

AGRICULTURAL DIVERSIFICATION IN PHILIPPINE DEVELOPMENT STRATEGY

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This paper discusses the significant role of agricultural diversification in the Philippine recovery program. It tackles certain aspects which were not taken up in the *Medium-Term Philippine Development Program, 1987-1992*. The urgent need for developing agricultural diversification in the Philippines is presented as a way of solving problems of growing rural underemployment particularly in the drier months, low peasant incomes, and poor nutrition among the low-income groups. Also, it examines the potentials for diversification as well as the obstacles confronting it. The Philippine experience is compared with those of other Southeast Asian countries to provide a broader perspective for policies and their implementation.

1. Significance and Concept of Diversification

This paper discusses agricultural diversification and its implications for the Philippine recovery program. The significance of diversification in monsoon Asia is that even after rice self-sufficiency is attained, agriculture still has a crucial role to play in South and Southeast Asia where the rural labor force is one-half or more of the total. Besides the direct effect on employment and nutrition, the indirect impact through public works, agri-business and off-farm employment, lower-income disparities, regional development, demand for industrial products and so on is substantial.

In the drier half year of monsoon Asia, remunerative employment is difficult to find in the rural areas, and poverty and underemployment are extensive. With irrigation in the dry months, farm families can plant diversified crops both for food and feed for animals, and the processing of these crops for sale generates off-farm jobs and additional incomes which may be as large as incomes earned in the wet months. Moreover, the additional incomes in the dry months enable farmers to buy more inputs for rice-growing during

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the wet season and to save for rice equipment. The increased purchasing power can be spent on output of urban industries and services, and this in turn will be large enough to reduce and even wipe out urban unemployment, thus enabling the whole economy to move up and grow on a full employment path.

With surplus labor disappearing and annual productivity rising, real wages begin to rise and the process of capital-labor substitution takes place, accelerating daily productivity growth, especially with substitution of machines for labor in agriculture, industry and services. The increased scale-economies of manufacturing plants permit them to penetrate foreign markets. As industry expands, farm workers especially the educated youths migrate to the cities where wages are higher and urbanization speeds up. There is then an absolute decline in farm labor force, and soon the industrial labor force begins to outnumber the agricultural labor force, completing the transition from a predominantly agricultural to an industrial economy. In this mechanism, agriculture, even after rice self-sufficiency, is still the leading sector and not manufacturing contrary to the conventional thinking. Only after crop diversification is more or less completed can manufacturing be said to comprise the leading sector, and if there is such a thing as a "take-off" it is the diversification of agriculture that is crucial in monsoon economies where underemployment is so extensive.

Being more complex than rice agriculture and requiring extensive commercialization, crop diversification stresses the need for education beyond primary schooling. This leads to fertility declines as parents perceive the need to keep their children in schools longer than primary, thereby raising the costs of bringing up children, as teenagers instead of going to work to add to family incomes continue to go to school. This is reinforced by the need of the increasingly mechanized industry and expanding commerce for educated labor. And full employment conditions open up jobs for housewives, further raising the costs of child-rearing.

The foregoing process of growth is largely based on East Asian experience. Japan was the first to go through the above process, followed by Taiwan in the latter 1960s, and South Korea in the latter 1970s. West Malaysia reached full employment in the early 1980s but the recession in the West cut short the full employment period and full employment growth was not sustained. Thailand and Indonesia were never able to multiple crop fully their agriculture and ended the 1970s with extensive rural underemployment. So did South Asian countries which in addition had large pools of urban unemployment as they invested large sums in capital-intensive

industrialization and little in agriculture.¹

Accordingly, it is good to see that the new Development Plan of the Philippines appears to emphasize agricultural development in its overall strategy. In the past, not enough attention has been paid to Philippine agriculture and even though belatedly, the focus on agriculture is very much welcomed. In the hope that further discussion may be helpful, this paper takes up certain aspects which were not taken up in the NEDA's *Medium-Term Philippine Development Program, 1987-1992*. For comparison, it presents the experience of other countries which may have useful lessons for the Philippines, besides providing a broader perspective for policies and their implementation.

In the literature, agricultural diversification is contrasted with specialization, from a one-crop economy as the most specialized to infinite-crop economy being the most diversified and least specialized. Diversification is the process of shifting from a monoculture or a few crops to a larger assortment of crops, animal, fishery, and forestry products. This concept of diversification is measured in various ways and one common method is to take the reciprocal of the sum of squared shares of the value of each crop to the total value of crops in a country, or $1/\sum_{i=1}^y (\frac{Y_i}{y})^2$ (See Appendix Table 1.) This reciprocal rises from 1.0 for one crop and will be equal to the number of crops assuming equal value for each of the crops².

It is often useful to have other concepts of diversification, such as the share of non-food grains in the total value of agricultural production. (Instead of non-food grains, non-staple foods can be substituted.) This brings out the extent of a particular type of diversification — away from food grains as a source of calories and toward nutrient, protective foods.

A closely related index is the multiple-cropping index computed as the proportion of area harvested to the physical area planted to crops. In Asia where land is limited, the main way of diversifying is to plant a second crop after rice is harvested. And where the dry season is long, the second (or third) crop can be planted only with some kind of irrigation to supplement rainfall.

¹The above section is a brief summary of my volume, *Economic Growth in Monsoon Asia: A Comparative Survey*, University of Tokyo Press, May 1987.

²For conceptual discussion, see Special Issue on "Multiple-Cropping in Asian Development," *Philippine Economic Journal*, Nos. 1 and 2, 1975. See also the discussion in Institute of Developing Economies, *Diversification and Development of Agriculture*, Proceedings of a Symposium, Tokyo 1974.

In the traditional monsoon economy when rice productivity was low, most of the drier season crops had to be root crops such as sweet potatoes, cassava, and others. With rising rice yields, especially with HYV's from Japan in East Asia, and IRRI in tropical Asia in the postwar decades, self-sufficiency was attained or approached, and the substitution of rice, the preferred grain in Asia, for other grains and root crops made possible the expansion of tastier and more nutritive crops.

Non-rice crops can be grown in both small farms and big farms. Our special interest is the diversification in small farms as we are concerned with the use of idle labor during the drier months. The larger farms, especially the estates, are concerned with perennial crops which are often cultivated with the use of machinery.

It is instructive to look at the experience of Taiwan where agricultural diversification and multiple-cropping were extensively developed by small farms. As shown in Appendix Table 1, in the early 1950s when per capita incomes were very low (about US\$100), the diversity and the multiple-cropping indexes were lowest but as rice yields rose, both indexes increased with the diversity index rising faster. The reason was that the share of rice, sweet potato and wheat in total consumption fell from 60 per cent in 1952 to 47 per cent in 1971, and this is reflected in the rise of the domestic consumption diversity index (Kuo, 1975, p. 167). The multiple-cropping index reached a peak in 1966 and began to fall, in part due to labor shortages as rural workers began to move to urban jobs, and more labor was absorbed on the more productive farms. Full employment was attained in the latter 1960s when the unemployment rate fell from 4 per cent in 1965 to 2 per cent in 1970. Unemployment in Japan fell to about 2 per cent a decade earlier in the mid-1950s which was also the peak of the multiple-cropping ratio, but diversification continued with patterns of food production and consumption similar to Taiwan's from the mid-1960s.³ In both countries, underemployment virtually disappeared.

Taiwan's diversification and hence its industrialization were widely dispersed regionally in contrast to that of Thailand's regional

³ See charts in Oshima (1983) on unemployment, agricultural and industrial employment in Japan, Taiwan, South Korea. See p. 12 of my paper in *Economic Development and Cultural Change*, Oct. 1982, on Japanese agriculture and economic growth, and *ibid.*, July 1986 for Taiwan and South Korea. Korea opted to move into heavy industrialization in the 1970s before agriculture was sufficiently developed, and unemployment rates were 5% in 1970 and 4% in 1979. In the 1980s it was forced to backtrack to agricultural development and diversification. See Oshima (1986).

specialization in the 1960s, with rice and maize in the Central region, cotton, soybeans and tobacco in the North, jute and kenaf in the Northeast and rubber and coffee in the South. The Philippines' pattern is closer to Thailand's than Taiwan's with rice in Central Luzon, tobacco in Ilocos, sugar in East Visayas, pineapple and bananas in Mindanao, and coconut in Bicol and Quezon.

As Japan and the NICs became increasingly industrialized and urbanized, there was a fall in agricultural production and its diversification. In Japan total agricultural production in constant prices began to fall from 1973, in Taiwan except for livestock and fishery its fall started from 1979, and in South Korea probably from the latter 1980s. (Agriculture in the city-states began to decline in the early 1960s.) In contrast to the West, in monsoon Asia, cultivable land is severely limited, particularly in Japan and the NICs, and diversified agriculture being labor-intensive, the long-run potentials are large for countries in ASEAN for exporting to Japan and the NICs which will comprise a market of 200 million population with per capita incomes of \$15,000 by the year 2000. This paper contends that the Philippines, situated so much closer to East Asia than Thailand, Malaysia, and Indonesia, and with so much surplus labor, idle land, and good rainfall, the long-term potentials are enormous. In the short-term, the employment created for physical infrastructure building for expanding diversification is large.

Briefly, Section 2 presents the urgent need for developing agricultural diversification in the Philippines to solve problems of growing rural underemployment (particularly in the drier months), low peasant incomes, and poor nutrition among the lower income groups. In Section 3, we look at the potentials. In Section 4 the obstacles to expanded diversification are found to be many but not insurmountable if the new Development Plan is effectively implemented. In the last section, some notes on the need for early implementation of the new Development Plan are presented.

2. The Need for Agricultural Development Via Diversification

Agricultural product grew in the Philippines by an average annual rate of 4.5 per cent compared to 5.1 per cent in Thailand and 5.5 per cent in Malaysia during the 1960s and 1970s, contributing to the slower growth of GDP of 5.7 per cent compared to more than 7 per cent for Malaysia and Thailand. The situation was no better from 1981 to 1984.⁴ The share of central government expenditures

⁴ See data in Oshima (1983), and *ADB Key Indicators*, latest issue for 1980s.

in GDP which went to the agricultural sector in 1982 was about one-half for Thailand, and one-third for Malaysia (IMF, 1983). The plans on rural and agricultural development sounded grand on paper but little attention was paid to them. The reason for the Philippines' almost tragic performance relative to Taiwan, Malaysia, Korea and Thailand was the inadequate effort to develop agriculture together with the meager results from its costly industrialization drive.

Farm family incomes must be raised substantially, if domestic purchasing power for industrial products and inputs for the rice growing in the wet season are to be enlarged. Family incomes of rural families were reported in the 1975 Integrated Census, Phase II surveys to average ₱5,736 compared with urban incomes of ₱9,122. The low level is due to the slower growth of agricultural production relative to GDP growth. In the period 1973-1983, the sector grew at 4.3 per cent per year, lower than the 6.4 per cent in industry and 5.2 per cent in services, with agriculture's share in GDP falling from 26 to 22 per cent. Agriculture's shares of total population and labor force remained high in 1983 at 44 per cent. Thus, the share of GDP relative to the share of population was 0.5 compared to 78 per cent and 56 per cent respectively of nonagriculture, or 1.4, signifying nearly a threefold difference in per capita incomes in agriculture and nonagriculture, greater than in other countries where the difference is twofold.⁵

In monsoon Asia, off-farm employment in nonagricultural work during the slack period of the drier months enables farm families to supplement farm incomes. (In Table 1 of Oshima (1985) are shown estimates of off-farm (or more properly nonagricultural) incomes earned by various countries). The lowest share of such incomes as a percentage of on-farm or agricultural (from crops, livestock, fishery, and forestry) incomes is to be found in China (8%) and the Philippines (19%). China's share has since increased to 20 per cent in 1986, as the Deng Government sought to encourage small private enterprises in the countryside, with plans to double the share by 1990. The share of Japan is highest, almost four times, and next is Taiwan, almost twice. As noted elsewhere, the high shares in Japan and Taiwan are due to the shorter dry seasons (as rains from the Pacific Ocean come during the early half of the year) and the extensive development of irrigation, both of which through the rapid growth of agri-processing generated off-farm activities. In contrast, the low share in the Philippines is due to the prolonged dry seasons in the heavily populated side of the Philippines facing the China Sea, and the poorly developed transport and irrigation systems. Without rain

⁵ Data from *World Development Report 1985*, and *FAO Production Yearbook 1983*.

during the long months and water from irrigation channels, diversified agriculture cannot furnish products to be processed in manufacturing, and services. This can be seen in Oshima (1985, Appendix Table 1) which shows that the multiple-cropping index is lower than in Taiwan and Korea, and probably Malaysia, Thailand and Java.⁶

Without much multiple-cropping and off-farm work, the farm families in the Philippines do not have enough work during slack months, and underemployment is extensive although rural unemployment may be low as the jobless migrate to the urban areas, seeking marginal, low-paying jobs in the informal sectors. Rural unemployment in the third quarter of 1985 was about 4 per cent (and urban 10 per cent), but underemployment was much larger at about 22 per cent in the first three quarters of 1985, four-fifths of whom were in agriculture. Average days worked per month of those underemployed in the fourth quarter in agriculture fell steadily from 18 to 12 days from 1977 to 1983, and for the third quarter from 17 to 12 days.⁷ In contrast, underemployment is practically nonexistent in Taiwan and Japan. Insufficient work is most difficult for the families without any farm land, too poor to migrate and without any other source of income. The landless workers have been increasing as population growth outpaced the expansion of cultivable land.⁸

Family income inequalities appear to have risen from the 1960s (1961, 1965, 1971 Household Surveys) from a Gini of 0.48 to 0.53 in 1979 (Integrated Survey of Households). The former were small sample surveys, perhaps with under-representation of the richest and poorest families. The much larger survey in the 1975 Integrated Census, Phase II, may give a better idea of the level of income disparities

⁶ For discussions on off-farm employment see *Off-Farm Employment in the Development of Rural Asia*, edited by R.T. Shand, Australian National University, 1986, Vols. 1 & 2. Also my paper in *Philippine Review of Economics and Business*, September/December 1985, for data of countries in South and Southeast Asia.

⁷ Computed from labor force surveys. Many of those working a few days per month were housewives and school children who may not be available for full time work. They may be included in the Development Plan's estimate of 30% or so of underemployment. Underemployment refers here to those wanting more work.

⁸ The 1981 Agriculture Census reveals that the number of farms increased from 2.35 to 3.44 million, 1971 to 1980, but the farm acreage rose less, from 4.49 to 9.03 million hectares and farm size fell from 3.6 to 2.6 hectares. The labor force surveys for the 2nd quarter show that wage workers in agriculture increased from 0.9 million in 1971 to 1.3 million in 1978, and 2.1 million in 1985, or about one-third of farm labor force. The 1985 third quarter survey reported 2.0 million, indicating that the wage workers were for the most part without farms to till in the busy rice planting seasons.

not necessarily indicating an upward trend. The final report gives a Gini of 0.60 which is higher than most countries in Asia. This higher figure is similar to the Gini obtained from the 1979 Family Income and Expenditure Survey. These tendencies are consonant with the falling daily wages of the Bureau of Agricultural Economics of MAF from 1973-1980. With insufficient work opportunities in the rural areas, there was a "push-out" of workers to the urban areas, contributing to the urban unemployment and to the flooding of the informal sector with excessive workers. Falling real wages of the main earners impelled housewives and children to seek jobs to keep family incomes from falling below the previous levels. This contrasts with the huge waves of farm workers who were "pulled-out" from agriculture by the expanding urban jobs in Japan during the late 1950s and 1960s and in Taiwan in the late 1960s and 1970s, and who were replaced on the farm by machines.⁹

With low rice productivity, insufficient diversification, and off-farm employment, farm family purchasing power for urban industries and services was limited. In Japan in the early 1960s and in Taiwan in the early 1970s, half of average farm family incomes came from off-farm sources, and of the on-farm incomes about one-half was from rice-growing. Thus, about three-fourths of total farm family incomes were from diversified and off-farm sources. Farm family incomes, instead of being around one-half of nonfarm family incomes in the Philippines and elsewhere, were nearly as large as nonfarm incomes in Japan and Taiwan, and grew as rapidly as time went on. The demand for urban output coming from the rural sector was considerable in Japan and Taiwan and contributed to the low urban unemployment rates. Moreover, in Asian countries, the lowest income families are found among the peasants and landless workers but this was not so in Japan and Taiwan with diversification and off-farm incomes and whose Gini index of income inequality was lowest. Hence, not only were the Japanese and Taiwanese peasants able to buy more but were able to save a great deal too.¹⁰ In the Philippines, personal savings were low, averaging only 4 per cent of GDP in the 1960s and 1970s, compared to 11.4 per cent in Thailand and Malaysia.¹¹

⁹ See charts on agricultural mechanization in Oshima (1987).

¹⁰ On Philippine income distribution, see my note in the *Journal of Philippine Development*, First Semester, 1983; on wages H. T. Oshima, E. de Borja, W. Paz, unpublished paper; on Japanese and Taiwanese farm family incomes and savings, R. T. Shand (1986).

¹¹ From official national accounts and family income and expenditure surveys.

In agricultural exports, over the postwar decades, Thailand has moved ahead of the Philippine which was in the 1950s the leader in agricultural exports. Thailand diversified quickly, exporting sugar, maize, kenaf, rubber, palm oil, and tobacco, besides rice. With low personal saving rates and slow growth of exports, the Philippines ran into chronic balance of payments (current) deficits, much larger than Thailand (Oshima, 1987, Ch. 7).

In Appendix Table 4 are shown the food supplies of various countries in the 1970s and early 1980s. The Philippines' level of calories, proteins, fats, and minerals is below those of East Asian countries and Malaysia. (The revised calorie data which are lower may show food supplies to be lower or as low as those of Thailand and Indonesia.) When compared with non-East Asian countries in the table, the 1980/1982 averages look good but these were three exceptionally good harvest years. In 1983 and 1984, rice and corn production fell to the pre-1980 levels, so that for the entire 1970s and up to 1984, the Philippine caloric and protein supplies were about the lowest in Southeast Asia.

These statistics of food supply cannot be readily compared with food requirements. Food supply and food requirement data are on per capita basis and do not say anything about the pattern of distribution among families. The distribution may be highly unfavorable to the lower income groups in countries like the Philippines where the distribution of incomes is more unequal. Moreover, it is the lower income families which need more calories than others as earnings are derived from heavy manual labor instead of light-handed, sedentary work.¹²

Moreover, food supplies are much larger than actual food intake as food is wasted in cooking and eating, and some parts are not edible. Food requirements are estimated on an intake basis by the Food and Nutrition Research Institute (around 2,100 calories), which conducted a nationwide food intake survey in 1978 and 1982. It was found in both sample surveys that calorie intake was only 1,804 and 1,806 respectively, and protein intake 53 and 50.6 grams, or 89 per cent of requirements for calories and 99 per cent for protein.¹³ The calorie difference between supplies from the food

¹² In the 1971 *Family Income and Expenditures Survey*, food expenditures ranged from 1018 pesos in the lowest income group to 1480 pesos in the higher income groups.

¹³ See *Second Nationwide Nutrition Survey*, Dec. 1983. Its survey of Luzon yielded 1,750 in 1974; and 1,650 in Visayas for 1975. By 1985 average intake was found to be 1750, according to the Philippine Development Plan, op. cit., p. 30.

balance sheets and nutrition survey (about 600 to 700) is too large to be explained away by the statement that the latter does not include food taken outside the home, which is reported to be only about 5 per cent (FIES, 1971). Rice supplies and intake match well in the two sources of data, but the differences are large for non-rice. It is precisely the figures for the diversified crops, livestock and fishery products, which may be difficult to estimate by the Ministry of Agriculture officials. The problem is a serious one for this study because it implies that the diversification data we are using may not be dependable.

Whatever may be the situation with food supplies from the production data, the important thing to consider is the food intake data from the nutrition surveys. An intake of 1750 to 1800 is far below the nutritionist's requirement of 2,100.¹⁴ Moreover, the requirement of 2100 may be too low for a fully employed economy. Nutrition surveys are usually conducted during the slack months of the monsoon when the level of economic activity is low and peasants have time to answer the interviewers. During the slack months, peasants' consumption may not appear low in terms of weight and health since they are not doing as much work as in the busy seasons. (Note that the 1978 and 1982 surveys above were taken in April and May.) If the workforce becomes fully employed throughout the year the requirement may go up to 2,300 or more, as implied by the caloric supply data for the fully employed countries of East Asia, presented in Appendix Table 4. And surely the Philippines would be shooting for a fully employed economy by the 1990s. If so, the targets indicated in the Development Plan of 1,950 calories by 1992 may be too modest and much higher levels must be aimed at. And this is true not only for rice but also for the other crops, especially because the 1982 Nutrition Survey shows that deficiencies are 10 per cent or more for calcium, iron, thiamine, riboflavin, and ascorbic acid. The importance of adequate food consumption cannot be over-emphasized. Not only is it crucial to vigorous and sustained work, its lack can cause adverse consequences as shown by the fact that malnutrition is the leading cause of morbidity. Health care can do only so much for people who do not eat sufficiently.

Finally in countries like the Philippines where agriculture was neglected and large industries emphasized, the country is unevenly developed with population and economic activity concentrated in one or few cities with tendencies toward over-urbanization unlike in Taiwan, as noted above. No better way of correcting the regional

¹⁴The Development Plan estimate is 1,750 for 1985.

imbalances can be found than through diversifying agriculture which will in turn generate agro-business besides labor-intensive industries. Fortunately, the Development Plan stresses the importance of regional development in the coming years. Fertility rates, which are highest in the poorest of the regions (Cagayan Valley, Bicol, Western and Eastern Visayas) and in Mindanao (and the highest in East and ASEAN countries) can be tackled through regional development, (including the extension of educational opportunities).

3. The Philippine Potentials for Agricultural Diversification

In the table below are shown diversity indexes for the Philippines and other countries.

Table 1. Diversity Indexes

Year	Agri. Diversity Indexes ¹		Crop Diversity Indexes			
	Philippines	Thailand	23 crops		7 leading crops	
			Philippines	Taiwan ²	Philippines	Taiwan
1960				4.01		4.01
1970	8.39	6.64	6.55	6.67	6.67	6.80
1975	8.03	6.14	7.19		7.38	
1980	7.55	6.47	7.20		7.38	
1981				5.33		5.44
1984	8.51	6.89	7.21		7.42	

¹Agricultural diversity indexes include livestock, fishery, forestry products and 6 leading crops.

²Crop diversity indexes exclude non-crop products in the agricultural diversity index, although Taiwan's figures for 1960 and 1970 include livestock.

Sources: Official *Philippine Statistical Yearbook 1985*, *Thailand National Income*, and *Taiwan Multiple-Cropping in Asian Development* for S. Kuo's paper in *Philippine Economic Journal*, *op. cit.* and *Taiwan Agricultural Yearbook* for various years.

Philippine levels of diversification are not low, being higher than in Thailand and Taiwan at the latter's height of diversification in 1970. It is indicative of a favorable historical background and natural endowments for diversification, and testimony to the fact that the Philippines in the past was diversified while importing large amounts of rice, and consuming corn as a second staple. Nevertheless in the recent decades, the Philippine crop diversity index has not changed much, as based on a simple measure of diversification, namely, the

share of non-rice production in total agricultural production.¹⁵ That there may be potentials for further diversification for the Philippines with good rainfall, rich lands, poor nutritional status, and large markets in nearby East Asia can be seen in the steady drop of the share of agricultural value added (leaving out the traditional export crops of sugar, coconut, banana, and abaca and also excluding rice) in GDP from 19 per cent in 1970 to 16 per cent in 1984. As to the share of rice in the agricultural value added, it is 16 per cent for the Philippines compared to 22 for Thailand. However, since corn is also a staple food crop in many parts of the Philippines, the inclusion of corn brings the Philippine share close to that of Thailand.

More than most other Asian countries, e.g., Thailand and Taiwan, the Philippine countryside is diverse — in terms of rainfall (there is year-round rainfall in Mindanao, while heavy rains occur in the summer and fall months in Luzon, and also in the fall and winter months in the Visayas), in soil characteristics, in topography, and in temperature. This tends to favor crop diversification, though complicating its implementation.

Taking into account rainfall patterns, soil texture, slope and elevation, L. A. Gonzales has found that 10.6 million hectares out of 30 million were suitable for a variety of cropping patterns, of which the three major diversified crops for import-substitution, corn, soybeans, and cotton were suited to 3.7 million hectares.¹⁶ He found private profitability (private net profit as per cent of gross revenues) high for the import-substitution crops (corn, cotton, and soybeans). For other exportable crops (mungbeans, cassava), the private profit rate was lower but positive. For livestock, it was high for goats, carabaos and cattle and lower for hogs, broilers, and layers.

From a social point of view, based on domestic resource cost analysis and social profitability measures, Gonzales found that under conditions of foreign exchange constraints, "a strong economic argument of efficiency exists in the domestic production of current imported commodities (cotton, corn, and soybeans), and potential export crops (rice, white potato, cassava, sorghum, garlic and pea-

¹⁵We have put on the chart the share of diversified products in total agricultural production for several countries and found that for the Philippines, India, and Indonesia it has been falling since the 1950s and rising for Japan, Taiwan, South Korea and Thailand.

¹⁶See Gonzales (1984). The most important, corn, was found to be suited to 1.5 million hectares. Further studies are underway as part of ADB-funded studies on diversification.

nuts)".¹⁷ Elsewhere, Gonzales also found that, except for broilers there was comparative advantage in Philippine livestock production. Even for broilers, the improvement in domestic corn production could result in comparative advantage.

These results were obtained even though only one per cent of diversified crops was grown with irrigation, despite much potentially irrigable areas in the Philippines (58%). With rice self-sufficiency, investment funds for irrigation construction can be shifted to more water and drainage for diversified crops. Moreover, as rice yields per hectare continue to rise in the future, some of the existing irrigated rice lands can be shifted to the production of diversified crops.¹⁸

The foregoing studies show that suitable land and water are potentially available for diversification, and the financial and economic prospects appear to be promising. As noted in the previous section, labor is plentiful for the drier months and throughout the year. But how much of this idle labor will be needed in the construction of irrigation/drainage works and in the cultivation for diversified crops? In the appendix, the estimation of employment generated by crop diversification is attempted with readily available data. Briefly stated, in 1985, 1,920 million mandays of work was generated in the agricultural sector, of which only 212 million mandays or 11 per cent was spent on rice cultivation. The rest was spent on other crops, livestock, fishery, forestry, and in various processing, transporting and other services ancillary to agricultural production. (The discussion of details is postponed to the last section of this paper.) As the Development Plan suggests, further research on land classification, land capability, and domestic resource cost is needed, together with the expansion and upgrading of research and extension for a long-term diversification program. There may be a need to raise the Development Plan targets for some of the diversified crops, especially those which may be exported to Japan and the NICs. Although highly protected, barriers for these crops show signs of being lowered in East Asia.¹⁹

¹⁷ See Gonzales (1984, p. 9). These measures, as in other quantitative indices, do not take into account qualitative aspects. But in the long run the quality of Philippine products can be improved, particularly under conditions of better institutional mechanisms, so that foreign exchange saved from import-substitution and earned from exports can rise.

¹⁸ Irrigation design for rice growing is not ideal for diversified crops, and studies are underway, using different furrow and sprinkle systems.

¹⁹ According to Elisa T. Caoyonan, NEDA head of the Trade section, the Japanese trade liberalization is not helpful to ASEAN since the majority of the products imported are from the U.S. and EEC.

4. Obstacles to Overcome in Facilitating Diversification

Obstacles to the expansion of diversification may be divided into those relating to physical endowments and to man-made institutional arrangements. In the Philippines, fortunately the former is less important than elsewhere.

Rainfall is sufficient in the Philippines, averaging higher than in Thailand, 84 inches to 47. The Thais do not get enough rainfall in some parts for year-round irrigation, although irrigation constructed from 1973 to 1982 has been growing more rapidly in Thailand than in the Philippines, 4.2 per cent per year as against 3.8 per cent. Irrigated area as a percent of arable land in 1982 is lowest in the Philippines among countries in ASEAN and East Asia.²⁰ A large public works program for irrigation, perhaps doubling the irrigated area may be needed. Of 4,365,000 hectares planted to temporary crops, only 6 per cent benefited from irrigation in the dry season (*Philippine Statistical Yearbook*, 1985).

In a country with 7,000 islands, uneven terrain and varied agriculture, transporting of goods requires both marine and land facilities, i.e., harbors, ships, roads, and railways. The agricultural marketing reports of the Bureau of Agricultural Economics, Ministry of Agriculture and Food, covering a large number of provinces almost invariably complain not only of high transfer costs but of inefficiencies resulting in delays, wastes, and spoilage. This is a problem of insufficient and inadequate farm-to-market roads, harbors, storage, and market communication facilities. In Taiwan, in the 1960s when the diversification policy was pursued, paved rural roads had to be tripled, the number of trucks and RR wagons increased eight times, and cold storage capacity doubled (Chen, 1975).

In 1975, length of roads and railways per 1,000 rural population was higher in the Philippines (4.2 kilometers) compared to 3.4 for Malaysia and 1.0 for Thailand. Similarly, shipping tonnage was much higher than in Thailand and Malaysia, in large part because of the much larger coastal areas. The problem in the Philippines is the inadequately built and maintained roads. In 1981, one-third of Philippine roads was unpaved compared to one-sixth in Thailand, and this is particularly true with the farm-to-market roads which become impassable during the rains. Good transportation is vital not only for buying inputs for diversified crops and marketing them but also for the travel of farm families to the towns for off-farm jobs.²¹

²⁰ See *FAO Production Yearbook* and Appendix Table 3.

²¹ Data from the *Statistical Yearbook of Asia and the Pacific*, ESCAP and *Philippine Statistical Yearbook*, 1985.

But with so much underemployed labor in the rural areas, there are plenty of hands during the dry season to be hired to build the small-scale irrigation and drainage works and the farm-to-market roads both of which are less demanding of skills and equipment than major works and roads. These physical infrastructural problems are constraints which can be solved in time and should be done at once while surplus labor, many of whom are experienced construction workers, is available.²² As Professor Raul Fabella of the UP Economics Faculty suggests, one natural obstacle that cannot be eliminated is the frequency of typhoons in the Philippine area. There is no denying the great damages caused by typhoons to crops but the typhoon season usually coincides with the rainy season of the monsoon when the winds come from the Pacific and not during the dry months during which the diversified crops are grown. Hence, a diversified agriculture is better suited for the typhoon areas which can recoup the damages of the wet season.²³

The institutional constraints may take longer time to remove as is usually the case with most major developmental problems. While the institutions were being improved by neighboring countries during the past decades, those in the Philippines may have been considerably deteriorating.

Agricultural administration was fragmented at the national level into 17 major agencies (such as agrarian reform, natural resources, coconut authority, tobacco authority, etc.) linked through their own local branches to the provincial, municipal, and to barangay levels. Top-level decisions which were sent down from these agencies to the farmers in the villages were often confusing and sometimes conflicting. Most of these agencies had their own extension services and loan funds and some of them organized separate farmer's association at the village level (Serrano, 1985). To rationalize this medley of institutions into an efficient delivery system may take several years and may not be in time for the recovery program, unless forthright action is taken.

There are more difficult problems on the receiving end. Despite the rhetoric of land reform, tenancy has been increasing from

²²It may be added that rural electrification is necessary for village processing of some of the diversified crops and in livestock, aquaculture, and forestry production, although here, too, the Philippines with U.S. assistance has been making good progress. Construction workers are jobless because of the end of the construction boom of the 1970s.

²³Only about 10% out of an annual average of 20 typhoons in the past decade came in the first half of the year. See *Philippine Statistical Yearbook, 1985*.

865,000 tenant farms in 1960 to 872,000 in 1980, and from 2,000,000 hectares to 2,412,000 hectares. This makes agriculture in the Philippine one of the most tenanted in Asia with tenant farms comprising 26 per cent of total farms, and 25 per cent of total lands. In contrast, the respective figures in Malaysia (1977) were 10 per cent and 4 per cent, in Thailand (1978) 6 per cent and 5 percent, and in Taiwan (1980) 7 per cent and 13 per cent.²⁴ The constraints that high tenancy entail for diversification are several: the resistance from landlords to multi-cropping for diversification for fear of lowering land fertility; the increased rent which must be paid by tenants for the use of the land, effectively reducing ability to buy inputs for diversified crops; the lower motivation to work; the impairment of human dignity and social equality in the villages; and the blunting of initiatives, innovativeness, and self-development.²⁵

High tenancy hampers the organization of independent farmers' association, and weakens the organizations of existing institutions. The extensive development of independent cooperatives in Japan and associations in Taiwan came about after the extensive land reform in the early postwar period. These were the organizations which coordinated at the receiving end the varied inputs and services which came from national government, besides managing the buying of farm inputs and the collection, transport and selling of outputs. The Philippine's *Samahang Nasyon* with a membership comprising only one-fourth of the number of farmers has a long way to go before they become effective agents of the farming population.

Unlike the cooperatives in Taiwan and Japan, the *Samahang Nasyon* and others are too weak to handle credit which was poorly carried out by the rural banks nearly all of whom are reported to be bankrupt with uncollectible loans. A large part of their loan was borrowed by landowners with the small farmers forced to depend on friends and moneylenders charging usurious rates.

In the Philippines, powerful groups of trader-truckers exercise extensive controls over the marketing of most fruits and vegetables, both in the financing and sale of inputs and in the purchase of outputs. These groups sell the products to central markets which are

²⁴ Data are from respective agricultural censuses, and exclude, for all countries, part-owners. See Appendix Table 2 on landholdings in Asia.

²⁵ In Japan before the land reform, landlords prevented second and third cropping because they felt that land fertility declined. See Ogura (1966), and Shen (1964) for the impact of land reform on agricultural development. In Taiwan, before land was distributed, share tenancy was converted to leasehold with rents much lower than shares. This brought down prices of land and made the landlords willing to sell their lands.

under the local governments who charge rents and various fees.

The balance of power is heavily against the peasants and the consumers, unlike in other countries like Thailand where the freer and more independent Thai peasants can produce to meet consumer needs. In the export of diversified crops, the Thais have performed far better than the Philippines.

The constraints on the demand side are found domestically in the low purchasing power and in protection and restrictions in foreign markets. With so many workers jobless, and real wages low due to declines over the past, it is said that many families can eat only one or two meals per day. Tariff and non-tariff restrictions on diversified crops have been rising in the nearby markets of Japan, Taiwan and South Korea as the costs of production rise rapidly, with rising wages reducing their comparative advantage in food production. Since their peasant farms are small, typically one hectare, mechanization takes the form of small-scale mechanization. Tariff rates in Japan range from 20 to 30 per cent, besides various non-tariff protection such as import quotas, quality standards, inspection, and so on. It is reported that the Ministry of Agriculture is aiming at increased self-sufficiency in the future for many foods.²⁶ And these protective measures are rising not only in Japan but also in Taiwan and South Korea. Nevertheless, Thailand has been able to penetrate these markets better than the Philippines.

Finally, a constraint to productivity is the deterioration of education. A former Minister of Education found that a substantial portion of primary school graduates were illiterate. As soon as public funds become available, daily hours of school attendance should be raised from 4 to 6 or 7 and teacher wages and training should be improved. In Japan, Taiwan and South Korea, schoolchildren spend double the number of hours per year in school than in the Philippines not only because of longer daily hours but because of a 6-day week and much shorter vacation periods. To be efficient, diversified crop production and marketing will require educated farmers, preferably with education beyond primary (Lockwood *et al.*, 1980). And for agri-business, and other rural industries, six years of secondary education will be desirable. The present system of four years of secondary schooling is only found in countries whose per capita in-

²⁶ See G.R. Tecson, "Export Markets for Philippine Diversified Agriculture and Labor-Intensive Industries," paper presented at the Seminar in Economic Development in the Philippines, School of Economics, UP Diliman, Dec. 1985. Tecson points out that tariff rates on food products in Western Europe are even higher (about 40%). They are, however, low for Hong Kong and Singapore which have no large agricultural sector to protect.

come is much lower than the Philippines, i.e., Nepal, Bangladesh, and China, all countries in the beginning of the agro-industrial transition and not midway as the Philippines. Nor is it possible to improve the quality of tertiary education with youngsters who enter college with only ten years of schooling, since courses in the first two years of college must be watered down to make up for the deficiencies in secondary education, and the courses in the last two years to take into account the lower quality of the first two years. With the availability of more funds, education should get top priority for reconstruction.

The Development Plan's call for character education in primary and secondary grades is most welcomed. This should not be confined to matters such as cleanliness, neatness, respect for elders, honesty, and the like but strong emphasis on work education would be desirable. Modern technology requires diligence, dedication, responsibility, initiative, innovativeness, and cooperative behavior in the workplace; a good culture of work can be taught in the schools, with the help of the homes and mass media.²⁷

5. Diversification and Beyond

A comprehensive strategy with detailed implementing procedures may be possible very soon, with the completion of major studies financed by ADB on irrigation design for non-rice crops (presently worked on by the International Irrigation Management Institute), of regional diversification strategy and policies by IFPRI and their employment implications by ILO, and the completion of land capability mapping and the zonification of cropping patterns by the Bureau of Soils of the MAF. The comprehensive mapping of crops must include the international marketing potentials for the short and long run, taking into account possibilities of changes in protection in East Asia and elsewhere, and competition to be encountered in these markets from neighboring countries, particularly Thailand, China and Indonesia.

But even before such a comprehensive plan is drawn up, a diversification program should be started soon with priority given to the

²⁷ For detailed discussion see Oshima (1980, 1986). A recent study by the International Food Policy Research Institute financed by the Asian Development Bank, entitled *Price and Investment Policies for Food Crop Sector Growth in the Philippines*, Washington, D.C. 1987, takes up in detail price, irrigation and technology issues. It recommends that prices for rice and corn be stabilized moderately above world prices (about 20%) in the short term while efforts are made to improve productivity through large increases in irrigation and R & D investments to bring down prices in the longer term.

most distressed regions of the country. These are the regions where production of corn, soybeans, or cotton might be given priority in meeting the domestic demand from import-substitution policies. They are the regions also where food consumption levels are low so that their increased demand for rice, roots crops, and other basic dietary needs from additional employment will be the greatest. Besides the import-substitution crops, these areas could grow crops such as white potato, cassava, sorghum, garlic, onions, peanuts, mungbeans and mango for exports. One redeeming feature of these poorer areas is the more even distribution of rainfall during the year compared to other regions such as Ilocos, Central Luzon, and Southern Tagalog, as they are located closer to the Pacific Ocean than the China Sea. Potentially irrigable areas, except in Western and Eastern Visayas, are substantially greater, about 65 percent compared to 40 percent (see Appendix Table 5).

For Western Visayas, particularly in the sugarlands where idleness has become most severe, a World Bank team has suggested substituting for sugar, the planting of corn, peanut, soybeans, coconut, rubber, cocoa and ipil-ipil trees, besides fruits such as mango, banana, and pineapple on a modest scale.²⁸ Other crops may be sweet potato, mungbean, cassava, sorghum and rice for local consumption.

Another priority area is Bicol which has the lowest per capita income, the highest inequalities, and one of the largest pool of underemployed workers, but whose water supply is so abundant that it causes flooding. There is not enough multiple-cropping of rice lands in provinces like Sorsogon, which with irrigation can use second crops of rice, cassava, corn, sweet potato, sorghum, besides various perennials and fruits inter-cropped on coconut fields. Similar crops are needed for Central and Eastern Visayas where per capita incomes are low and idleness extensive.

Another region where surplus labor is plentiful is Cagayan Valley in the north. With irrigation, the region can grow more rice, corn, soybean, tobacco, peanut, mungbean, sorghum, cassava, and a number of vegetables (onions, squash, tomato, eggplant, sweet pepper).

In Mindanao, except for Western Mindanao, surplus labor is plentiful, and with rainfall all year round, second rice crops, diver-

²⁸ *Philippines: Sugarlands Diversification Study*, IBRD, March 1986. The information in this section comes from Gonzales (1984), *Land Resources Evaluation Studies for Crop Zonification Project*. Bureau of Soils, MAF, (no time reference but perhaps early 1986) and various marketing reports of Bureau of Agricultural Economics, MAF.

sified crops such as corn, soybeans, sorghum, rootcrops, and fruits such as banana and pineapple should create more employment. The potentials for diversification in Mindanao go beyond these crops into many others such as cacao, palm oil, coffee, rubber, cashew, various legumes and vegetables, aquaculture, livestock, and forestry crops most of which require processing and marketing.²⁹

As noted in the previous section, the main difficulties will be in the mounting of the institutional mechanism to put into operation the diversification program even for selected areas in the southern regions. Implementation of policies has been a shortcoming in the experience of this country even for much less formidable projects than diversification which must deal with millions of small peasants in diverse and scattered settings. It is arguably one of the most difficult programs to be effectively put into operation in developing nations. It is difficult to specify the institutional models for land reform, for constructing physical infrastructure, for the selection of cropping patterns, for the delivery of technology, credit, and inputs, and the marketing of outputs, and particularly so for a country where institution-building has not been one of its strong points.

Nevertheless, some experience has been gained over the years in the various approaches to rural development, an example of which is provided by the International Institute of Rural Reconstruction at Cavite. Its philosophy was the basis of a rural development program launched by the Magsaysay Administration in the late 1950s. Many of the models tried out were supported by foreign governments such as Japan's agriculture productivity program in Cagayan Valley and Bohol, Australian projects in Eastern Visayas, Zamboanga and Antique, in Cebu by the Germans, and the integrated agricultural production and marketing project of the USAID. One project, going beyond the pilot state, reached 40 municipalities. This was the Rainfed Agricultural Development Project (popularly known as Kabsaka project) which was able to introduce two and three croppings in the rainfed areas in the uplands. Others were the Farming Systems Development Project in Leyte and Samar and the Integrated Estate Development Project, which attempted to develop groups of farmers benefitting from land reform into agribusiness units.³⁰

²⁹ With more rice from Mindanao and other southern regions, it may be that that the northern regions could shift from their second crop of rice to nonrice in their multiple-cropped farms.

³⁰ This section is largely based on Segundo Serrano's *Farming Systems Development: The Philippine Experience*, Bureau of Agricultural Economics, MAF (undated).

An integrated approach has evolved out of these projects whereby a package of technologies and cropping patterns is introduced by researchers and extension agents who work closely with small farmers through their organizations to improve output and productivity, in part by removing obstacles to the access to land through agrarian reform, to the obtaining of credit, and to the delivery of fertilizer, water and other inputs. These and other projects could be expanded into programs and modified in various ways to meet the needs of diversification. The management of these programs could be improved by the rationalization and consolidation of various agencies on the national, regional, and provincial levels. It could perhaps benefit from the Taiwanese experience with an organization like the JCRR (Joint US-China Rural Reconstruction) and Malaysia's rural development authorities. I recall that in carrying out the comprehensive land reform in Japan and Taiwan, a commission was appointed in each village with representation from landlords, landowning farmers, tenants, and government officials to carry out the land-to-the-tiller program.

In Table 2 below, we attempt a "ball park" estimate of how much employment will be generated by a program of diversified development in the Philippines. Assuming that non-rice agricultural production is increased 10 per cent over that of 1985, we get 280 million mandays of employment generated. Our estimated unemployment is 328 million mandays in the table. Employment

Table 2

1. Estimating employment generated by diversification: 1985

Assuming a 10 per-cent increase in non-rice production;

In million mandays (of 8-hour workday)

170 in non-rice agriculture

100 in agro-processing and agro-servicing industries

10 in public works construction

280 Total

2. Estimating unemployment

In million mandays (of 8-hour workday)

168 needed by the fully unemployed workers

160 needed by the underemployed

328 Total

See Appendix note for sources and methods of estimation.

generated is short by 48 million mandays. Probably this can be made up by taking into account mandays of work for private construction of agro-industries, and also the greater intensification of cultivation due to farmers receiving land in the land reform program. But no account has been taken of the new workers entering the labor market (less those moving out and going overseas). This amounts to about 2 per cent.

Because of the importance of underemployment it is better to use mandays rather than employment as in the Development Plan. The magnitude of public works based on 1985 estimates has been increased many times in the new Development Plan so that total employment generated may come up to the 328 million mandays of unemployment. But unemployment also has risen substantially from 1985.

On the other hand, we have not taken into account the employment generated by the multiplier process, that is, the increase in jobs due to the spending of income generated by the 10 per cent increase in diversification. We have estimated that ₱305 billion of incomes originate in agriculture and related industries (see Appendix note). If we take 10 per cent of this as the increment, and deduct 30 per cent or ₱9 billion as leakages abroad, the multiplicand is ₱21 billion which, multiplied by 5, will total ₱105 billion. Assuming ₱105 per manday, one gets one billion mandays created through the multiplier process as a consequence of a 10 per cent rise in diversified agriculture, or about three million annual employment. The increased demand for labor from the multiplier effect can easily absorb the surplus labor in the urban areas, as well as whatever unemployment remains in the rural sector.

In the foregoing, we are assuming that the increase in agricultural production is not due to the weather, or better seeds, better technique, etc. and that all other conditions of production are normal, so that the increase in the demand for labor due to the increase in production will follow the normal situation. In this case, the underlying reasons for the enhanced demand for labor with increased diversification will be its greater labor-intensity, greater agro-processing intensity, and the need for more supporting services and physical infrastructure than in rice agriculture. But a 10 per cent growth of diversified agriculture has not been realized in Asian post-war experience, even in the case of Thailand and Malaysia with so much new lands brought into cultivation. But 5 per cent growth per year is not impossible and has been experienced in Malaysia and Thailand; perhaps the Philippines should target 4 per cent for three years to reach full employment.

In sum, an agriculture-based strategy is not to condemn the Philippines forever to a nation of "hewers of wood and drawers of water." Rather it is a necessary step to a sound and sustained industrialization process which nearly all countries of the advanced world and the NICs (except for the city-states) had to go through. The agro-industrial transition cannot be completed expeditiously without strong emphasis on agricultural development in the first half of the passage, something which both India, China and others have learned after their failure to leap-frog with heavy industrialization in the early postwar decades into advanced industrial economies.

And this is especially the case for all countries with monsoon agriculture. The labor-intensity of monsoon paddy agriculture had piled up over the centuries an enormous population which have insufficient work during the drier half-year and must become fully employed with multiple and diversified agriculture and off-farm employment before its purchasing power for nonagricultural products can expand enough to start and sustain the process of industrialization.³¹ With full employment, real wages rise and the process of capital-labor substitution accelerates on farms and firms, and migration to urban areas expands. Soon the size of the labor force in industry begins to exceed the agricultural labor force, completing the transition from an agricultural to an industrial economy.

All through the postwar decades, the Philippines "missed the boat" as Hong Kong and Japan began the above process from the early 1950s and Taiwan and South Korea in the 1960s, and Thailand and Malaysia in the 1970s. These countries have moved too far ahead for the Philippines to catch up in the next decade. Fortunately, one more opportunity is opening up and the Philippines should not miss this one. The value of the Japanese yen has zoomed up to levels so high (and may go up even further) that a vast regional restructuring of the economy becomes inevitable. The NICs are the first beneficiaries of the high yen but very soon they will face labor shortages and rising wages, and when this occurs Japan must turn to the other Asian countries. Labor-intensive industries first from Japan and then from the NICs will be relocating to the lower-wage ASEAN countries. The Philippines, which is so close to Japan and most of the NICs and has a large English-speaking workforce is in a good position to benefit from the high yen. But Japanese firms are now making

³¹The demand for the products of diversified agriculture can come not only from abroad and internally from rising incomes but from substituting for imports of corn, soybeans and other feed for animals, animal products, various fruits and vegetables and raw materials whose imports run into several hundred million pesos each year.

plans to relocate elsewhere, as the Philippines delays the liberalization of trade and investment policies.

Philippine agricultural diversification can benefit immensely from the opening up of markets in Japan, Taiwan and South Korea. These countries are protecting excessively their agricultural sector. But with labor shortages, rising wages, and high food costs looming ahead, the chances for liberalizing food imports in East Asian markets may improve. For this to take place soon, a concerted effort must be made by the Philippines, Thailand, Malaysia, Indonesia and other countries to remove the barriers in East Asia. It is equally important to improve the quality and productivity of diversified agriculture in the Philippines as soon as possible to be ready to penetrate East Asian markets when they open up. The urgency for the speedy and vigorous implementation of the new Development Plan is particularly great as not only the other countries are moving quickly to take advantage of the strong yen but also because of the awakening of giant China to the unfolding opportunities in East Asia.

If all goes well with the implementation of trade and investment liberalization and diversification in the first half of the Six-year Development Plan, the tightening of the labor market should see the rise in real wages and the increase in purchasing power. In the second half of the Plan, with the continuation of the diversification program, capital-labor substitution will begin and labor productivity will rise in farms and firms. The urban demand for labor will pull out workers from the farms and migration will begin to reduce the agricultural labor force. The Philippines will then be on the road to sustained industrialization with full employment. If the first half must emphasize the reconstruction of the economy from the ravages of the past, the second half should begin the efforts to improve institutions which are most crucial for the sustained growth of the economy into the next century. To map out plans for these and other changes, it will be convenient to begin as soon as possible, and to work out long-range plans toward the year 2000 with the assistance of a number of expert committees, as Japan, Taiwan and South Korea did. Medium-term plans cover too short a period to grapple with and work out deep-rooted problems which are often the most intractable impediments to rapid and sustained growth.³²

Economic growth, as Kuznets has emphasized, is a long-range

³² See *Japan in the Year 2000*, Economic Planning Agency, Tokyo: 1981; *Long-Range Plans for 1986-2000*, Economic Planning Council Taipei: 1986; *Korea in the Year 2000*, volumes on different aspects by various agencies, Seoul: 1985. In the introduction to the Japan plan, Saburo Okita points out that the

phenomenon spanning decades, since institutional changes which involve changes in social values take much time. The improvements in institutions were extensive in Japan and the NICs, not only in climbing to full employment growth level but in sustaining it. In this, Japan and the NICs were fortunate to find growing markets in the West which developed vigorously into the early years of the 1970s. No longer can this exuberance be expected for the coming years, although the strong yen may eventually turn out to be helpful for ASEAN countries, as noted.

The problem that a long-range plan may have to contend with is how to maintain high growth after full employment is reached, and pump-priming tapers off and then comes to a stop. As the economy moves into the 1990s, a major objective must be the improvement in the operation of institutions. With wages rising after full employment, if the contribution of labor productivity to total factor productivity does not rise, if the increase in profits are invested abroad or consumed in imported luxury items, if rising teachers salaries do not improve education and if import-substitution industries continue to charge high prices for shoddy products, and above all, if the performance of government agencies fails to improve — the chances are that the economy may fall back to past trends, attaining a growth of aggregate GDP of only 4 to 5 per cent instead of the 8 to 9 per cent average of the NICs and ASEAN. How the bureaucracy, schools, local governments, police system, public utilities, agrarian and industrial relationships, entrepreneurship and management, and so on are to be improved must be worked out by experts both in the public and private sectors. (In constructing the Japanese Year 2000 Plans, 128 experts met 182 times and a dozen volume or so were published for wide circulation.)

It is difficult to sustain growth at high levels for long periods, even for developing countries which can depend on the import of new technologies. For, the changes in institution (whose interaction with technological changes underlie modern economic growth), must occur at a rapid pace. One way to speed up institutional change is to work out careful plans and allow for sufficient time for their imple-

purpose is "to grasp the general direction of changes society is expected to undergo and to take necessary measures to cope with such changes as soon as possible." Thus, it is a map for the next two decades "essential for trekking the mountains." In Japan's first long-range plan from 1960 to 1980, the object was to catch up with Western technology. See also forthcoming volume by the Asia Pacific Development Council on the papers of the 1986 Beijing Conference on *Asia in the Year 2000*, Kuala Lumpur, 1987.

mentation.³³ It is hoped that this paper will open up a discussion on the need to complement the medium-term with a long-range one, not so much to predict the future but to identify the major problems that need to be tackled to reach goals that the Philippines can hope to attain in the light of probable constraints imposed by future external conditions.

ADDENDUM

(1) Since the above was written, the results from the labor force surveys in 1986 and the first three quarters of 1987 have become available. They indicate that unemployment and underemployment have persisted at levels as high as those in 1985 (NCSO special release, 1987). Unemployment in the Philippines has been higher than in the ASEAN countries long before 1985.³⁴ Consequently, many of the lower-income groups have sunk deeper into poverty, and even for those with jobs, real wages have dropped so low over the years that they are not sufficient for the lower-income groups to purchase adequate amount of foods and other basic necessities (*Manila Chronicle*, November 9, 1987, p. 11.) To maintain subsistence levels, more and more in the working age groups are compelled to enter the labor market, raising the labor force participation of teen-agers and housewives. Moreover, the political instability in the Philippines is attracting Japanese firms to other ASEAN countries.

(2) Under the circumstances, additional steps may have to be taken. For one thing, agrarian reform, with comprehensive land distribution, is urgently needed. Japanese, Taiwanese and Korean experience indicates that land reform implemented with credit, irrigation, roads, and so on can induce the new owners to put in more labor per hectare, increasing yields per hectare and farm income. Labor input per hectare on Philippine rice lands is about the lowest in Asia. IRRI compilation shows that in the early 1970s, the Philippines' 80 mandays per hectare was lower than 92 mandays in Thailand, about 120 mandays in S. Korea and Taiwan (with mechanization), 170 in Sri Lanka, 210 in Malaysia, and 360 mandays in Java which was the highest (Palacpac, 1980).

³³It took Japan much of the Tokugawa period to shift family loyalties to national concerns, while children in Japan and South Korea go through 10 years or so of moral education in school with stress on work ethics. The NICS went through the modernization of institutions and values for decades before World War II. Details are found in Oshima (1982, 1986, 1987).

³⁴See data presented by Dr. Edna Reyes of PIDS at the APDC meetings in late October 1987.

(3) Labor input per hectare rose in Japan after land reform by about 20 per cent in rice and 10 to 30 per cent for other crops, averaging about 15 per cent for all crops with the increase in the smallest farms, much more than in the larger ones. In addition, more labor was absorbed by multiple-cropping which rose from 1.4 to 1.6 crops per year per hectare by the mid-1950s. Before land reform, landlords opposed multiple-cropping as the fertility of the soil was reduced, and tradition dictated that landlords could not get a share from non-rice crops. Together with off-farm employment in the processing of diversified crops, the agricultural labor force became fully employed by the turn of the decade into the 1960s.

(4) In Taiwan, after land reform the number engaged in agriculture rose from 1.5 to 1.9 million by 1968 with virtually no expansion in farm land area. This increase was due to the rise in multiple-cropping which went up from 1.7 to 1.9, and to more plowing, fertilizing, spraying, weeding and so on. Together with greater diversification and off-farm work as in Japan, Taiwan farmers became fully employed by the end of the 1960s. Export of farm commodities rose, and the proceeds were used to finance machines for industrialization.

(5) In South Korea, labor used per hectare rose each year at 2.7 per cent (male-equivalent) right after the land reform in 1952-1954, 4.7 per cent, 1954-1960 and 1.3 per cent, 1960 to 1965, for a total increase of nearly 9 per cent. In the 1970s, Korea's strategy switched too much into heavy industrialization but reverted to the promotion of agricultural development toward the late 1970s and into the 1980s with increased spending on rural public works, extension services, agricultural education, marketing services, and so on. Diversification accelerated.

(6) More effort needs to be devoted to skill-formation, not only in academic directions but in vocational training programs. Japan began early in the postwar decade to emphasize vocational education, while Korea and Taiwan followed suit in the mid-1960s. Public vocational training programs in the Philippines have been minimal even today. With labor-intensive industries becoming technologically more complex, vocational skill-training should not be neglected for the 1990s.

(7) About 45 per cent of the joblessness is in the age group less than 25 years old. This calls for programs targetted to the young,

unmarried workers. Perhaps something like the Civilian Conservation of New Deal days in the U.S. may be suitable. The youth will be put on rural infrastructure projects with skill-training aspects included. Or food-for-work programs for other young people may also be needed. Trainors for these may be asked from the U.S., Japan, and other industrialized countries with a large pool of retired, experienced technicians. Some countries in Asia have been trying out self-employment projects with training in skills and entrepreneurship.

(8) In sum, the Philippines needs to go all-out in employment generation. Otherwise, the solution of other major problems such as law and order and political instability may be difficult to solve. And without political stability it will not be able to attract investments from abroad, particularly from Japan and soon from the NICs. An opportunity of a lifetime is opening up with the events unfolding in the aftermath of the stock market crash of June 1987. The problems confronting the U.S. economy are forcing Japan and the NICs to turn increasingly to ASEAN and the Asian Pacific community for their future growth. To strengthen the ASEAN economies, Japan will be recycling a large part of its huge trade surpluses and domestic savings to ASEAN countries and Japanese companies are looking for places to move into. But many are skipping the politically unstable Philippines even though it has a well-educated labor force and is located closer to East Asia than the others.

Appendix Note: Estimating Mandays in Various Agricultural and Related Activities

We use mandays, defined to be eight hours of work per day in the NCSO's labor force surveys and in the Ministry of Agriculture's labor utilization surveys, since data on manhours are not available. Total aggregate mandays worked by the labor force in agriculture is equal to mandays in agricultural activities, including livestock, fishery, forestry, besides farming. We also estimate very roughly mandays in related activities, agro-industries and public works. A third component is the employment/income multiplier.

A. Aggregate Mandays in Agriculture

1985 Labor Force surveys divide the labor force into rural and urban; the agriculture and nonagriculture breakdown was not available at the time this was written. For both rural and urban, during the second and third quarters, using the data on number of days worked by employed workers, we get 2,041 million mandays. Days worked for the first and fourth quarters in 1985 were not available

but the first and second quarters are slack periods and the third and fourth are busy periods since the monsoon rains come in the second half of the year. Thus, total employed in the second and third quarters averaged 4,400 million compared to 4,200 or 5 per cent less. If we deduct 5 per cent from the 2041 for the second and third quarters, we get 2029, or for the entire year, a total of 4070 million mandays for the entire labor force, rural and urban.

Using the mandays worked for the rural sector only, we get 1,230 and 1,170, or 2,400 million mandays worked in the rural sector, leaving 1670 for the urban sector. The rural sector is larger than the agricultural sector; for the Philippines the definition of urban is extremely broad, generally including towns with 2,000 persons and more. Hence in the 1975 Integrated Census, 13 per cent of total agricultural production was in the urban sector while 33 per cent of nonagricultural production was in the rural sector. We therefore, deduct 20 per cent from 2,400 million mandays to get 1,920 million mandays for agriculture.

Aggregate mandays in rice production is estimated by multiplying 3.2 million hectares of harvested rice in 1985 (from the Bureau of Agricultural Economics or BAEcon) by average mandays, 65.8 (from the BAEcon's labor utilization surveys of selected provinces),* or *212 million mandays* for rice, about 11 per cent of total agricultural mandays. In 1983 and 1984 the national accounts show that gross value added in rice production was 15 per cent of the total in agriculture indicating that rice was produced with less labor-intensity than the rest of agriculture. The rest of the mandays comprising 89 per cent of the total is allocated as follows.

All other crops: from the data sources mentioned above, we compute aggregate mandays to be 686 million or 36 per cent of the total relating to 5.2 million hectares. This gives average mandays of 132, which is double the labor-intensity of rice production. The higher labor-intensity is not due to the major commercial crops, banana, sugarcane, coconut, and pineapple whose average mandays come up to about that of rice but due to vegetables, the most labor-intensive being garlic (201 days), onions (337 days), and string-beans (131 days). The reason for this may be due to the need to tend vegetable crops throughout the season whereas in the case of paddy (and most perennials), labor required is minimal after the planting and until harvesting.

*These are data collected during 1982-1984 in various surveys covering each of about 30 crops and for 2 or 3 provinces where the crops were found to be important. They are about the best data presently available for the Philippines.

Livestock, Fishery, and Forestry: The data on mandays are on a per farm basis for livestock and for fishery and there are no mandays data on forestry. It is difficult to obtain data for the number of farms appropriate for the mandays data. The 1980 Agricultural Census data include farms with only one or two carabaos or a few chickens. The number of such farms is too large. The 1975 Census' totals for farms mainly in livestock and fishery are too small (804,000 and 222,000 respectively). Until more information becomes available, there is little to work on, and we simply take the proportion of total wages in gross value added in the three sectors and divide the remaining aggregate mandays (1022 million) to obtain 481 million in livestock, 406 million in fishery and 135 million in forestry. These figures tend to be on the high side and probably include days worked around the farm in processing, transporting, selling of various products, and in operating and maintaining irrigation and other physical infrastructure -- all of which are included in the labor force concept of work in agriculture.

B. Aggregate Mandays in Related Activities

Related activities cover agro-processing manufactures which purchase the output of farms, industries selling inputs to farms, and marketing services, transporting, storing, financing and selling. Also included is public construction of irrigation, drainage, roads, and piers needed for the agricultural activities in A above. These industries in B may be thought of as activities linked backward and forward as in input-output tables, often the source of off-farm jobs for farm families. Their expansion due to increases in A activities may be regarded as the acceleration effect, while C below is the multiplier effect.

The latest publication of the *Annual Survey of Establishments, 1979* reports food, beverage, tobacco, wood and paper manufactures to employ 380,000 workers and generate P10 billion of added value, both amounting to about one-third of total manufacturing employment. Preliminary announcements of the 1981 survey indicate similar shares of employment and income.

From the 1974 *Inter-industry Accounts of the Philippines*, the main manufactures selling to agriculture are the chemical, petroleum, cement, metal product and machinery industries, accounting for P2 billion sales, or 12 per cent of income originating in manufacturing in 1974. Non-manufacturing industries selling to agriculture are the public utilities, construction, financial institutions, transport, communication, storage, government, and retail and wholesale trade, totalling P1 billion, or 3 per cent of income originating in these sectors.

Mandays and income are very roughly approximated by apply-

ing the percentage shares above to 1984 income and employment originating in the respective industries. Net value added in manufacturing in 1984 was ₱128 billion, and in other industries and services ₱143 billion (from national currents minus 10 per cent for depreciation), for a total of ₱271 billion. If we add one-third or 33 per cent for manufacturing firms buying from agriculture and 15 per cent for industries selling, 48 per cent or roughly one-half of ₱271 comes up to ₱130 billion. We estimated in A above that of a total of 4070 million mandays, 1920 million were used in agriculture, leaving 2150 million for nonagriculture. Multiplying by 48 per cent, we get a total of 1,032 million mandays for industries.

For public works (roads, ports, irrigation, flood control), the data available do not lend themselves for estimation of public works needed for agriculture. On the basis of infrastructure projects programmed for 1986 by the Ministry of Public Works, NEDA has estimated that around 20 million mandays will be required. But this includes public works for urban needs besides schools, national buildings and the like. We arbitrarily take one-half of 26 million or 10 million mandays for our purpose, and one-eighth or ₱5 billion total cost of the infrastructure program as income originating.

Thus, total mandays in B are 1042 million and income originating, ₱130 billion.

The totals for A and B are ₱305 billion for incomes and 2962 million mandays which come to 100 pesos per manday. This is on the high side when compared with NEDA's use of 57 pesos per day for construction workers. But the 88 pesos is more than wages, as it includes proprietors' income, property incomes, and corporate income.

C. Aggregate Mandays from the Multiplier Effect

Incomes and employment generated by increased activities in A and B above comprise multiplicands in the usual multiplier mechanism. The average propensity to consume in 1984 is about 92 per cent of national income, if we use national accounts data. This has been steadily rising in the past few years from 84 per cent in 1981, as real per capita incomes have fallen, so that the marginal propensity may be rising. We use a multiplier of 5, taking into account leakages from the multiplicand. Similar results can be obtained simply by multiplying by 5 the mandays generated by the 10 per cent increase in diversified agriculture and deducting 30 per cent leakage, or 280 million mandays minus 80 million mandays, or one billion mandays.

Appendix Table 1 — Taiwan: Diversity and Multiple Cropping Indexes

Average: Years	Diversity Indexes of			Multiple Cropping Index	Per Capita Incomes 1976 prices	Per Capita Caloric Supplies	Rice Yields
	118 Products	7 Products	Domestic Consumption				
1952-1954	3.51	3.52	4.60	172.7	169.7	2179	2183 (1)
1955-1957	4.09	4.11	5.30	175.2	157.3	2293	2261
1958-1960	4.52	4.54	5.68	181.6	142.0	2363	2440
1961-1963	4.29	4.32	5.48	185.3	153.0	2357	2684
1964-1965	5.71	5.76	6.06	188.7	196.0	2388	2988
1966-1968	5.85	5.91	6.43	188.5	251.0	2494	3091
1969-1971	6.80	6.92	8.05	182.1	363.3	2658	3065
1972-1974				176.9	658.7	2757	3186
1975-1977				175.1	1036.3	2766	3337
1978-1980				162.2	1748.0	2826	3447
1981-1983	5.33 (2)	5.44 (2)		155.3 (2)	2386.3	2733	3560 (2)

Notes: (1) 1954 only, (2) 1981 only

Sources: Diversity and cropping indexes from W. Kuo, *Philippine Economic Journal*, Nos. 1 and 2, 1975, pp. 150-168, up to 1971; thereafter estimated from data from *Taiwan Agricultural Yearbook* and *Statistical Yearbook* which are also the sources of other data in the table. Diversity index is the reciprocal of the sum of squared shares of the value of each crop to the total of crops in a country.

Appendix Table 2 — Per Cent Distribution of Agricultural Households (HH)
by Size of Holdings

Size of holdings in ha.	Taiwan (1980)		Burma (1980/1981)		Thailand (1978)	
	HH	Holdings	HH	Holdings	HH	Holdings
under 0.5	44.35	12.54	61.10	24.80	1.60	0.06
0.5 — 2.0	53.12	71.04			41.73	13.97
2.0 — 4.0	1.99	8.44	24.54	31.16	21.76	17.52
4.0 — 8.0	0.45	3.39	11.66	29.00	24.50	34.83
8.0 — 12.0	0.05	0.89			6.25	15.19
12.0 — 20.0	0.04	3.70	2.64	12.76	3.72	14.76
20.0 & over			0.06	2.28	0.46	3.67
Size of holdings in ha.	Japan (1980)		Korea (1980)			
	HH	Holdings	HH	Holdings		
under 0.5	42.33	12.72	29.68	9.43		
0.5 — 1.0	28.72	25.87	34.69	27.80		
1.0 — 1.5	14.36	21.55	20.35	26.97		
1.5 — 2.0	7.22	15.18	8.84	16.45		
2.0 — 3.0	5.28	15.87	4.99	12.80		
3.0 & over	2.09	8.81	1.45	6.55		

Appendix Table 2 (Continued)

Size of holdings in ha.	Philippines (1980)		Indonesia (1983)	
	HH	Holdings	HH	Holdings
under	0.50	0.71	44.52	10.49
0.50 - 0.99	14.20	3.09	23.42	15.77
1.00 - 1.99	28.19	12.24	18.62	24.26
2.00 - 2.99	17.95	13.70	7.09	16.07
3.00 - 4.99	17.20	21.25	4.08	14.73
5.00 - 7.00	8.29	16.58	1.78	11.29
7.01 - 9.99	2.23	6.49		
10.00 - 24.99	3.03	14.46	0.49	7.39
25.00 & over	0.43	11.49		

Sources: Report on 1980 Agricultural and Fishery Censuses, Taiwan-Fukien District, Republic of China, Summary Report, Taipei: 1982; Report to the Pyithu Hluttaw on the Financial, Economic and Social Conditions of the Socialist Republic of the Union of Burma, Rangoon: 1984; 1978 Agricultural Census Report, Thailand, Bangkok: 1980; Yearbook of Agriculture and Forestry Statistics, Republic of Korea, Seoul: 1982; 1983 Agricultural Census of Indonesia, Jogjakarta: 1985; 1980 Census of Agriculture, Philippines, vol. 1, National Summary, Manila: 1986; and Japan Statistical Yearbook, Tokyo: 1983.

Notes: For Taiwan, Burma, Thailand and Japan (excluding Hokkaido) the size shares were estimated from mid-points of intervals except for the highest bracket where 1,500 hectares was taken. For the other countries actual means could be computed.

The share of total land held by the highest bracket in the Philippines is 11.5 per cent compared to less than 3 per cent in Thailand, Burma and Indonesia, and less than 1 per cent for Japan, Taiwan and S. Korea where comprehensive land reform was undertaken. Unfortunately, the 1980 agricultural census did not publish the holding size of those with more than 25 hectares. But S. Reutlinger and his associates at the World Bank in Agricultural Development in Relation to the Employment Problem, Staff Working Paper No. 112, Washington, D.C.: 1971 show that the Philippines is the only country in Asia in the 1960s with a significant number of farms over 50 hectares, comprising about 12 per cent of the total area. The 1971 Agricultural Census shows 13 per

	Farm land per worker (1000 ha) 1982	Average Rainfall (in.)		% of irrigation to arable land		% of permanent land to arable land (1982)		
		12 months	Wet Dry	1969-71	1974-76			
East Asia								
Taiwan		77.6	59.2	18.2	50.9	54.2	75.7*	
Japan	0.8	67.0	43.9	23.1	68.1	73.5	75.9	13
South Korea	0.4	78.2	57.9	20.3	46.2	51.4	57.1	6
China	0.4	36.6	25.3	11.2	41.4	43.5	45.9	3
Southeast Asia								
Malaysia	1.9	88.8	48.8	40.0	26.4	32.8	38.2	325
Thailand	1.2	47.3	41.3	6.0	16.0	16.2	19.5	11
Philippines	1.5	84.1	62.3	21.8	11.6	15.3	17.6	51
Indonesia	0.7	94.0	78.8	15.2	33.7	34.0	38.2	37
South Asia								
India	1.0	78.4	69.9	8.5	18.8	20.5	24.5	2
Sri Lanka	0.8	67.3	37.3	30.0	48.7	50.2	49.3	107
Burma	1.4	88.8	80.8	8.0	8.5	10.3	10.8	5
Bangladesh	0.3	96.0	83.4	12.6	11.9	15.2	20.2	2
Nepal	0.4	50.6	47.4	3.2	6.0	7.9	9.9	1

Sources: Farm land per worker and per cent of irrigation and permanent land to arable land are from *FAO Production Yearbook 1980 and 1983*, pp. 50-52, 57, 65-66. Average rainfall are from the *Statistical Yearbook* for each country. Irrigation per

Appendix Table 4 — Per Capita Caloric and Nutrient Supplies

	CALORIES			PROTEINS			FAT			MINERALS*		
	1969	1974	1980	1969	1974	1980	1969	1974	1980	1969	1974	1980
Japan	2758	2789	2869	82.5	84.9	90.8	59.7	69.5	82.6	536.3	556.2	592.0
Taiwan	2658	2758	2763		75.0 ^b	77.5						
South Korea	2456	2610	2938	64.5	73.4	82.1	23.0	29.1	40.5	344.0	410.0	482.3
Singapore	2682	2801	2937	68.9	75.3	76.0	52.0	62.1	72.8	506.7	568.7	532.3
Hong Kong	2690	2685	2768	76.7	78.6	82.0	98.6	101.5	112.2	405.6	421.0	450.9
Malaysia	2417	2500	2636	49.9	54.5	61.5	46.6	49.8	55.3	291.2	296.4	344.6
Philippines	2026	2116	2405	48.1	50.4	54.3	31.1	31.1	32.3	243.3	247.1	293.3
Thailand	2160	2211	2312	46.8	45.8	46.4	25.9	24.7	27.0	251.8	246.8	272.1
Indonesia	1872	2048	2363	38.5	42.1	50.5	25.3	30.0	34.0	215.7	236.8	265.6
Sri Lanka	2308	2040	2331	46.0	41.2	44.5	51.7	46.1	57.6	296.3	261.0	307.1

Notes: *calcium plus iron in milligrams; 1975 only.

Sources: From *FAO Production Yearbook 1984* except for Taiwan which came from *Statistical Yearbook of Taiwan and Indicators* for various years.

Appendix Table 5 — Income Distribution, Unemployment, and Irrigable Area in Philippines, by Region

Region	1 9 7 5		1985 (3 quarters)			Per cent of Potential Irrigable Area (1982)		
	Per capita Income (1000)	GINI		Un Employment	Under Employment		Visible underemployment rate	
		Both	Urban					Rural
Philippines	1.13	.607	.597	.601	7.1	22.9	17.4	57.7
Region I	0.94	.585	.573	.584	4.2	18.6	12.7	39.6
Region II	1.04	.582	.600	.579	5.2	23.9	18.4	63.7
Region III	1.03	.571	.555	.575	7.2	19.7	14.8	43.3
Region IV	1.09	.591	.578	.587	6.7	22.8	17.7	50.5
Region V	0.86	.638	.600	.644	3.4	27.9	23.4	56.3
Region VI	1.12	.584	.616	.568	5.8	33.1	28.6	48.3
Region VII	0.99	.640	.657	.614	3.3	11.6	8.8	65.6
Region VIII	0.99	.588	.566	.591	5.8	25.7	20.4	36.4
Region IX	1.05	.629	.572	.642	6.5	16.6	12.5	57.1
Region X	0.99	.625	.599	.643	5.5	24.0	17.3	79.2
Region XI	1.18	.604	.538	.635	6.0	29.0	21.8	69.5
Region XII	1.08	.535	.518	.538	2.8	29.4	23.1	76.8

Sources: Per capita income and Gini from 1975 Integrated Census of the Population and its Economic Activities, Phase II, NEDA/NCSSO, Dec. 1984. Unemployment and underemployment from NCSSO Special Release No. 568, Jan. 1986, (average of 3 quarters). Visible underemployment is that part of underemployed population wanting more work. Per cent of potential irrigable area from Philippine Agricultural Diversification: A Regional Economic Comparative Advantage Analysis by L. A. Gonzales, May 1984, p. 99.

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