annual rate of 5.4 per cent in Indonesia, 4.7 per cent in Thailand and 4 per cent in China. During 1980-88, there was a significant rise in the growth rates of per capita incomes in most Asian Countries except for Indonesia and Philippines (and Burma for which data are not very reliable). Most significant increase took place in China where per capita income rose at an annual rate of 9.0 per cent during this period -- a growth rate that was more than double that recorded during 1960-1980. Again per capita income increased at a rate of 3.0 per cent in India and 3.3 per cent in Pakistan during 1980-88. Per Capita GDP recorded a negative growth rate of 2.4 per cent in Philippines during this period. The details for other countries can be seen from Table 1.

Table 1

Annual Compound Growth Rates of Population, Per Capita Income and Food Demand

	Growth Rate of Population				Growth Rate of per Capita GDP			Growth Rate of Food Demand					
								A			B		
	1960-70	70-80	80-88	1988-2000	1960-70	70-80	80-88	1960-70	70-88	80-88	1960-70	70-80	80-88
Bangladesh	2.4	2.6	2.8	2.4	1.3	1.3	0.9	2.9	3.1	3.2	3.2	3.4	3.3
Burma	2.3	2.4	2.1	2.0	0.4	2.2	2.9	2.5	3.3	3.3	2.5	3.7	3.8
China	1.9	1.8	1.3	1.3	3.3	4.0	9.0	3.2	3.4	4.9	3.9	4.2	6.7
Nepal	1.8	2.5	2.6	2.5	0.7	0.0	2.1	2.1	2.5	3.4	2.2	2.5	3.9
India	2.3	2.1	2.2	1.8	1.3	1.5	3.0	2.8	2.7	3.4	3.1	3.0	3.8
Sri Lanka	2.4	1.6	1.5	1.1	2.2	2.5	2.8	3.3	2.6	2.6	3.7	3.1	3.2
Pakistan	2.8	3.1	3.2	3.1	3.9	1.6	3.3	4.4	3.7	4.5	5.1	4.1	5.2
Indonesia	2.0	2.3	2.1	1.7	1.9	5.3	3.0	2.8	4.4	3.3	3.1	3.5	3.9
Thailand	3.0	2.5	1.9	1.3	5.4	4.7	4.1	5.2	4.4	3.5	6.2	5.3	4.4
Philippines	3.0	2.5	2.5	1.9	2.1	3.8	-2.4	3.8	4.0	1.5	4.3	4.8	1.1
Malaysia	2.8	2.4	2.6	2.2	3.7	5.4	2.0	4.3	4.6	3.4	5.0	5.6	3.4

Source: World Bank: World Development Report: Various Issues, Washington D.C.

A Calculated on the assumption of income elasticity of demand for food equal to 0.4 in addition to growth of population.

B Calculated on the assumption of income elasticity of demand for food equal to 0.6 in addition to growth of population.

The estimate of the growth rates of normative demand for food in the various countries under study on account of increase in population and per capita incomes on the two alternatives assumptions about food elasticity with respect to income of 0.4 and 0.6 respectively are also given in Table 1. Taking income elasticity of demand at 0.4, it is noticed that in a few Asian countries like Indonesia, Malaysia, Thailand which experienced a rapid growth in per capita income (exceeding 4 per cent) along with fairly high population growth during 1960 to 1980, the growth in demand for foodgrains was well above 4 per cent per annum when account is taken of both population growth and increase in per capita incomes. As will be discussed in detail later on, food production figures by the FAO indicate that most of the rapidly growing South and South East Asian countries were unable to meet the normative demand for food and cereals through indigeneous production throughout the period even when a low income elasticity of 0.4 were assumed. The position became worse if one were to assume an income elasticity of demand for foodgrains of 0.6. An alternative estimate of growth of food demand during 1970-80 prepared by Tyagi by using the FAO data is given in Table 2 for comparison.[8] It will be noticed that his estimates of growth of food demand during 1970-80 are more or less similar to those derived in the above table.

Table 2

Per cent Annual Growth in Food and Cereals Production and Domestic Demand

Country	Percentage Annual Growth in Domestic Demand 1970-80 Food	1970-80 Cereals	Population Growth 1979-80	Percentage Annual Production Growth Rate Food	Cereals
South Asia					
Bangladesh	-	-	2.84	2.18	3.06
Burma	3.3	2.5	2.21	2.53	4.72
China	2.2	2.0	1.83	3.46	3.68
Nepal	2.1	1.9	2.48	1.06	0.29
India	3.0	2.6	2.19	2.54	2.59
Sri Lanka	3.1	3.1	1.67	5.71	3.69
Pakistan	4.2	3.5	2.75	3.15	4.07
Southeast Asia					
Indonesia	2.6	2.6	2.32	3.62	3.95
Thailand	4.6	3.7	2.49	4.52	2.72
Philippines	4.2	3.5	2.56	5.53	5.27
Malaysia	4.3	3.5	2.39	5.06	0.13

Source: FAO, Population, Food Supply and Agricultural Development, Rome, 1975, pp. 49-50.

8. Tyagi, D.S. "Introduction" in Tyagi, D.S. and Vyas, V.S. (Eds), (1990): "Increasing Acces to Food - The Asian Experience". Sage. N.Delhi, pp 35-36 and Table 1.9. The introduction contains valuable discussion about various aspects of food policy in the Asian countries.

A rise in per capita income results not only in direct increase in demand for cereals, but more important, it leads to much larger increase in derived demand for cereals. It has been fairly well documented that with a rapid rise in per capita income, there is a shift of expenditure from cereals to superior foods like meat, milk, fish and other animal husbandry products. The indirect requirement for cereals for animal feed is quite high. With some of these countries graduating from low level to middle level income countries, their demand for superior foods is likely to accelerate the derived demand for cereals. Mellor has estimated that for some rapidly growing middle income countries in the Pacific zone, cereal demand ranges between 6-8 per cent per annum. Hence inspite of the existence of dynamic agriculture, some of the comparatively richer countries among this group may have to depend on cereal imports from other countries.[9] An important implication for these countries is the need to augment growth of coarse cereals like corn, barley, sorghum and millets etc. primarily used for animal feed. This will need a diversification of research efforts which have so far been concentrated on wheat and rice only. In any case, the need for rapid growth in agriculture hardly needs more emphasis.

Part III: **Supply of Foodgrains in the South and South Asian Countries and Self-sufficiency Ratios**

Domestic Food Supply - The Changing Scenario

The crux of the problem of food security in highly populated developing countries in Asia lies in building adequate production potential in agriculture to meet the rising demand for food in these countries. While international trade can surely play an important role in meeting marginal shortages, these countries have to primarily depend on domestic production for meeting their demand on a secular basis. This is because these countries are highly populated, and a large proportion of their population is engaged in agricultural production. The production process in agriculture not only produces food for the population, but also generates incomes for the agricultural workers. It is important to fully exploit the domestic production possibilities in agriculture in order to provide productive employment to agricultural workforce. These countries can think of diversification within agriculture and a shift from agricultural to non-agricultural sector only after becoming reasonably self-sufficient in agriculture. Any diversification based on food imports is most likely to prove sub-optimal.[10] Further, in all large countries agricultural growth constitutes the base for overall development of the economy through the generation of powerful forward, backward and demand linkages. A dynamic agriculture can also lead to rapid accumulation in the non-agricultural sectors by ensuring cheap food - the main wage good in the economy. Hence the need is to build domestic supply potential in agriculture through policy measures including development of rural infrastructure and carefully designed price policy.

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9. Mellor, J.W., op. cit.

10. Vyas, V.S. "Food Policies and Food Security in Asia with particular reference to South Asia in Tyagi, D.S. and Vyas, V.S. (1990). op.cit. pp 442.

In the case of large countries in particular, self-sufficiency in foodgrains is an essential condition for food security from a practical point of view also. This is because the amount of foodgrains traded internationally constitutes a small part of their total domestic demand. For example, the total world trade in rice is only 10 to 15 mm tonnes per annum, while India alone consumes about 65 mn tonnes in a year so that a mere 10 per cent shortage amounts to nearly three-fifths of the total world trade. Even a signal for imports by these big countries is bound to send world prices sky rocketing. In view of the above, numerous scholars supported the desirability of self-sufficiency in food by large countries on both economic and non-economic reasons.[11]

The South and East Asian countries which have made a creditable progress on the food front during the recent decades started with considerable handicaps after the Second World war. Most of the countries in the region (except Thailand and Nepal) were under colonial rule for a considerable period of time. On the eve of independence, all of them were underdeveloped economies with very heavy dependence on agriculture. The agricultural sector was beset with many problems in all the South and South Asian countries. Almost all of them had inherited an archaic institutional structure and outmoded land relations, which posed a major constraint to growth of agriculture. Further, in almost every country rural infrastructure was almost completely neglected and very little investment had been undertaken in irrigation, power, roads and communications and scientific agricultural research and extension. Not only was agricultural sector deprieved of public investment, it was intensively exploited through excessive extraction of surplus by both the landlords and the colonial rulers. Consequently, the agricultural sector lacked any growth impulse and continued with traditional production technology.

The cropping pattern was dominated by food crops, mainly rice followed by wheat and coarse cereals and pulses. The yield levels were low as yield increasing technologies were few and far between and whatever progress took place as a result of irrigation and scientific inputs were confined to commercial crops only.[12] Another important

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11. Thus according to Alexandratos of the FAO, "A high level of self sufficiency is a widely held objective sometimes transcending purely economic considerations and many countries would like to pursue it even if it would be more economic (at the prevailing nominal rate of exchange and structure of production) to resort to food imports." He further adds, "There is an overwhelming economic reason why pursuit of domestic production even at nominal costs which, at the prevailing rate of exchange and structure of production are above those of world prices, may be a sensible course of action. This is because in many developing countries, protection from imports is much higher for industrial than for agricultural goods, often implying negative real rates of protection for agriculture. This situation favours imports of food (or other agricultural products) and discourages production. If this discrimination against agriculture were attenuated, the economic advantage of importing would shift from food towards industrial products, thus favouring domestic food production and increasing self-sufficiency". Ed. N. Alexandratos (1988): World Agricultural Towards 2000: Belhaven London. pp 82, 84. A case in point is India where current devaluation of its currency has made internal prices of food (wheat and rice) much lower than their international prices.

12. For a detailed discussion of cropping pattern, technological development and agricultural

characteristic of traditional agriculture was that fertile river bed and coastal areas had much higher population pressure than the rainfed areas and there existed an inverse relationship between land productivity and land-man ratio.[13] Because of low yield levels and low growth ratios of agricultural and food output, their existed a precarious balance between population growth and food growth in most Asian countries. The only two exceptions were Burma and Thailand which had notable rice surpluses. The balance between popultion growth and food was often brought about through cruel Malthusian adjustment proceses and many countries often faced famines and starvation.[14] The relatively more rapid growth of population during the second half of the century led to increasing population pressure on land, lower land-man ratio and greater urgency to increase foodgrains output.

On gaining independence in the post-world war period, most of the countries in the Asia were faced with the difficult challenge of increasing their food output. Many of these countries undertook land reforms that made institutional structures less rigid, abolished intermediary interests, provided security to tenants and in some cases (like China), succeeded in making land distribution more equitable. The land reforms had varying degrees of success not only in different countries, but in different regions of the same country depending on the relative strength of the peasant movements versus that of landed interests. Other important steps taken by almost all the countries were investment in rural infrastructure including creation of scientific base and extension services. The result was that during the period 1955-65, for which comparable data are available for paddy and wheat, the crops recorded fairly high growth rates in production almost in almost all these countries (see Table 3 and Table 4). Thus Malaysia recorded an annual growth rate of 5.5 per cent in paddy output, Pakistan of 4.5 per cent, China 3.5 and Thailand 3.4 per cent during 1955-65. Indonesia was the only country whose growth rate was less than 2 per cent. In most cases, the major source of growth of paddy output during this perid was area increases rather than yield increases. China and Bangladesh were however, two exceptions where a dominant contribution was made by yield growth rates. Further, during this period agricultural price policy was hardly used as an instrument for either stabilising agricultural production or for providing insurance through minimum support price by these countries. The population explosion by most countries started exerting significant pressure and food situation came under severe strains in several countries by the early `sixties and countries like China, India, Pakistan and Indonesia had to resort to large scale food imports. (See Table 5).

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growth in these countries in the context of their food security, see Tyagi, D.S. op.cit., pp 17-54.

13. Bhalla, G.S., Alagh, Y.K. and Bhaduri, A. (1978) "Agricultural Growth and Manpower absorption in Indian Agriculture" in Bordhan et al (Eds); Labour Absorption in Indian Agriculture. ARTEP. ILO. Bangkok

14. For India see Bhatia, B.M. (1967) Famines in India 1860-1965, Bombay. Asia. and Sen, A. (1981): Poverty and Famines - An Easy an entitlement and deprivation. Delhi. Oxford.

The period from mid `sixties to mid `seventies was characterised by mixed performance in paddy production by various countries of the region. While growth rates of paddy production declined significantly in China, Burma, Thailand and Bangladesh, these showed notable acceleration in Indonesia, Philippines, Malaysia and Pakistan. India and Pakistan were able to adopt the new seed-fertilizer technology in wheat and recroded phenomenal ratio of growth in its production during this period (Table 4).

The 1965-1975 period is characterised as the green revolution period in the Asian countries. An important characteristic of agricultural and foodgrains growth of the region during this period was that except for Thailand and Malaysia where area growth continued to prodominate, in all yield rather than area became the main source of growth in all the other countries. Yield increases were achieved through much larger use of modern inputs like irrigation, HVY seeds and fertilizers. The growth rates of production and yield in paddy and wheat recorded by these countries during 1973-83 period bring out that most of Asian countries were able to consolidate their gains and achieve creditable growth rates through large scale adoption of new seed-fertlizer technologies.In paddy the performance of Indonesia, Burma, Sri Lanka, Philippines and Pakistan was truly creditable.

A comprehensive idea about agricultural performance of these countries during different periods can also be had from Table 5, which gives growth rates of gross domestic product originating in agriculture, total agricultural production, foodgrains and cereals production during the periods 1961-70, 1970-80, and 1980-88.

It is clear that most of the Asian countries were able to record satisfactory growth rates in agricultural and food production during all the periods. The exceptions are Bangladesh, Nepal and Sri Lanka and Malaysia where growth rates have been fluctuating widely. Most countries have registered a notable acceleration in their growth rates during the post-1980 period. Many countries viz. China, Burma, Pakistan, India and Indonesia have recorded growth rates exceeding 3 per cent per annum.

Table 3
Paddy Yields and Annual Compound Growth Rate of Paddy Production, Area and Yield

	Paddy Yields (ton/ha)				Growth Rates (Per cent)								
	1955	1965	1973	1983	1955-65			1965-75			1973-83		
					Prod-uction	Area	Yield	Prod-uction	Area	Yield	Prod-uction	Area	Yield
South Asia													
Bangladesh	1.4	1.7	1.7	2.0	3.09	1.10	1.98	1.07	0.61	0.44	2.2	0.70	1.5
						(35.6)	(64.1)		(56.1)	(42.1)		(31.8)	(68.2)
Burma	1.5	1.6	1.7	3.1	2.90	1.93	0.94	0.83	0.13	0.70	6.5	-0.6	7.1
						(66.6)	(32.4)		(15.7)	(84.3)		(-9.23)	(109.2)
China	2.8	3.9	4.0	5.1	3.51	-0.03	3.53	0.14	-0.30	0.45	3.1	-0.9	4.0
						(-0.8)	(100.6)		(221.4)	(321.4)		(-29.03)	(129.03)
Nepal	0.9	1.9	1.7	2.1	6.37	-1.72	8.24	1.45	3.02	-1.43	-1.1	-0.2	-1.3
						(-27.0)	(129.4)		(208.3)	(-108.3)		(-18.2)	(-118.2)
India	1.3	1.5	1.7	2.2	2.59	1.26	1.30	2.47	0.61	1.86	2.5	0.5	2.0
						(48.6)	(50.2)		(24.7)	(75.30)		(20.1)	(80.0)
Sri Lanka	1.6	1.9	2.3	2.4	5.02	2.88	2.10	5.37	3.16	2.37	6.5	2.8	3.7
						(57.4)	(41.8)		(58.8)	(44.1)		(43.1)	(56.9)
Pakistan	1.3	1.5	2.4	2.6	4.52	3.25	1.21	7.62	1.11	6.44	4.2	2.8	1.4
						(71.9)	(26.8)		(14.6)	(84.5)		(66.7)	(33.3)
Southeast Asia													
Indonesia	2.0	2.1	2.7	3.8	1.42	0.90	0.51	4.64	1.84	2.76	5.4	1.00	4.3
						(63.4)	(35.9)		(39.7)	(59.5)		(18.5)	(79.6)
Thailand	1.6	1.9	1.9	2.0	3.43	1.73	1.73	2.09	1.84	0.23	2.6	2.0	0.6
						(50.4)	(50.4)		(88.0)	(11.0)		(76.9)	(23.1)
Philippines	1.2	1.3	1.6	2.5	2.41	1.15	1.20	3.24	1.05	2.15	4.0	0.5	4.5
						(47.7)	(49.8)		(32.4)	(63.3)		(12.5)	(112.5)
Malaysia	2.1	2.5	2.9	2.9	5.45	3.41	1.97	6.47	4.67	1.72	-0.2	-0.6	0.4
						(62.6)	(36.15)		(72.2)	(26.6)		(-300.0)	(200.0)

Source: For 1955-65 and 1965-73, Asian Development Bank, Asian Agricultural Survey 1976: Rural Asia: Challenge and Opportunity. Manila, 1977. For 1973-83, R.B. Singh and H. Tsutsui, `Green Revolution in the Asia Pacific Region in Retrospect and Prospect', in Text Papers for Yokohama Farm for the 21st Century. Yokohama City University, 27-29 March 1985.

Note: Figures in parenthesis are percentage contribution of area and yield to production growth.

Table 4

Wheat Yields and Annual Compound Growth Rate of Wheat Production, Area and Yield

	Wheat Yields (ton/ha)				Annual Growth Rates (Per cent)								
	1955	1965	1973	1983	1955-65			1965-75			1973-83		
					Prod-uction	Area	Yield	Prod-uction	Area	Yield	Prod-uction	Area	Yield
India	0.7	0.9	1.3	1.8	2.50	1.36 (54.4)	1.09 (43.6)	10.69	4.69 (43.9)	5.68 (53.1)	6.1	1.2 (19.7)	3.8 (62.3)
Pakistan	0.7	0.8	1.2	1.7	2.14	1.87 (87.4)	0.30 (14.0)	7.49	1.41 (18.8)	5.93 (79.2)	5.5	2.5 (45.5)	3.0 (54.5)

Source: As given in Table 3.
Note: Figures in parenthesis are the percentage contribution of area and yield to production growth.

Table 5

Growth Rates of Agricultural GDP, Agriculture, Food and Cereal Production

	Growth Rates of AGDP (1980 US$)			Growth Rate of Agricultural Production		Growth Rates of Food			Growth Rates of Cereals		
Country	1961-70	70-80	80-88@	1961-70	70-80	1961-70	70-80	80-88[b]	1961-70	70-80	80-88[c]
South Asia											
Bangladesh	2.54	2.68	2.1	2.59	2.12	2.71	2.18	0.72	2.41	3.06	2.44
Burma	5.17	4.51	-	1.93	2.54	1.91	2.53	4.14	1.23	4.72	1.00
China (ex Taiwan)	4.42	1.16	6.8	6.18	3.38	5.82	3.46	4.89	6.43	3.68	2.85
Nepal	0.39	0.93	4.4	1.62	1.03	1.59	1.06	1.82	1.02	0.29	4.04
India	1.10	2.09	2.3	1.81	2.51	1.91	2.54	2.84	2.72	2.59	3.19
Sri Lanka	1.33	3.25	2.7	2.34	3.83	2.89	5.71	0.01	5.42	2.69	0.58
Pakistan	6.37	2.39	4.3	4.39	2.84	4.19	3.15	3.52	7.01	4.07	1.60
Southeast Asia											
Indonesia	1.90	3.77	3.1	2.42	3.59	2.48	3.62	3.91	4.75	3.95	4.78
Thailand	5.55	5.53	3.7	4.35	4.43	3.89	4.52	2.40	3.30	2.71	2.38
Philippines	4.14	5.07	1.8	2.56	5.69	2.60	5.53	0.64	4.16	5.27	2.39
Malaysia	0.34	6.18	3.7	5.62	4.35	5.57	5.06	1.82	4.65	0.13	-2.24

Source: FAO, Growth Equity and Poverty in the Far East - Performance of Countries, Mimeo, 1986.
@ Calculate from the World Bank Development Report 1990.
b Calculated from AOB Report, 1989.
C Calculated from FAO Year Book, 1990 by Table 3 years average of area, production and yield.

Table 6

Changes in Agricultural Land, Irrigatd Area and Fertilizer Consumption

	Agricultural Land (000 hectares)			Irrigated Land (000 hectares)			Irrigated Land Percentage of Agricultural Land			Chemical Fertiliser per Hectare of Agricultural Land (All Type of Fertiliser as Nutrients in kg)		
	1966	1976	1986	1966	1976	1986	1966	1976	1986	1966	1976	1986
South Asia												
Bangladesh	9050	9124	9164	620	1406	2098	6.85	15.41	22.89	8.4	26.7	67.3
Burma	10366	10000	10073	773	985	1059	7.46	9.85	10.51	1.2	5.1	20.7
China	-	100580	97778	-	43571	44653	-	43.32	45.67	-	63.8	179.7
Nepal	1831	2336	2321	105	290	650	5.73	12.41	28.01	1.9	6.4	20.5
India	162720	168190	168770	26660	34490	44350	16.38	20.51	26.28	7.4	20.1	57.1
Sri Lanka	1874	1903	1887	398	483	607	21.24	25.38	32.17	55.7	50.1	101.5
Pakistan	19537	19760	20600	12029	13830	15650	61.57	69.99	75.97	5.7	32.0	82.8
Southeast Asia												
Indonesia	17600	19418	21220	4176	4900	7260	23.73	25.23	34.21	6.8	25.4	98.0
Thailand	12865	16988	19863	1768	2448	3900	13.74	14.41	19.63	5.2	14.0	23.4
Philippines	-	7440	7930	740	1070	1450	-	14.38	18.28	11.3	36.1	49.2
Malaysia	3750	4250	4375	238	312	336	6.35	7.34	7.68	21.5	70.3	157.0

Source: For 1966 and 1976 figures, as in Development Bank, 'Agriculture in Asia,' Statistical appendices, Manila, 1985.
For 1986 figures, FAO, 'Selected Indicators of Food and Agricultural Development in Asia Pacific Region, 1977-88', Bangkok, 1988.

As indicated earlier the most important reason for maintaining satisfactory growth performance in agriculture by these countries has been widespread adoption of new seed-fertilizer technology. This has led to much larger increase in irrigation and the use of fertilizer in the production process. Table 6 gives some details.

To sum up, in most of the countries of South and South East Asia, performance of agriculture has been fairly satisfactory since the mid `sixties after the introduction of new agricultural technology. But this should not lead to euphoria and a sense of complacency as most of these countries have only attained marginal self-sufficiency in foodgrains production and their levels of per capita food availability continue to be quite low.

Some serious problems are likely to be faced by these countries in coming years to meet increased demand generated because of much higher expected growth in per capita income and increasing population (although with expected slow growth rates). First, during the coming years, these countries will have to accelerate agricultural production through much higher investment. According to an estimate made by the FAO, investment should rise from $ 21.5 in 1990 to $ 28 in year 2000.[15] This will require mobilisation of much greater savings from domestic resources particularly by the governments for public investment in rural infrastructure. This will prove difficult for many soft states which for populist reason are unable to raise sufficient resources. Further, the climate for international aid is also not as favourable as it used to be earlier. Consequently, many countries may not be able to undertake adequate investment in agriculture.

Second, with increasing population, land-man ratio is bound to decline further. In some countries of the region where the pace of sectoral diversification is low, marginal and small farmers will continue to preponderate because of inequality in land distribution. Agricultural growth will have to be achieved through appropriate production technology that actively involves these sections in the growth process. This is a challenging job.

Third, so far the technological breakthrough has resulted is much higher land yields without necessarily raising labour productivity. Labour productivity will have to rise significantly if rural incomes have to rise and diversification of the economy is to take place.

Fourth, there is also a need for another technological breakthrough as the current technology is becoming increasingly high cost because of larger use of petroleum based inputs and a plateau seems to have been reached in its productivity and profitability. Moreover, in the light of increased demand for livestock products what is needed is a major breakthrough in the production of coarse cereals. One of the limitation of green revolution has been that so far it has been confined to irrigated areas and to fine cereals i.e. rice and wheat. No suitable technology has been found for the unirrigated and semi-arid zones and for coarse cereals grown in these regions. This ought to be on high agenda for countries like China, India, and Pakistan, that have large tracts of areas exclusively dependent on rains. To sum up, to meet the future needs of providing food security, these countries will have to devote much greater attention to the agricultural sector through larger investments in rural infrastructure including Research and Development for developing new technologies.

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15. FAO: Agricultural Towards 2000 op.cit.

Food Security and Self-Sufficiency Ratios

Having discussed in detail the past trends and future prospects of their food demand on the one hand and their domestic food supply on the other, it is now possible to look at the state of food security and self-sufficiency ratios in various South and South East Asian countries. A juxtaposition of Table 2 that contains estimates of normative food demand with Table 5 that gives the growth rates of food and cereal production should give an idea about the extent to which food needs of these countries have been satisfied out of domestic production. (See Table 7). It is obvious that with a few exceptions, the performance of various countries in the matter of meeting normative food demand has not been very satisfactory. During the `sixties, the only two countries where output growth exceeded growth of normative demand were China and Malaysia while the two were nearly equal in the case of Pakistan, Bangladesh and Indonesia. By the `eighties, the growth in food demand in China, Thailand and also India and Pakistan had outstripped output growth. The above estimates are based on the assumption of income elasticity being 0.4. If one were to assume an income elasticity of demand for foodgrains of 0.6, one finds that in most of the Asian countries normative demand for foodgrains outstripped the supply throughout the period.

Table 7

Annual Compound Growth Rates of Nomative Food Demand and Supply

Country	Growth Rates of Food								
	1969-70			1970-80			1980-88		
	Demand			Demand			Demand		
	A	B	Supply	A	B	Supply	A	B	Supply
Bangladesh	2.9	3.2	2.71	3.1	3.4	2.18	3.2	3.3	0.72
Burma	2.5	2.5	1.91	3.3	3.7	2.53	3.3	3.8	4.14
China	3.2	3.9	5.82	3.4	4.2	3.46	4.9	6.7	4.89
Nepal	2.1	2.2	1.59	2.5	2.5	1.06	3.4	3.9	1.82
India	2.8	3.1	1.91	2.7	3.0	2.54	3.4	3.8	2.84
Sri Lanka	3.3	3.7	2.89	2.6	3.1	5.71	2.6	3.2	0.01
Pakistan	4.4	5.1	4.19	3.7	4.1	3.15	4.5	5.2	3.52
Indonesia	2.8	3.1	2.48	4.4	3.5	3.62	3.3	3.9	3.91
Thailand	5.2	6.2	3.89	4.4	5.3	4.52	3.5	4.4	2.40
Philippines	3.8	4.3	2.60	4.0	4.8	5.53	1.5	1.1	0.64
Malaysia	4.3	5.0	5.57	4.6	5.6	5.06	3.4	3.4	1.82

Source: Derived from tables 1 and 5.

A Calculated on the assumption of income elasticity for food of 0.4 in addition to growth of population.

B Calculated on the assumption of income elasticity for food of 0.6 in addition to growth of population.

Another estimate about food self-sufficiency can be had from data on actual imports of foodgrains by the countries of South and South East Asia over the years. To begin with, immediately before the War, Burma, Thailand, Korea and Taiwan exported nearly 8.1 mm tonnes of rice each year. On the other hand, Sri Lanka, China, India, Indonesia, Japan, Malaysia, Hongkong and Singapore imported about 5.9 mm tonnes annually.[16] There was serious disruption in production and imports during the war. Many countries were unable to fulfill their demand after independence and imported much less because of limited resources. Thus during 1948-52, total food imports by these eleven countries amounted to only 2.47 mm tonnes. (See Table 8). During 1961-65, due to easy availability through PL480, their food imports increased to a high of 15.54 mn tonnes. It is notable that India and China were the main importers having imported annually an average of 5.38 and 5.85 mm tonnes respectively during that period. Pakistan and Indonesia were also importing 1 mn tonne of foodgrains each during this period. While India was able to considerably reduce its dependence on imports after 1970 through increased production, the annual imports of foodgrains by China increased to 16.1 mm tonnes during 1970-74, 22.8 mm tonnes during 1976-80 and 26.1 mm tonnes during 1982-86 inspite of a notable acceleration in domestic food production in that country. This has happened primarily because of unprecedented growth in the per capita income in China since the early `seventies. The better self-sufficiency ratio for India is no doubt partly due to satisfactory growth of domestic output. But in part, it is also a reflection of low levels and growth of demand because of low per capita income and limited purchasing power of Indian population. Currently, the other two importers of foodgrains are Malaysia and Indonesia, while Thailand and Burma are the main Asian exporters (of rice).

16. Mohinder Singh (1975): Problems of Hunger and Malnutrition in Developing Countries, University of British Columbia. Vancouver. p 2.

Table 8

Annual Average Net Availability of Cereals in Selected South and Southeast Asian Countries: 1948-52 to 1982-86

(in million tonnes)

	Pro-duction	Im-port	Ex-port	Net availa-bility	Pro-duction	Im-port	Ex-port	Net availa-bility	Pro-duction	Im-port	Ex-port	Net availa-bility	Pro-duction	Im-port	Ex-port	Net availa-bility	Pro-duction	Im-port	Ex-port	Net availa-bility
South Asia																				
Bangladesh	-	-	-	-	-	-	-	-	14.4	1.8	-	16.2	19.7	1.5	-	21.2	23.3	1.9	-	25.2
Burma	5.59	-	0.25	5.34	7.94	0.03	1.58	6.39	7.2	-	0.4	6.8	10.9	-	0.7	10.2	15.9	-	0.7	15.2
China	113.52	0.22	0.12	113.62	161.63	5.85	1.00	166.48	203.2	7.5	2.6	208.1	268.0	12.2	1.5	278.7	343.9	15.4	4.0	355.3
Nepal	3.46	-	-	3.46	3.22	-	0.21	3.01	3.5	-	0.2	3.3	3.6	-	0.1	3.5	4.0	-	-	4.0
India	56.06	1.16	0.01	57.21	87.55	5.38	-	92.93	103.9	3.3	0.2	107.0	133.9	1.9	0.5	135.3	159.8	1.7	0.4	161.1
Sri Lanka	0.51	-	-	0.51	0.98	0.80	-	1.78	1.5	0.1	-	1.6	1.8	1.1	-	2.9	2.5	0.8	-	3.3
Pakistan	17.20	0.07	0.11	17.16	22.36	1.00	0.23	23.13	11.6	0.8	0.5	11.9	15.5	1.1	1.0	15.6	18.7	0.8	1.1	18.4
Southeast Asia																				
Indonesia	11.28	0.38	0.01	11.65	15.52	1.00	-	16.52	21.0	1.7	0.2	22.5	29.2	2.8	-	32.0	41.8	2.0	0.1	43.7
Thailand	6.88	-	0.52	6.36	12.10	0.04	2.37	9.77	14.0	0.1	3.1	11.0	18.7	0.1	4.6	14.2	23.4	0.2	7.4	16.2
Philippines	3.46	0.10	0.01	3.55	5.26	0.68	-	5.94	6.5	0.9	-	5.6	10.4	0.9	0.1	11.2	12.0	1.3	-	13.3
Malaysia	0.64	0.54	0.05	1.13	1.15	0.76	0.02	1.89	1.9	0.9	-	2.8	1.9	1.2	-	3.1	1.8	2.0	0.1	3.7

Source: FAO, Production Year Book and Trade Year Book.

\- Negligible.

An alternative estimate of the self-sufficiency ratios for the Asian countries prepared by the FAO is given in Table 9. During 1961-65, the ratio was highly adverse for most countries like China, India, Sri Lanka, Pakistan, Indonesia, Philippines and Malaysia. The only surplus countries were Burma and Thailand. Many important changes have taken place in this position over time. By 1982-86 India, Pakistan, Nepal had become near self-sufficient. The lowest self-sufficiency ratio of 48.65 per cent was obtained for Malaysia followed by Sri Lanka whose ratio was 66.67 per cent during 1982-86. Other countries which continue to have low ratios are Bangladesh, Philippines, Indonesia and China. Philippines which had improved its position between 1961-65 and 1976-80 has shown a deterioration during 1982-86. The visible improvement in the self-sufficiency ratios of many Asian countries is parimarily due to the effective agricultural development programmes undertaken by these countries. In a few cases, it is also a reflection of unfulfilled demand of the poorer sections of their population.

Further, most of the data on food production and availability and demand and self-sufficiency ratios analysed so far fail to give satisfactory picture of food security in these countries. This is because genuine food security can only be judged in terms of availability of adequate calories to the population. Table 10 prepared by the FAO gives estimates of available calories per day as percentage of requirements in the Asian countries during different periods.

It is clear that during 1961-63, the position regarding average calorie intake was not very satisfactory for many Asian countries. Thus, China and Pakistan were able to provide only 75 per cent of standard calorie requirements during 1961-63 despite high degree of self sufficiency. Other countries which were extremely deficient in terms of calorie intake during 1961-63 were Bangladesh, Burma and Philippines. The position had visibly improved in most of the countries by 1969-71 and China and Pakistan were able to provide 83.6 and 87.7 per cent of their calorie requirements.

Table 9
Degree of Self-sufficiency in Foodgrains in Asian Countries: 1961-65 to 1982-86

Country	Self-sufficiency Ratios			
	1961-65	1970-74	1976-80	1982-86
South Asia				
Bangladesh	-	88.99	93.03	92.54
Burma	124.55	106.47	105.84	104.40
China	97.08	97.66	96.17	96.73
Nepal	106.98	106.06	102.86	97.56
India	94.21	97.13	99.01	99.16
Sri Lanka	55.06	93.75	62.07	66.67
Pakistan	96.71	97.65	98.23	101.41
Southeast Asia				
Indonesia	93.95	93.24	91.12	95.69
Thailand	103.42	126.26	132.53	144.80
Philippines	88.55	87.33	92.20	90.36
Malaysia	62.16	67.86	61.86	48.65

Source: FAO: Production Year Book, Various Issues, Rome.

Table 10
Dietary Energy Supply: 1961-63 -- 1983-85

		Food Supply: Calories per Capita per Day					
	Normative	1961-63		1969-71		1983-85	
	Requirement of Calories per Capita per Day	Calories per Capita per Day	Percentage of Requirements	Calories per Capita per Day	Percentage of Requirements	Calories Capita per Day	Percentage of Requirements
Southeast Asia							
Bangladesh	2310	1938	83.9	2013	87.1	1906	82.5
Burma	2160	1823	84.4	2069	95.8	2565	118.8
China	2360	1712	72.5	1974	83.6	2608	110.5
Nepal	2200	1878	85.4	1996	90.7	2051	93.2
India	2210	2038	92.2	2021	91.4	2185	98.9
Sri Lanka	2220	2081	93.7	2260	101.8	2414	108.7
Pakistan	2310	1704	73.8	2027	87.7	2223	96.2
Southeast Asia							
Indonesia	2160	1742	80.6	2012	93.1	2489	115.2
Thailand	2220	2012	90.6	2258	101.7	2303	103.7
Philippines	2260	1837	81.3	2053	90.8	2328	103.0
Malaysia	2230	2263	101.5	2409	108.0	2686	120.5

Source: FAO, Production Year Book, Vol. 40, 1986.

A further improvemnt in calorie intake took place during the `eighties when except for Bangladesh and Nepal (and to a margional extent India and Pakistan), all the other countries were able to provide adequate (and even more) calorie requirements to their population. Acceleration in food production in most countries (combined with very large imports by China and some imports by Indonesia and Malaysia) during the `eighties has helped the position of calorie intake by the people in most Asian countries.

It may, however, be underlined that average calorie intake of population fails to provide a correct picture of mal-nutrition prevailing among the poor and vulnerable section of population in many of these countries. This aspect will be studied in a later part.

Part IV - Instability in Food Production

In most of the Asian countries foodgrains production is characterised by a great deal of year to year instability. Whereas earlier this instability was fully attributed to vagaries of monsoons, some recent studies indicate that variability in total production has not declined even in East Asia where irrigation is fairly developed and where new technology has been extensively adopted.[17] But this finding is not borne out by some other studies. For India, several scholars have found that the amplitude of fluctuations in food production is much smaller in irrigated states compared with the rainfed regions. For the same reason fluctuations in the production of coarse cereals are found to be much greater than that for wheat and rice. The fluctuations seem to became wider in unirrigated areas which extensively use fertilizers and other modern inputs. Another notable finding about India is that because of concentration in irrigated areas, there is lesser fluctuations in the arrival of marketed surpluses compared with production. However, for the country as a whole there is some evidence of increase in the amplitude of fluctuations.[18]

Instability in food production has come serious implication for the economy and food security in these countries. First, large variability in food production makes it difficult to maintain stability in food consumption by their population. Second, a fall in agricultural production adversely affects the income levels of large number of households whose fortunes are directly or indirectly dependent on agriculture. Under these conditions, a large section of small and marginal farmers, landless labour and rural artisans and other vulnerable sections can face serious problem of entitlement to food due to erosion in their purchasing power. Third, a fall in food production generally leads to higher prices of food which ih turn adversely affects the food security of vulnerable sections of population in these countries. Fourth, agricultural instability adversely affects budgetary resources of

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17. Barker, R., Gabler, E.C. and Winklemann, D. (1981): "Long Term Consequences of Technological Change on Crop Yield Stability - The Case of Cereal Grain" in Valdes, A. (Ed) Food Security for Developing Countries. Colorado. Westview Press.

18. Hazell, Peter. B.R. (1982). Instability in Indian Foodgrains Production. Washington D.C. International Food Policy Research Institute. Research Report 30.

almost all the countries of Monsoon Asia. A fall in production leads to more expenditure on public distribution thereby putting a strain on the budget and leading to a reduction on infrastructural investment in agriculture. This can have serious long term implications. Further, foreign exchange resources can come under severe strain if domestic shortages are sought to be made up through imports.

The two commonly employed methods of counteracting the impact of instability in domestic food production are carrying of large stocks and/or foodgrains imports through food aid or trade. There is an obvious trade off between the two. While carrying large stocks is more costly than earmarking a part of foreign exchange resources for food imports, in practice developing countries can seldom succeed in opting for the latter alternative. This is because they suffer from chronic balance of payment difficulties. Past experience shows that keeping food reserves is the most reliable method of providing food security in particular for big countries like India and China.

The second method of counteracting instability and providing stable food security is through imports. Most small Asian countries follow this method. Food Imports through trade have to be financed out of scarce foreign exchange earnings or through aid. Food Aid can be useful and in the past, food imports under PL 480 played an important role in providing food security in many Asian countries (although these did have depressing effect on domestic food production). However, the prospects of large scale food aid have become fairly bleak. For example, whereas food aid constituted 23.3 per cent of total food imports by the Far Eastern countries during 1976-77, its share was expected to fall to only 11.1 per cent by 1987-88. (Table 11). The main method of financing food imports is therefore, going to be through trade. It may be noted that contrary to general expectations, food imports may not always succeed in imparting stability in food availability. A study undertaken by Valdes at al has brought out that several Asian countries were unable to stabilize their food consumption through imports.[19]

Providing stability in food security in the face of variability in domestic food production is one area where because of heavy costs of food reserves, regional and international cooperation can play a major role and can lead to considerable savings. One would have expected better prospects for stability in food security through international action because of improved transport and communication, increased world output, large world reserves and increased use of food grains for animal feed.

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19. Valdes, A. and Konandreas, P. (1981) "Assessing Food Insecurity Based on National Aggregates in Developing Countries" in (Ed) Valdes, A. op. cit.

Table 11

Cereal Imports and Food Aid Flows to Developing Countries

(Percent)	Total Cereal Imports (in million tons)				Of which: Food Aid (in thousand tons)				Share of Food Aid in Total Imports			
	1976-77	1985-86	1986-87 (prel.)	1987-88 (forecast)	1976-77	1985-86	1986-87 (prel.)	1987-88 (forecast)	1976-77	1985-86	1986-87 (prel.)	1987-88 (forecast)
Total Developing	55.6	97.7	110.0	110.7	8586	10738	12034	11200	15.5	11.0	10.9	9.2
Food Deficit	54.0	95.8	109.4	109.9	8243	10260	11490	10900	15.2	10.7	10.5	9.9
Low Income@	26.8	40.9	45.4	52.0	6974	9370	10026	9520	26.1	22.9	22.1	18.3
Africa	9.3	19.4	19.0	19.7	3031	5644	5469	5300	32.6	29.1	28.8	26.9
Far East	16.1	18.5	23.1	28.8	3760	2488	3541	3200	23.3	12.7	15.4	11.1
China	2.3	12.5	16.1	17.9	-	290	559	500	-	2.3	3.5	5.6
India	7.1	0.3	0.2	1.7	1176	257	208	300	16.5	92.8	95.4	17.6
Latin America	0.9	1.3	1.7	1.7	122	1003	823	800	13.5	76.9	47.2	47.1
Near East	0.3	1.4	1.4	1.5	59	234	192	190	19.4	17.2	14.0	12.7
Oceania	0.1	0.3	0.3	0.2	2	1	2	2	2.0	0.4	0.8	0.8
Others	27.3	54.9	64.0	58.0	1271	890	1464	1380	4.7	1.6	2.3	2.4
Africa	3.3	7.6	8.5	8.0	141	153	454	450	4.3	2.0	5.3	5.6
Far East	6.4	10.8	12.0	12.2	702	-	-	-	11.1	-	-	-
Latin America	12.6	16.0	19.2	15.9	121	597	900	820	1.0	3.7	4.7	5.2
Brazil	3.8	3.6	5.8	3.2	5	6	5	4	0.1	0.2	0.1	0.1
Mexico	1.0	3.1	4.6	4.0	-	11	4	3	-	0.4	0.1	0.1
Near East	4.9	20.3	24.1	21.7	294	141	109	100	6.0	0.7	0.5	0.5
Oceania	0.1	0.2	0.2	0.2	13	-	1	1	11.8	-	0.5	0.5

Source: FAO, Committee on World Food Security (1988) Assessment of the Current and Long-Term Trends in World Food Security, Rome, CFS: 88/2, Table -2, p.8.

@ Includes all food-deficit countries with per caput income below the level used by the World Bank to determine eligibility for IDA assistance (i.e. with per caput income of US $ 835 and below in 1986) which in accordance with the guidelines and criteria agreed by the CFA should be given priority in the allocation of food aid.

* Food deficit developing countries other than low-income.

However, this has not happened and so far international action has been in the nature of good intentions and only a few steps have been initiated. To date, internatiohnal cooperation is insufficient both in quantum and scope.

Currently, there are some new international initiatives which may prove more effective. The important among these are: (i) the IMF's Food Financing Facility which provides foreign exchange for food imports. However, this Facility constitutes a part of the country's quota and is not an additionality. (ii) the 1980 Food Aid Convention which has increased annual food aid commitment to 7.6 mm tonnes compared with 4.2 mm tonnes under the earlier 1971 Convention (iii) The International Emergency Food Reserves of 0.5 mm tonnes during 1981 (iv) The Global Information and Early Warning System of the FAO (v) The Food Security Assistance Scheme of the FAO under which nearly 0.5 mn have been pledged.

All these measures are in the right direction, but these are highly inadequate. The Asian Emergency Food Reserve under which a reserve of 50,000 tonnes of rice is to be kept is a welcome initial step in Asia. There is need to develop collaborative mechanisms of food security for the Asian countries. SAARC and ASEAN should study the feasibility of developing programmes of food security for Asian countries in collaboration with the Asian Development Bank, the FAO and the IMF.

In conclusion, one could agree with Vyas that the programme of food security has to be three tier programme - national, regional and global. In the imprerfect world in which we live, it is the national reserves which will have to be given the greatest emphasis. As a rule the big countries which are price takers should have national stocks to take care of their normal production variations. Regional and Global reserves should aim at meeting variations that are above normal partly through food aid and mainly through trade which should be facilitated by adequate payment facilities especially for the poor countries.[20]

Having discussed the problem of instability of food production, the next part is devoted to the problem of access of food to a large number of poor and vulnerable people that abound in the countries of South and South Asia.

Access to Food by the Poor

Inspite of enormous economic progress recorded by the developing countries during the last four decades and a notable reduction in the incidence of poverty, an estimated one billion people were still living in poverty in these countries. It should be a matter of concern that nearly 73 per cent of the world's poor live in Asia. Most of the poor are concentrated in rural areas although in some countries urban poverty is also widespread. Among the rural areas, it is the densely popoulated regions with slow growth in agriculture where incidence of poverty is the highest.

There are wide differences in the institutional structure in land in the countries of

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20. Vyas, V.S. "Food Policies and Food Security in Asia" in Tyagi, D.S. and Vyas, V.S. (Ed) (1990) op.cit. p 435-441

South and South East Asia. While radical land reforms have brought about more or less equitable distribution of land in China, in most other countries land reforms have been half-hearted. Consequently, in many of these countries the land distribution is extremely skewed. Increasing population pressure has led to a perceptible decline in land-man ratios and this combined with unequal land distribution has resulted in large scale existence of marginal and small farmers and landless labour.

Although with the advent of green revolution the marginal and small farmers as well as the landless labour have also been able to share the benefits of technological change in many of these countries, their assets base is so small that their total income gains are only limited. It is also true that green revolution has brought in its wake large agricultural and non-agricultural activities and the poorer sections of the peasentary are able to obtain relatively larger gainful employment from wage labour. But despite these developments, there exists large incidence of poverty among the small and marginal farmers and landless labour as also among rural artisans. These countries also have large scale urban poverty in particular among the urorganised labour and those engaged informal sector in the urban areas. Hence, the question of food security is not merely to increase food output, but also to make it available to vulnerable sections of population in these countries.

The only sure way of access to food by vulnerable section is to draw them into the production process that gives them adequate income and purchasing power. This means that the process of development should be strengthened and these sections should be able to obtain much higher incomes from their current or prospective occupations. A wide range of policies like land reforms, general employment creating measures, agricultural development, and industrial growth can all make an important contribution towards alleviation of poverty. But this requires much more accelerated and widespread growth of a type that does not bypass but actively involves the vulnerable rural and urban poor in the development process. It needs to be underlined that it takes time for growth oriented policies to yield results. In the mean time, there is need to directly intervene to provide food security to the poor, specially for those disadvantaged people in certain regions who are not in a position to make use of growth opportunities.[21] The question, therefore, is how to intervene in the process whereby food security can be provided to these sections.

Most Asian countries have attempted various ways of doing so. The first step in any such programmes is to identify the food insecure households. Several methods like income criteria, land ownership, anthropometric indicators, occupation, employment, regional backwardness etc have been employed to identify the poor. None of these is, however, fool proof and while some deserving poor may be left out, it is possible for better off households to be included.

The various types of policy interventions usually employed in the South and South Asian countries can be classified into three groups; the market intervention programmes;

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21. FAO, Committee on World Food Security, (1988), Measures to Improve Access to Food by the Poor. Rome CFS 88/4. pp 1,2

the income generating programmes and the employment programmes and special feeding programmes.

The most important objective of the market intervention programmes is to keep prices of basic staples like wheat and rice low for the poor households. This is generally done through the public distribution system. In many countries, consumer food prices are subsidised. Other methods to directly reach the poor are fair price shops, food rationing scheme, food stamps scheme (Sri Lanka) and commodity targetting. In general, the policy in Asian countries has been to maintain low cereal prices for consumers. One of the methods widely employed is public distribution or ration shops where food is made available at subsidised rates to vulnerable sections in rural and urban areas. But it is generally not possible to confine public distribution programmes for the poor and many leakages take place.

Another major limitation of market intervention programmes like the public distribution system is that these can bypass those who do not have adequate purchasing power. Some countries have, therefore, introduced various income generating schemes like Employment Guarantee Scheme, Rural Development Programme, Labour Intensive Public Works Projects, Food for Work Schemes etc. In India for example, the two most important programmes specifically designed for rural poor are the Integrated Rural Development Programe and the Jawahar Rozgar Yojana. In one of the states in India namely Maharashtra, there exists an Employment Guarantee Scheme for the rural labour. These schemes become important safety nets for the poor in many situations.

The third type of programmes namely special feeding programmes are also quite prevalent in Asian countries. These include speical distributional programmes that provide nutrition to vulnerable groups like children, pregnant women, the young,the sick and the old.

There are many difficulties in the organisation of policy intervention programes aimed at providing food security to the poor. Sometimes it is difficult to correctly identify the target group and hence benefits flow to richer sections also. This tends to make these programmes increasingly more costly. Quite often, the administrative costs involved are also large and in many countries only a fraction of total outlay may flow to the beneficiaries. Further, corruption and leakages can erode the success of these programmes. The direct involvement of local people can help in reducing administrative costs and leakages. But the success of decentralisation also depends on whether the poor are able to defend their rights at the local level village councils, which are generally dominated by the rural rich. Another problem arises regarding the types of assets to be generated in the employment programmes. Quite often, in the absence of matching material, the roads, school buildings, hospital rooms and other social assets created are of poor quality and last for a very limited period. The danger for these programmes degenerating into digging holes and filling them up is quite high.

The self employment programmes enable the beneficiaries to augment their productive assets and thereby obtain a future income stream. Many evaluation reports

about Indian programmes indicate that besides wrong identification, large scale leakages also take place. Hence, the quality of assets purchased has not been always of the right quality, thereby making repayment difficult. It is also discovered that these programmes are more successful in areas where rural infrastructure is developed and agriculture is advanced. The poorer people in poorer regions are generally at a big disadvantage. Nonetheless, in many Asian countries these programmes play a useful role. The question is how to make them more beneficiary oriented and less costly and how to reduce red tapism and leakages.

Part-VI Conclusions and Policy Recommendations

The analysis of food security in various countries of South and South East Asia undertaken above has brought out that inspite of serious difficulties faced by these countries on the food front during the early `sixties and the early `seventies, they were able to record significant growth in their food production afterwards. This has enabled them to achieve a fair degree of success in the matter of food policy. But in most cases, the per capita availability of foodgrains out of both domestic production and imports remains grossly inadequate. Population growth rates have started slowing down in most of the Asian countries during the recent decades. But with incomes rising very rapidly in a few countries like China, Malaysia and Indonesia since the mid `seventies, per capita demand of foodgrains has started increasing at a very rapid rate. Hence, inspite of notable acceleration in the growth rates of domestic production, food imports are also becoming an important souce of increasing their food availability. Most of these countries have also tried to meet the problem of instability in food production by maintaining adequate food reserves. The wisdom of this policy was brought home very clearly in the case of India during 1986, to 1988 when it faced three years of worst drought of the century. India was able to meet its requirements out of its own reserves without going to the international market for large imports.

These achievements notwithstanding, the countries of South and South East Asia cannot sit on their laurels because of their recent achievements. This is because of several reasons. First, despite satisfactory trend rates of growth, the per capita food and calorie availability remains highly inadequate in most of the countries. Second, these countries have not been able to find an appropriate solution to the problem of wide year to year fluctuations in their food output. Carrying of large reserves practiced by China and India is quite costly. In the absence of any satisfactory international initiative, this high cost mechanism seems to be the only alternative. Third, despite higher growth rates achieved in food production, these countries have not been able to devise fool proof mechanisms for providing access to food to a large number of poor who live in these countries. Most of these countries have initiated special employment and income generating programmes for improving the purchasing power of the rural and urban poor. Nevertheless, the problem of malnutrition remains serious. The measures taken so far are inadequate and also extremely

costly. These have led, in many cases, to large scale leakages and corruption. There is no easy solution to the problem of access of the rural and urban poor to food except through accelerating the development process and involving them in the production process.

The fourth serious problem is that inspite of higher production, many of these countries had to import large quantities of food grains over the years. China alone is currently importing nearly 15 to 18 mn tonnes of food grains annually. Malaysia and Indonesia have been importing another about 2 mn each annually. The surpluses originating in the region are not sufficient to meet the import demand of some of the rapidly growing Asian countries. As discussed earlier, with higher growth of per capita income, the total demand for food grains in some of the countries is likely to exceed domestic production by a large margin inspite of acceleration in growth rates of domestic food production. The increasing dependence on imports can create serious difficulties in the future. This is because while the current international prices of food grains are low because of huge subsidies being given by the developing countries (EEC, North America, etc.), to their produces, there are serious pressures on surplus developed countries to reduce their subsidies to the agricultural sector. This will make food imports much more expensive for the developing countries. While higher prices of agricultural commodities might create an appropriate price climate for further augmenting agricultural production by the developing countries of Asia, but this would - if at all - be a long drawn out process because of supply inelasticities of the agricultural sector in most of these countries. It is more or less established that aggregate agricultural production is not very responsive to rise in prices. Most of the studies indicate that supply response is much greater for infrastructural investment like irrigation, fertilizers etc. etc. Hence, the solution lies in the diversion of large resources for investment in rural infrastructure. It is, however, doubtful if in the current phase of liberalisation, more public investment could be devoted to investment in agriculture.

Fifth, rising import and domestic prices of food grains are bound to adversely affect the poor and vulnerable sections in these countries. Most of the South and South East Asian countries have so far deliberately pursued a policy of low food prices. This policy was devised in response to the existing reality of these countries where the purchasing power of a vast section of rural and urban population is very low. Although termed as conservative, this policy makes a great deal of common sense. Rise in food prices unaccompanied by any visible improvement in the purchasing power of the poor and of the vulnerable section in society is bound to hurt them and have deliterious effect on their living conditions.

Sixth, currently many of these countries including China and India are undergoing a process of economic liberslisation. Liberalisation is aimed at integrating the domestic economies with the world economies. While many low cost labour intensive emterprises and occupations may benefit, the policy is bound to administer a shock to numerous non-competitive domestic enterprises forcing these to either modernise or to close down. While the organised labour in registered manufacturing may be able to withstand the shock of

dislocation, the process is bound to adversely affect the unorganised poor labour working in numerous household enterprises and in the informal sector.

Further, liberalisation when accompanied by devaluation, would lead to higher domestic prices and inflation. It is the poor and the unorganised sections of society which will have to bear the brunt of not only inflation, but also of dislocation and unemployment. To what extent the existing employment programmes can take care of this problem is a matter of conjecture. The rising unemployment as a consequence of liberalisation along with high rates of inflation, in general, and perceptible rise in food grains prices, in particular, will need to be tackled on priority basis through the institution of proper mechanisms and safety nets. This is a challenging task.

Finally, as already emphasised, there is much greater scope for collaboration among the Asian countries in the mater of food security. It is possible for them to omplement each other's efforts since their production is fairly diversified. Similarly, it should be possible to explore the possibilities of building reserves at the regional level. This, however, needs more careful analysis.