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LEVELS AND TRENDS OF FARM FAMILIES' NONAGRICULTURAL INCOMES AT DIFFERENT STAGES OF MONSOON DEVELOPMENT

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This paper brings together available data and studies on off-farm activities in Japan, Taiwan, South Korea and other Asian countries and examines the forces underlying the levels and trends of nonagricultural incomes. *Nonagricultural activities* is defined here as all activities in the industrial and service sectors. The focus of the analysis is that of farm families and their annual incomes.

The paper presents estimates of the shares of nonagricultural incomes of farm families for Asian countries for which data are available. It also describes the growth of nonagricultural shares and their composition as the economy moves from one stage to another in various stages of development, mainly the first or agro-industrial transition, and it discusses the impact of nonagricultural employment on the distribution of family incomes, population growth and policy prescriptions.

The Problem and its Significance

About a decade and half ago, we reported that "the population explosion of the 1950s and 1960s will be converted into a labor force explosion in the 1970s and the 1980s" and probably into the 1990s, with workforce growth doubling from an average of 1.25 per cent per year in the 1940s and 1950s to 2.5 per cent in the 1970s and 1980s (Oshima 1971). Recent World Bank estimates show that the growth will be above 2.5 per cent in the ASEAN countries (excluding Singapore) and somewhat less in South Asia *(World Development Report 1984).* The sustained agricultural development efforts of the ASEAN countries from the latter 1960s and the 1970s have kept open unemployment at a minimal level, except in the Philippines. Sporadic efforts have left vast pools of unemployment in most parts of South Asia.

It was thought a few years back that industrial development in the 1980s such as achieved by the NICs in the 1960s and 1970s will absorb the expanding workforce. However, with the slowdown in

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the industrialized countries, the prospects of industrial absorption no longer appear promising. Others hoped that intensification of rice-growing can solve the problem, citing the fact that rice farms in Japan and Taiwan before mechanization were using labor per hectare about three times more than in most countries of tropical Asia. But this view did not take into account the fact that rice farms were almost entirely irrigated in Japan and Taiwan, substantially more than in tropical Asia where rainfed paddies required much less labor. Moreover, rice lands, especially rainfed, were more plentiful in most of tropical Asia so that rice self-sufficiency (with the help of HYVs) was being reached long before there was need for the extensive and costly irrigation that Japan and Taiwan had to construct to reach self-sufficiency in rice. Finally, absorbing more labor in intensified rice farming in the wet season was not a sufficient solution as it left a larger workforce looking for work in the dry season of monsoon Asia.

These dilemmas compelled economists in Asia to look in other directions for labor absorption. In the past few years, about half a dozen conferences have been held to examine nonagricultural activities in the rural areas seeing that off-farm incomes and employment were considerable in Japan and Taiwan. In one of them, I reported on findings from Japan, Taiwan and South Korea (with the most extensive, time-series data on off-farm activities), showing substantial increases in the levels and shares of off-farm incomes as these countries moved through the various stages of development, contrary to the conclusion of the Hymer-Resnick model.[1] In this paper, the available data and studies of other countries in Asia are brought together with those of Japan, Taiwan and South Korea, and forces underlying the levels and trends are examined.

Historical Significance of Nonagricultural Activities in Monsoon Agriculture

In the West, after the decline of feudalism and the manorial economy, came the revolution in agriculture, and in England large-scale, capitalistic estates emerged, which paved the way for the industrial revolution. The unity of manorial agriculture and industry

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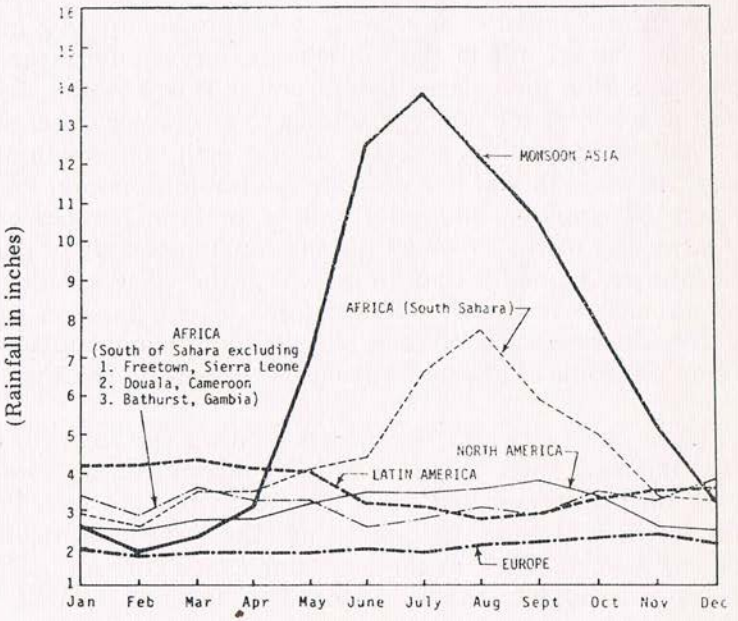
[1] "The Significance of Off-Farm Employment and Incomes in Post-War East Asian Growth." Asian Development Bank Staff Paper No. 21, Jan. 1984; see in particular, Charts 1,2,3,7,8,9. Off-farm incomes were found to be more important than farm incomes in keeping total farm family incomes and savings abreast of nonfarm family incomes in the postwar growth of Japan and Taiwan.

was dissolved and agriculture became specialized into a combination of farming and animal husbandry. The separation of rice farming from industry was not possible in Asian rice farming as land was barely enough to grow crops to feed work animals only. The integration of the two prevails everywhere today, even in Japan and Taiwan where rice growing is most advanced. Japan, right after the Meiji Restoration, attempted to bring in Western agriculture but after a decade of experimentation gave up and went back to small size family farming. Mao established large-scale, communal farming but without much success, and today the family has been brought back into the forefront with off-farm activities spreading.

Underlying the prevalence of small-scale rice farming in monsoon Asia was the pattern of heavy rainfall in one-half of the year and dry weather in the other half, compared to the relatively even rainfall in the West and elsewhere. (See Chart 1). As described in detail elsewhere, the heavy rainfall led to a type of staple-food production which was the most labor-intensive known, requiring much time for transplanting and harvesting with tiny reapers.[2] This in turn produced population densities unparalleled in staple-food farming in



Source: Royal Meteorological Office, U.K.
See Appendix Table 1

Chart 1. Rainfall Patterns for the Major Regions of the World

[2] For details, see Oshima (1985).

the world, with China able to support a population much larger than all of Europe on arable land far less by the 18th century. But this huge workforce found little to do remuneratively when the rains went away. Traditionally, Asians turned to various types of craftwork, fishing, forestry, construction of irrigation, and so on during the dry months. But with machine-made cloth and other manufactures replacing peasant production in the urban markets, with limited fishing grounds, small boats and primitive gear, prohibitive costs of irrigation construction, and with insufficient land to grow animal feeds, these sources were unable to supply enough incomes to supplement the meager returns from tiny farms and Asia stagnated in poverty as the West pushed ahead in the second half of this millenium. As long as rice farms were tiny, and dry weather lasted for long months, nonagricultural activities were much more essential for the sustained growth of monsoon economies than in the West with extensive land and animal husbandry.

Concepts and Framework

Following Hymer and Resnick, it has been customary to think of nonagricultural activities as relating to the production of *Z* goods, i.e. activities carried out in the households, service and artisan establishments *within* the village (or rural areas). This, however, unduly restricts the scope of the concept, leading to misleading conclusions, such as that nonagricultural activities decline with the growth of the economy. As we shall see, in a growing monsoon economy, there is an upsurge of employment opportunities for farm families in the nearby cities and towns to which peasants commute daily or seasonally for jobs paying better than those within the villages. Moreover, a focus on such a restrictive concept leads to emphasis on substitution effects between *Z* goods and idleness and urban manufactures, which may not come to grips with essential elements in the analysis.[3]

In place of *Z* activities, we have been using the term *off-farm activities*. But this raises the issue whether marine fishing, forestry, and work on plantations and other farm activities are included in off-farm activities. It may be best to use the term *nonagricultural activities of farm families*, as the least ambiguous concept, defining agriculture as cropping, animal husbandry, fishing, hunting, and

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[3] *American Economic Review*, Sept. 1969, p. 493. They put heavy emphasis on substitution, pushing aside the forced idleness due to the dry weather by citing brush fallowing which however important in Africa south of the Sahara is of minor mportance in monsoon Asia where not many peasant Asian families have the choice of constructing or not constructing irrigation works.

forestry, following the widely used International Standard Industrial Classification (ISIC) of the United Nations. Nonagricultural activities will then comprise all activities in the industrial (mining, manufacturing, construction, public utilities, transportation and communication) and service (commercial, personal and public) sectors.

Nonagricultural activities of farm families (inclusive of landless farm families and those employed on estates) exclude nonfarm families in the rural areas, contrary to another widely used concept, *rural nonfarm activities.* The difficulty with the latter is that the definition of rurality varies widely from country to country, all the way from localities with a population of 2,000 in countries like the Philippines and 20,000 for Taiwan while many countries do not provide any rural-urban cut-offs in terms of size (Sri Lanka, Indonesia, Thailand, Burma, Singapore, etc.). Since most of the jobs for villagers are in the nearby small cities and towns, it is crucial that rural and urban be uniformly defined so that rural nonfarm families can be standardized for cross-country, and overtime comparisons. Otherwise, inclusion of families of public officials, teachers, professionals, merchants, handicraftsmen, construction and transport workers, and so on in the smaller cities and town will be larger for countries with broad definitions of rurality and smaller for countries with narrow definitions. It is best to dispense with rural-urban distinction, and confine the discussion to farm families, which are taken to be synonymous with agricultural families (in the ISIC sense). Although the definition of farm families is not without ambiguities, the variations across countries appear to be much less.[4]

Analytically, the focus of our main interest is that of farm or agricultural families and their annual incomes. It is their low incomes in monsoon settings that has held back Asia historically, as noted, and the transition from agriculture to industry is not possible without their substantial and sustained rise. As discussed elsewhere, to attain satisfactory growth in monsoon Asia, annual farm family incomes in the transition must grow not only with rising yields per hectare, but with multiple-cropping and diversified agriculture, and with nonagricultural activities if the passage through the transition is to be rapid.[5] And it is better to measure nonagricultural activities of farm families by income rather than employment which is a blunt measure for most purposes.

Statistically, the data are more plentiful for nonagricultural incomes of farm families than for employment in the various sta-

[4] See *FAO Production Yearbook.*

[5] See Oshima (1984 and 1985).

tistical sources such as family income and expenditure surveys. The estimates from these surveys can be supplemented and checked from another source, namely, income or product originating in agriculture in the national accounts and compared with *total* farm family incomes to arrive at nonagricultural incomes of farm families, a procedure that cannot apply to rural nonfarm activity and *Z* concepts. Nor are these concepts useful in the comparison with Western industrialized countries where villages are disappearing from the rural scene.

To break off long stretches of historical time spans into stages, we have been experimenting with the use of transition phasing similar to the demographic transition. These transitions are presented here as a frame to keep track of and describe the passage of the economy through the first transition from a predominantly agricultural to an industrial economy, and the second transition from a predominantly industrial to a service economy, (with each sector defined as in the ISIC, noted above). The first is completed when the industrial labor force begins to exceed the agricultural, and the second when the service labor force exceeds the industrial. The first transition—our main concern in this paper—is divided into the early stage which starts with roughly 3/4 of the workforce in agriculture, the middle stage with 2/4, and the late stage with 1/4 of the labor force toward the completion. These are somewhat arbitrary, but if used approximately and without too much concern for the numbers, they are useful, and are intended to give a framework that will be more specific than the phasing presently used. They should be kept separate from a theory of full employment growth purporting to explain postwar growth in monsoon Asia where variables in the framework were linked to one another to comprise a model, as discussed elsewhere.[6]

Typically, at the beginning of the first transition, agriculture is dominated by carbohydrate production, not only of rice but also cassava, potatoes, barley and other inferior grains. The predominance is due to the low efficiency of agriculture in which a large part of

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[6] See Oshima (1984). Japan completed the service transition by 1980, Taiwan moving into the latter, and South Korea in the earlier stages of the service transition. West Malaysia was at the late stage of the industrial transition in 1980, with Philippines and Thailand in the middle, but Nepal, Bangladesh, Burma, Vietnam, India and China were still in varying portions of the early stage with Indonesia approaching the middle stage. It took Japan, Taiwan and South Korea about half a century to complete the first transition for a number of reasons. It is the first transition that is difficult and time-consuming to traverse. Its successful completion makes the second transition easy, and quickly completed as the experience of Japan, Taiwan and Singapore shows.

the population does not have sufficient food. In countries such as Nepal and Bangladesh, at the very beginning of the transition, the share of food expenditures rises with increasing family incomes in the cross-section of income and expenditure surveys for the lower half of the deciles.[7] With the rise in yields per hectare, there is a shift from root crops and inferior grains to rice, and with further rises around the middle stages, to vegetables, fruits and animal products. These changes from one stage to another can be expressed as a matter of choice with prices playing a role as in the Hymer/Resnick theory but the critical, underlying realities of low efficiency and dire poverty are missed.

The Statistics of Nonagricultural Incomes of Farm Families

In Table 1 are assembled estimates of the share of nonagricultural incomes of farm families for as many countries in Asia as data are available. These shares are sufficiently comparable for a rough comparison of levels across countries and of overtime trends in each country. In the footnote to the table are estimates for the U.S. from 1936 to 1974 and for Ireland and Yugoslavia. It would have been desirable to compute for a much larger number of Western countries including those of Latin America and Africa if their households surveys were available in Southeast Asian libraries. If these figures for the three countries turn out to be representative for Western countries, they indicate that despite the higher per capita incomes in more advanced stages of development, the share is low, less than one, compared to Taiwan in 1980 or Japan in 1970.[8]

The data are better for Japan, Taiwan and South Korea than for the other countries. The farm household surveys are conducted annually in the East Asian countries, largely on a record-keeping basis with a track record extending over several decades. As the footnotes to Table 1 point out, the agricultural income data from the Japan and Taiwan surveys come fairly close to the estimates of in-

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[7] See official household income and expenditure surveys cited in Table 1. For India, too, there is a rising portion of the Engel coefficient in one-third of the households. Elsewhere I have designated the point up to where the Engel coefficient begins to fall as the dire poverty point for countries in the early stage. This rising portion disappears for countries in the middle stage when family incomes are arrayed in deciles.

[8] One other figure may be noted, that of 22% for small farms and 6% for large farms in Zambia in 1966-1968, cited by Anderson and Leiserson (1980).

Table 1 — Nonagricultural Incomes of Average Farm Families in Asian Countries, Postwar

Country	Years	A Agri. Income per Family	B Nonagri. Income per Family	B/A in %
East Asia				
China (in RBM)	1978	130	3.44	2.6
	1979	154	5.81	3.8
	1980	182	9.11	5.0
	1981	207	16.50	8.0
South Korea (in 1000 won)	1970	195	33	16.9
	1975	700	97	13.9
	1980	1700	550	32.4
Taiwan (in 1000 NT$)	1970	17	14	82.4
	1975	40	36	90.0
	1980	58	108	186.2
Japan (in 1000 yen)	1950	145	41	28.3
	1960	225	165	73.3
	1970	510	850	166.7
	1981	968	3805	393.0
Southeast Asia				
Philippines	1965	3046	357	11.7
	1971	3790	776	20.5
	1975	2522	488	19.3
Malaysia (million M$)	1973	233	36	15.5
	1979	424	166	39.2
Thailand	1971	10000	6000	60.0
	1978/79	11049	6758	61.2
South Asia				
Bangladesh	1963/64	720	156	21.7
	1973/74	812	229	28.2
	1976/77	672	144	21.4
Sri Lanka (monthly income)	1963	149	55	36.9
	1978/79	470	184	39.2
Nepal	1977	3588	1981	35.6

come originating in the official national accounts. There are some variations in the income concepts from country to country, those of the Philippines and China representing a narrower one excluding transfer receipts and property incomes in nonagricultural incomes. Most of the estimates exclude imputed rent of owner-occupied houses but they all include imputed value of home-consumed food.

With the exception of the Philippines in 1975 and Bangladesh in 1976/77, the absolute values and shares of nonagricultural incomes are rising over time in each country. This is also true for the U.S., as noted in the footnote to Table 1 where the share doubles from the prewar years to the early 1970s. The Philippine survey for 1975 is not comparable with the 1965 and 1971 surveys as the former comprised a huge sample with nearly 400,000 households compared to about 20,000 in the earlier surveys. The larger sample covered greater varieties of communities such as very rich districts and poor ones in remote areas. But because of the extensiveness of the coverage, the time spent by interviewers for each sampled households was briefer, and incomes were understated as insufficient questioning

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Sources:

China: *Statistical Yearbook of China*, 1981. Philippines: *1965 and 1971 Family Income and Expenditure Surveys* and *1975 Population Census, Phase* II, Special Release for 74 provinces, various dates. South Korea: *Report on the Results of Farm Household Economy*, various issues. Taiwan: *Family Income and Expenditure Surveys*, various issues. Japan: *Farm Household Economy Survey*, various issues. Bangladesh: S. R. Osman and A. Rahman, *A Study of Income Distribution in Bangladesh*, 1981. Sri Lanka: *Report on the Sample Survey of Consumer Finance*, Part I, Colombo, 1964. Nepal: *A Survey of Employment, Income Distribution and Construction Patterns in Nepal*, 1977, Planning Commission, Kathmandu, 1983. Malaysia: Communication from Department of Statistics, 1983. Thailand: *IBRD Growth and Employment in Rural Thailand*. Washington, D.C. 1980; 1971 data estimated roughly from percentage increases cited in the IBRD study.

For Japan and Taiwan, agricultural incomes of farm families from the above surveys have been compared with income originating in agriculture from the national accounts (for 1981 for Japan and 1980 for Taiwan on a per capita basis) and they are roughly similar, being about 5% higher in the survey for Japan and about 10% lower in the national accounts.

In the U.S. data are available from its *Statistical Abstract* and from the *Historical Statistics of the U.S.*, Department of Commerce, Part I. Personal income from nonfarm sources averaged 46% in 1936 to 1945, 53% in 1951 to 1960, 77% in 1961 to 1970, and 97% in 1970 to 1974.

With the sources available it was possible to work out average per capita income on farm households for Ireland (1973) and Yugoslavia (1976) from the ILO compilation of household surveys, *Household Income and Expenditure Statistics*, 1968-1976, No. 3, Geneva: 1979. The share of nonagricultural incomes of farm households as percentage of per capita income from the national accounts turned out to be 55% for Ireland and 81% for Yugoslavia.

made for omissions. Hence, the decline in average household incomes for both agricultural and nonagricultural as shown in Table 1. The figures for Bangladesh are low for 1976/77 because of poor harvest, about 10 per cent lower than in the previous year. The figures for nonagricultural incomes for all years understate the contribution by women whose production is overlooked even more than other Moslem countries where women's place tends to be confined to the house. But Moslem women do a great deal of work in the house other than the customary home chores, as various studies have reported.

Despite these coveats, the cross-section results do not show close association between size of the shares and development stages, even though the shares tend to be highest for Japan and Taiwan and lower for China and Bangladesh. Nepal with the lowest per capita incomes and the highest share of the workforce in agriculture has higher shares than China, Philippines, South Korea and Sri Lanka. South Korea has lower shares than Thailand, Malaysia and Sri Lanka. A loose positive relationship can be detected but not too much can be made out of it. In the next section, forces other than development stages are noted in the cross-section results, followed by a discussion on the forces underlying the differential pace of the upward trend in the shares of the countries.

Forces Underlying Differences in the Levels and Trends of Nonagricultural Incomes

As in all cross-section results, a variety of factors intervenes to blur the relationship between stages (or per capita incomes) and shares. The major ones may be grouped as follows: the amount of labor farm families can supply to the nonagricultural labor market is mainly determined by the length of the dry season minus how much of the dry season is spent on farm work on their own farms and those of others and for livestock, fishery and forestry. The difference of the two approximately comprises the amount of labor supplied to the nonagricultural labor market. As noted below, the factors determining the length of the dry season and type of agricultural activities during the dry months vary from country to country.

The monsoon rainfall pattern varies among countries, as can be seen from Charts 2 and 3 which disaggregate the average in Chart 1. Three major patterns may be singled out: the first, as in Bangladesh, Burma, India and Java, shows a pronounced peak, higher than the average pattern in Chart 1. In the second pattern as in Thailand,

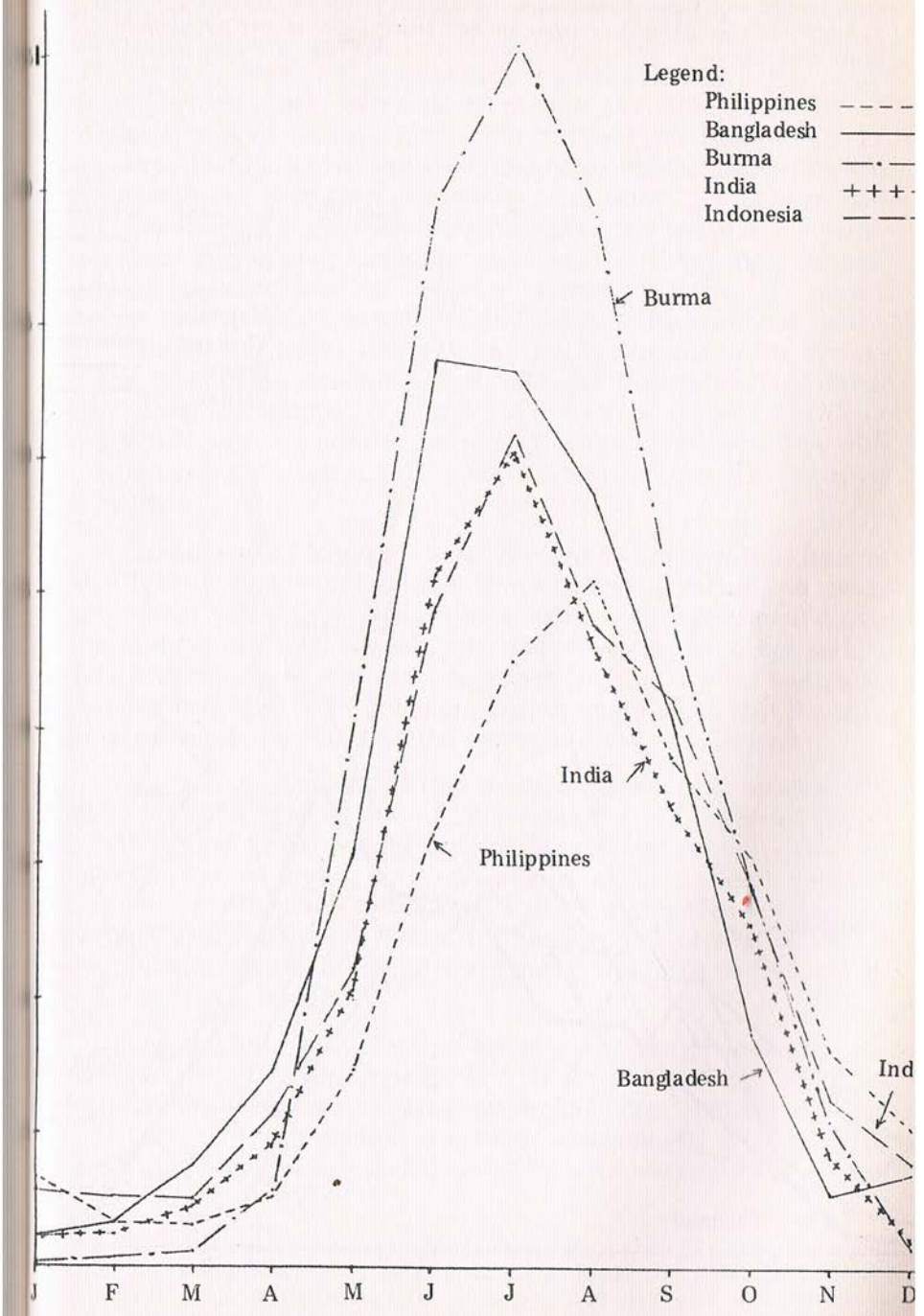

Chart 2 — Countries with High Peaks of Rainfall

Data in this and Chart 2 are from the official statistical yearbook of each country and the national averages are computed from heavily populated regions circa 1970s.

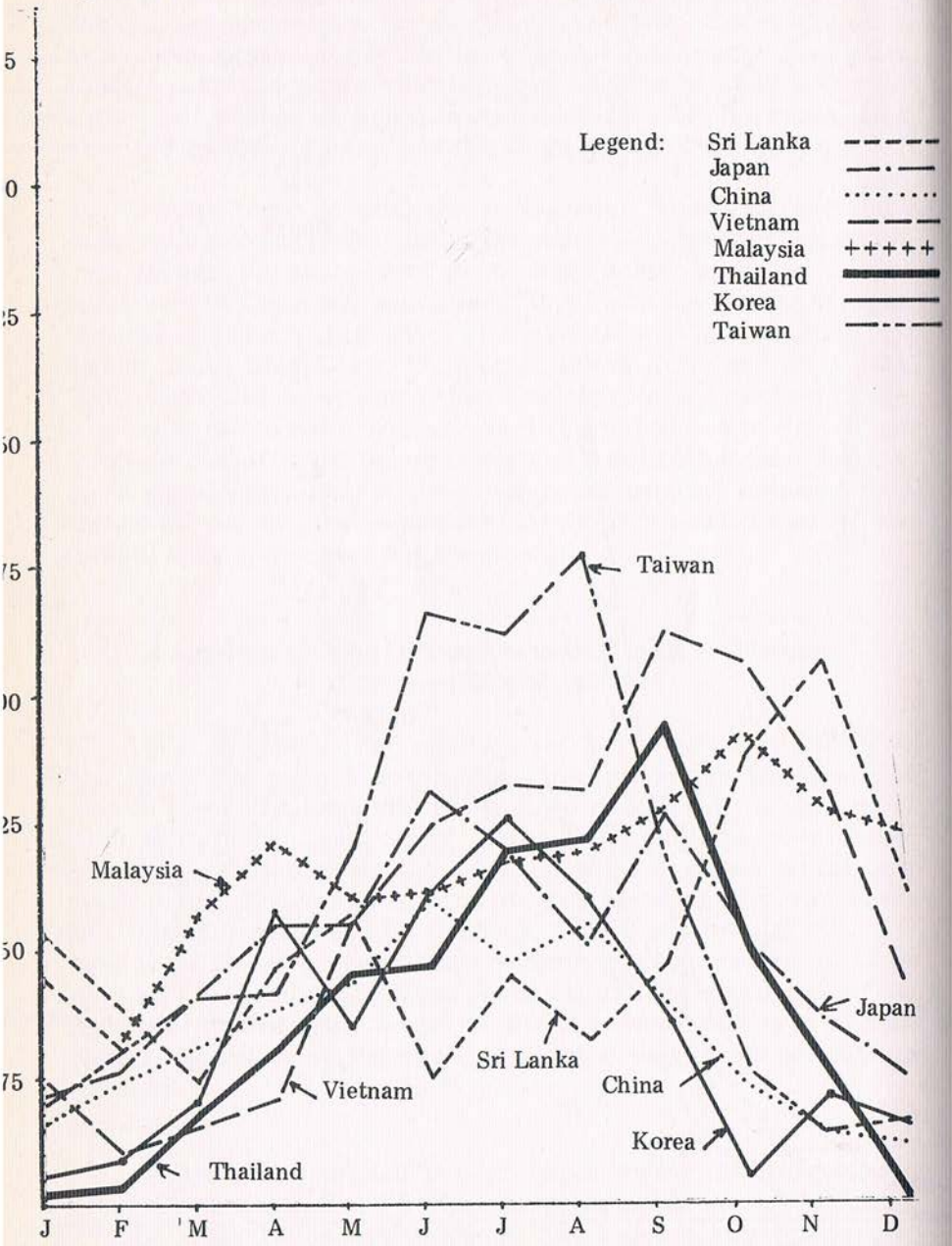

Chart 3 — Countries with Low Peaks of Rainfall

China, Korea, Vietnam, Japan, etc., the peak is less pronounced and is lower than in the average pattern. There is no conspicuous mode in the third pattern, though rainfall is heavy enough in the summer months for paddy rice; but there is a mini-monsoon in the winter months which enable perennial crops such as rubber, tea, palm oil, coconuts, and so on to thrive. It is in these countries, Sri Lanka, Sumatra, West Malaysia, and the Philippines (Mindanao, Bicol) where the plantations have been extensively established.[9] With even rainfall, employment during the drier months can be found in the perennial crops during their harvesting, reducing the labor supply for nonagricultural labor market. Besides monthly patterns, the annual average rainfall (see Appendix Table 1) is also of some consequence. In Thailand and Nepal where the rainfall is one half of the average in the Philippines, livestocks, vegetable and fruit raising and other agricultural operations after the main harvest are more difficult and more labor is available for nonagricultural activities. And with heavier rainfall throughout the year, small irrigation works are easier to construct.

The extent of irrigation is partly a product of historical legacies, as it takes a long period of time to construct major dams and drainage works. East Asia including China with less average rainfall started the postwar era with a larger irrigation network than other regions. This in turn, meant that rice growing in the wet months had grown over the centuries to be much more labor-intensive, so that the labor force looking for nonagricultural employment was much larger.

On the demand side of the nonagricultural labor market, the main forces are the extent of labor-intensive, decentralized manufacturing and the stock of transport, communication, and other infrastructure which can be used by farm families to reach the labor markets. Institutional forces in the postwar decades are also important, as will be noted below. In the beginning of development in the postwar era, the forces on the demand side may be taken to be historically conditioned.

The analysis of variations across countries of the shares of nonagricultural incomes in Table 1 is difficult as data on shares for most countries are not available for the early 1950s. For Japan and Taiwan, it was around one-third. These levels are similar to those of Nepal and Sri Lanka, countries with relatively low rainfall

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[9] *The Pattern of Asia*, ed. by Norton Ginsberg, pp. 54,374,496, New York: 1958. The monsoons do not reach most parts of Hokkaido, Manchuria, North and West China, Pakistan, Punjab, Irian Jaya, and elsewhere which comprise non-monsoon Asia, where the main staple crop is not rice. It is in monsoon Asia where more than 90% of Asia's "teeming millions" live.

averages. Table 1 shows Sri Lanka with 37 per cent in 1963, and Nepal's 36 per cent in 1977 may represent the 1950s as Nepal developed very slowly in the postwar decades. The low levels in China in 1978 are due to Maoist policies severely restricting peasant movements and activities in the informal sectors which are the major sources of nonagricultural activities in the early stages of the transition. Note that with the relaxation of these policies under Deng since 1978, the share is rising rapidly as the peasant families are encouraged to open up small informal enterprises such as eating places, trading, handicrafts, diversified agriculture, etc.[10] The low share of the Philippines in the 1960s may be due to the importance of the sugar and coconut industries which provided jobs during the dry months, of marine fishery along the coastal lines of thousands of islands, and the more even rainfall in Mindanao, Bicol and other regions facing the Pacific Ocean. The share is low in high income Malaysia with its vast plantation sector and extensive irrigation. (See Appendix Table 1.)

The low levels in Bangladesh despite its pronounced rainfall patterns may be attributed to the almost complete loss of handicraft skills and the insufficient development of modern industries under long periods of exploitive British rule. Shares may turn out to be low for Burma and India which went through similar experience under the British. In the case of Nepal, the mountain ruggedness was too much of an obstacle for British traders, so that village crafts were better preserved. Thai levels are high partly because average rainfall is low and the extent of irrigation is limited.

If we turn to the differences in the trend of shares, it is possible to identify several forces. In China before 1978, the very low level (no more than 3 per cent in 1978) may be interpreted to show slow growth during the entire Mao period. Besides virtually banning informal activities and movement to the cities, Mao's heavy industrialization strategies from the early 1950s reduced work for the peasants in the formal sector. Capital-intensive industrialization meant that seasonal work for peasants was minimal as the big factories had to be operated fully round the clock to make full use of the costly machines. The large demands made by heavy industries on existing resources left little for the development of labor-intensive industrialization, which could use the part-time labor of the peasantry.

[10] It is reported that north of Shanghai in Jiangsu, small industries in the rural areas have grown so rapidly that they were challenging the supremacy of Shanghai as the main industrial city of China (*Far Eastern Economic Review*, July 18, 1985). These industries were the only source of employment for the rural families whose farms have reached maximal yields and who were constrained by the limited migration to Shanghai.

Similar statements may be made for South Korea which in the 1970s started on an accelerated capital-intensive strategy focusing rsources on 50 or so big firms known as Choebol. As in China, these large enterprises had to be concentrated in a few places, either near the sources of raw materials for the upstream industries or near large cities for the externalities required by big industries. Philippines, though to a lesser extent than China or India, opted for capital-intensive industrialization heavily concentrated in or near Manila.

In contrast, industrialization in Thailand and Malaysia was labor-intensive and decentralized. This meant that construction of roads and other infrastructure and services, all of which are supportive of manufacturing, were more dispersed, opening up opportunities for farm families in different regions. The sharp increases in Japan and Taiwan had their origin in the agricultural-based and regionally-dispersed labor intensive industrialization strategy in the earlier post-war decades, and the early attainment of full employment and labor scarcity. Unable to obtain labor in the large cities, small enterprises moved out of the main cities. Rising farm wages led to extensive mechanization of farm operations, freeing members of farm families to take on full-time as well as part-time jobs in the nearby towns and cities.

Although in the nonmonsoon economy of the U.S. levels are low relative to its high per capita incomes both before and after World War II, the shares have been rising steadily though slowly — from 46 per cent to 97 per cent. The reason for this throws some light on the experience of Japan and Taiwan in the 1970s. In a highly developed economy such as in the West, agriculture becomes predominantly commercialized and diversified, and activities in agriculture become increasingly process-intensive, requiring a great deal of milling, packing, preserving, hauling and servicing. After harvesting, some of the large army of field laborers on the large farms of the U.S. (comprising as much as 1/3 of the total farm workforce) move from the fields into mills, canneries, and factories, joining their wives already working in them. United States figures show that wages and salaries in the manufacturing of food, tobacco, paper/pulp, and lumber products were five times more than wages and salaries in agriculture in 1976, compared to three times in 1938.[11]

[11] Data are in the paragraph from official national accounts and *Statistical Abstract*, both published by the U.S. Commerce Department, Washington, D.C. There is also the tendency for urban dwellers to purchase farms and work on them during weekends. But the farm income figures exclude income of nonresident farm operators *(Historical Statistics of the U.S.*, p. 473).

Trends and Developmental Stages

With the foregoing insights and those obtained in a number of case studies reported at the various conferences,[12] we describe the growth of nonagricultural shares and their composition as the economy moves from one stage to another in the first or industrial transition. Details are left out as there is much that needs to be known but an attempt to link broadly but systematically the trends in the shares and the overall development may be useful in providing a framework for identifying gaps in further research.

In general, in the early stage of the agro-industrial transition, nonagricultural employment of farm families is largely traditional, whether in manufacturing, construction, transporting, and in services, mainly hand-work using minimal modern equipment. On the supply side, the labor offered is largely seasonal, as work on the farms during the wet seasons utilizing traditional equipment demands much time. In the middle stage, the use of semi-mechanized equipment in nonagricultural employment begins to spread, replacing traditional employment and paying better as productivity increases. The increasing use of powered cultivators and threshers speeds up

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[12] Some of the conferences were the Asian Productivity Symposium in New Delhi, October 1981, Australian National University Conference in Chiang Mai, August 1983, and the United Nations Center for Regional Development Seminar in Nagoya, October 1983. See *Seminar Reports on Rural Industries and Off-farm Employment*, International Seminar on the Role of Rural Industries for National Development in the Asian Region, April 1985, Seoul. Some of the papers used were: R. T. Shand, "Agricultural Development, Non-Farm Employment and Rural Income Distribution: A Case Study in Kelantan, Malaysia;" Samuel Ho, "Rural Nonagricultural Development in Asia: Experience and Issues;" R. Fabella, "Rural Nonagricultural Employment: Contribution, Composition and Determinants;" G. K. Chadha, "Agricultural Growth and Rural Nonfarm Activities: An Analysis of Indian Experience;" P. Kasryno, "Structural Changes in Rural Employment and Agricultural Wage in Indonesia;" R. Islam, "Productivity and Equity Considerations in Policies for Rural Industrialization: An Analysis Based on Some Asian Experience;" R. Minami and F. Makino, "Choice of Technology: A Case Study of the Japanese Cotton Weaving Industry 1902-38;" T. Onohan, "Development of Rural Industries in Thailand; Problems, Policies and Programs." Also see from the Chiang Mai Conference, Kosit Panpiemras, *Rural Industrialization in Thailand;* P. Park, *Off-Farm Employment in Korea, Current Status and Prospects;* H. M. G. Horath, *An Exploratory Study of Off-Farm Employment and Incomes in Sri Lanka;* M. Hossain, *Employment Generation Through Cottage Industries: The Case of Bangladesh, Asian Regional Team for Employment Promotion*, ILO Bangkok: 1984. Recently two volumes were published from the Asian and Pacific Development Centre: *Development and Diversification of Rural Industries in Asia*, 1984, and *The Rural Non-Farm Sector in Asia*, 1985 both edited by Swapna Mukhopadhyay & Chee Peng Lim, Kuala Lumpur.

work on the farms, releasing labor for off-farm activities. In the later stages, the use of fully mechanized equipment in manufacturing, modernized transport and construction opens up new avenues of nonagricultural employment further away from the villages while the supply of labor for off-farm work rises with more mechanized equipment for transplanting and reaping, and workers are available for longer periods than the dry months. Year-round availability of labor opens up opportunity to work in factories utilizing machines and paying higher wages. The emphasis below will be on the demand side of the labor market as it is more important than the supply side in determining the incomes earned in nonagricultural activities.

In the earliest stage of the transition, the carbohydrate products of agriculture require relatively little processing, the most important being rice milling. For economies with crops of tree and shrub, there is more processing of perennials such as rubber, palm oil, coconut, cocoa, sugar, tobacco, lumber, etc. In the early stage most types of nonagricultural activities are carried out in the homes and adjoining shops of villages and towns where foods, handicrafts and artisanal products are made with few workers, most of them fully active mainly during the seasonal slack months only. Raw materials are obtained from farms, forests, and rivers, and the technology is comprised of hand-tools often requiring traditional dexterity and know-how passed on from one generation to the next through apprenticeship systems. Capital requirements are minimal, and marketing is local, confined to the surrounding villages or the nearby towns. Hence, transport and communication needs are limited, and commuting to work is infrequent. In these traditional industries dominated by hand work, productivity and remuneration are low, with wages tending to fall below those in agriculture.[13]

The pattern of industries in Nepal, Bangladesh, and India suggests the predominance of handicrafts and artisanal work and food processing whose output are clothing, food, household articles such as utensils and furniture, and farming inputs, most of which are not readily obtainable from the cities. In India and Bangladesh, the list includes grain milling, oil crushing, fruit and fish drying, dairy products, hand-loom weaving, knitting, garment sewing, silk reeling, blacksmithing, brick and tile, paper making, leather processing, clay, pottery, and mat making, basketry and bamboo articles, carpentry, fishing nets, rope making, brush making, etc. (Islam 1985, Hossain 1984). Very little powered equipment is used; electric power is not available in the villages and even in the towns, while

[13] See Samuel Ho, *op. cit.*

diesel engines are beyond the means of most families. Where perennial crops are grown, seasonal work is available in the processing of coconuts, tea, sugar, rubber, banana, jute, lumber, etc. (Horath 1984). In China with the restrictions on cottage industries and the promotion of large industries, handicrafts comprise only 2.5 per cent of off-farm incomes *(Statistical Yearbook of China 1981).*

In the early stage, transport, construction, and services are important sources of nonagricultural employment, although earnings are low. The carriages and carts are hand- or animal-pulled, and construction is entirely muscle-work. Peddling, vending, hawking and other forms of petty trading are important because of the limitations of transportation which lead to numerous, small, localized markets and marketing. With the large pool of poor peasants who can be easily hired to work the farm and of domestic servants for housework, the richer peasants and the more educated families are free to do the salaried white-collar work such as in administration and in schools. Thus, the volume of off-farm activities in the early stage is large in employment terms but low in value because of low productivity and earnings, which on a per day basis are lower than in agriculture.[14]

In the middle stage: Superimposed on the traditional off-farm activities described above are the emerging semi-modern ones. With the rise in per capita farm incomes as the economy moves away from the early stage, the demand for nonagricultural production increases, expanding the market for processed foods, clothing, household articles, kitchen utensils, services, and farming inputs. By this time, import-substitute industries in the cities are established and are able to supply these needs, making inroads into the markets of traditional handicrafts. But this is more than offset by the rise in off-farm activities in other areas. To transport urban products to the rural sectors, modern roads and other infrastructure connecting the city to the hinterland are built, supplying jobs for rural families. Commerce spreads into the towns and villages. Handicraft work may then be replaced by better paying work in construction, transportation, and services. With the increase in population and in per capita incomes, demand for rice expands, and the need for more irrigation, drainage, extension and other public services in agriculture becomes another source of off-farm activities as the economy grows

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[14] For wage data see Chadha, Islam, Horath, *op. cit.* Also Q. K. Ohmad and M. U. Ahmad and M. U. Ahmed (1984).

out of the earliest stage. And the completion of infrastructure connecting increasing numbers of villages near the urban centers or to railways and trunk roads opens up opportunities to commute or migrate seasonally to urban work paying better wages.

The rise in per capita incomes and urbanization shifts food purchases from inferior grains and root crops to rice, and there emerges the demand for diversified crops, especially fruits, vegetables, pulses, animal and fishery products, most of which are more process-intensive than the cheaper crops. There is an expansion of agro-industries in cleaning, preserving, canning, refining, packing, hauling, warehousing, and so on. Generally speaking, the semi-modern, industrial activities are higher-valued, as they use more capital-intensive technologies, some of them semi-automatic and power-driven, and larger-scale than handicraft production in the homes. This is particularly true with the labor-intensive, urban factories to which farm workers begin to commute to work longer than a season. Construction and transportation begin to use more equipment, some diesel-powered, as in the making of cement blocks, tiles and bricks, and in the operations of tricycles, motorcycles, and power-driven boats. And services become more sophisticated, requiring higher levels of education and equipment. Accordingly, in the middle stage, there may be a trade-off between diminishing man-days of traditional off-farm activities and emerging higher-valued, semi-modernized ones, the latter more than offsetting the decline in quantities so that the share of nonagricultural incomes tends to rise.[15]

In Thailand (1975/76) only one-fourth of nonagricultural incomes came from manufacturing, mainly from food-processing and textiles, one-half from services and the rest from construction, transport and mining. The large amounts from construction are due to the haste with which Thailand's inadequate physical infrastructure had to be built up, as it tried to catch up with neighboring countries where colonial regimes in prewar decades had started earlier infrastructure construction. In the Philippines, rural manufacturing is also dominated by food, textiles and wood products. As in Thailand, services dominate off-farm incomes in West Malaysia as shown in the 1970 Census of Population, and food, textiles, and wood products loom large in Malaysian manufacturing. In Java, services, cons-

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[15] For a discussion of the shift from hand looms to semi-and fully-automatic power loom in the first decade of this century to the second and third, see R. Minami and F. Makino, 1985; 98 per cent of weaving in 1907 was by hand looms, declining to 63 per cent in 1920, and 15 per cent in 1938.

truction, and small industries (food, textiles and cottage) are important. In Taiwan (1966) about half-of nonagricultural incomes was from services, the other half from industry of which manufacturing comprised only one-fifth.[16] Thus, in the middle stage, perhaps because of the decline of handicrafts, services dominate, followed by construction.

In the later stage, off-farm work in manufacturing increases faster than in construction and services, each contributing about one-third of off-farm incomes. Cottage and handicraft industries continue to decline but are more than offset by the expansion of factory industries and large workshops, using semi- and fully-automatic equipment. As the import-substitute, labor-intensive industries mature, they begin to export abroad. Commuting and temporary migration to these industries become cheaper and more convenient as the expanded infrastructure and motorized transports (buses and railways) become widely available. Earnings from work obtained by commuting and seasonal migration begin to loom large, offsetting reductions from traditional handicrafts.

There is an expansion of crop diversification which begins to rival rice production, and the commercialization of agriculture supplants subsistence farming. Processing industries become a major source of off-farm incomes in the rural areas as the fruits, vegetables and animal products are prepared for marketing to the cities and elsewhere. Where plantation crops are extensive, their increased exports expand job opportunities in the processing plants.

Construction tapers off as the major infrastructures, trunk roads, irrigation, and electrification, and the system of schools and local administration near completion. Trading by the larger commercial and industrial units reduces the need for petty commerce.

The data for Japan in 1962 indicate that somewhat more than one-third of the agriculturists worked in construction, another third in manufacturing, mining, and transport, and one-fourth in the services. Since earnings from the latter are higher than in construction, these in terms of incomes will raise the service incomes to about one-third. In Taiwan in 1975, services seem to be somewhat more important than construction and manufacturing, with handicraft declining to 4 per cent. In South Korea in 1960, two-thirds

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[16] Kosit Panpiemras, *op. cit.* for Thailand, R. Fabella, *op. cit.* for Philippines, D. Anderson and M. Leiserson (1980) for Malaysia and Taiwan, and F. Kasryno, *op. cit.*, for Indonesia.

of rural, nonfarm employment were on services and the rest in industry with manufacturing accounting for 18 per cent, rising to 30 per cent in 1980 while services fell to 50 per cent.[17]

Beyond the first transition: It is in the second transition that a major acceleration in nonagricultural income occurs. Only in Japan in the mid-1960s and Taiwan in the mid-1970s did nonagricultural incomes rise to equal farm income. These were the years in which both countries not only moved into the second, industry-to-service transition but they were also the years when signs of labor scarcity were appearing after half a decade of full employment, beginning around 1960 in Japan and 1970 in Taiwan. During the years immediately after full employment, labor scarcity was not felt in the cities as the migration of young workers from the farms and the entry of urban housewives into the labor market satisfied the needs for urban industrial and service expansion. But after a period of rising migration and increases in female labor force participation in response to rising wages, the flow of workers from these sources slowed down, particularly to the largest cities. Thus, the acceleration in nonagricultural incomes coincided with the slowdown in Japanese migration around mid-1960s. Migration to the two largest cities, Tokyo and Osaka, reached a peak in 1965 although for the other large cities, the peak was reached between 1965 and 1970.[18] Hence, with the slowdown of migration to the main cities, small industries migrated to the smaller cities, generating job opportunities for those residing near them.

As the larger cities begin to fill and with costs rising, the advantages of locating in them decline for the smaller firms, especially those not needing the varied externalities only the big cities can offer, such as rapid and efficient communication and transportation, and large numbers of experienced skills of specialized workers. These are the firms which can use the cheaper, less experienced labor obtainable in the outlying cities, large towns and villages of heavily populated agricultural districts. The spread of secondary educational facilities to these areas becomes the source of young workers with the requisite education for mechanized production. They can be paid

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[17] Korean data from Y. B. Choe (1983); Taiwan data from *Family Income and Expenditure, 1975*; and Japan data from *Employment Status Survey 1962*.

[18] See data in the *Japan Statistical Yearbook, 1969*. See also A. Speare and Paul Liu, (1977), where the authors find that one-fourth of the workers in the smaller cities preferred to live on the farms nearby, since commuting "enabled them to help with farming and housekeeping on weekends" besides cheaper living costs.

wages much lower than in the big cities as food and dwelling costs are cheaper while commuting costs are minor with good roads and shorter distances.[19] Reenforcing these advantages are the congestion, pollution, and the rising costs of living in the metropolis. It is with the migration of smaller enterprises that nonagricultural incomes rise substantially and rapidly.

The Japanese Establishment Census of 1981 reported that one-third of total employment in manufacturing establishments outside Japan's 11 major cities was in food, textiles, garments, wood products, and ceramics and another one-third in the production of fabricated metals, machinery, transport equipment and instrument. The latter grew faster than the former in the postwar decades, and called for more male than female workers who commuted by trains and buses to the nearby cities and towns for full-time work, leaving farm work to the females and older folks. In turn, this meant that farming was to be mechanized with small, light-handed equipment which women can handle, but without economies of scale. Without the release of large numbers of workers through mechanized rice farming, the increases in nonagricultural incomes could not have occurred as they did after full employment was reached when the supply side became more important than the demand side in the nonagricultural labor market. In Taiwan there were more females than males among the off-farm workers, and this was related to the greater proportion of light-handed jobs in the production of textiles, processed foods, drugs, plastic and handicrafts than metal products.

Beyond the second transition into the service society: The time it takes for the completion of the second transition is far less than the first, a matter of one or two decades. The reason is that demand elasticity for services is higher than for industrial products while the potentials for the use of labor saving mechanization are much lower in the services.

Despite the rise of manufacturing, from 25 per cent in 1962 to 31 per cent in 1979 as a source of employment, there was no decline in the services which rose slightly from 29 per cent to 30 per cent, although construction fell from 38 to 31 per cent *(Employment Status*

[19] In the visits during the Seoul Conference in 1985 to two factories in Ansung, one producing grinders and another roller chains, both of relatively low technologies and small machines, cheaper wages were a major attraction to the town.

Survey 1962, 1968, 1979). The service sector was holding its own as Japan completed the second transition and moved into an economy dominated by modern services as in the West. Construction based on the needs of agriculture and industry was losing the importance it had in the first transition where the basic physical infrastructure for modern agriculture and industry had to be constructed. Unlike in the first transition, trade declined and was replaced by personal services as the dominant activity in the service sector. Within personal services, it was not the domestic services but in the higher-valued services such as in education, health, recreation and culture where the increases occurred. Domestic services declined drastically as consumer appliances replaced the services of maids, cooks, and gardeners whose wages rose with full employment. In the service economy, instead of carbohydrates dominating agriculture, the need for less energy by workers using powered equipment transformed agriculture into a producer mainly of diversified products as in the U.S., and these called for more processing than energy foods, opening up additional jobs for farm families.

The favorable impact that nonagricultural employment has on farm family income is through the reduction of underemployment in the slack months of the drier seasons in the monsoon rainfall pattern. It is not only the pronounced seasonality imposed by the monsoon on Asian agriculture but also the great labor-intensity of paddy farming and the consequent tiny size of farming that leaves the Asian farmer with much less to do than his counterpart elsewhere in the world. We conclude this paper with a brief discussion on the impact on the distribution of family incomes, on population growth, and policy prescriptions.

In Japan, Taiwan and South Korea, we have found elsewhere that income disparities were substantially reduced because nonagricultural incomes of the smaller farms increased more than those of the larger farms and as a result savings also increased more.[20] This is because the smaller farms tended to have more surplus labor per family during the dry seasons since the larger farmers had more hectares to work on and with more irrigation for dry season crops. But in the early stage of the transition the impact may not be favorable since with insufficient nonagricultural employment, richer farmers with better education and with income to hire landless workers to do their farm work may be in a better position to take on the high

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[20] See Appendix Table in *Economic Development and Cultural Change*, *op. cit.*, October 1985.

paying jobs, especially white-collar jobs in administration, teaching, and the like, as shown in some of the micro studies. In the early stage, the intermittent handicraft work may not be sufficient, and small farmers must rely on low paying construction work. If so, off-farm work in the early stages may not contribute to reducing disparities *within* agriculture, even though it may contribute to raising agricultural incomes relative to the rest of the economy, reducing between-sector disparities for the economy as a whole.

Nevertheless, macro evidence for the entire agricultural sector in countries during the early stages has not yet been presented. Conceivably, off farm-incomes may be poorly distributed at the initial point of time for some sections of the country, but overall and over-time as the handicrafts decline and other activities rise, the distribution may improve even though at any point of time for a particular section the distribution may be unfavorable to the lower income families. Similarly, nonagricultural incomes may be more favorably distributed in the more developed parts of a country where more modern industries and services provide lower income families with better opportunities than in the backward sections.[21] We need more overall data of the sort available for Japan, Taiwan and South Korea.

As to implications for population growth, I have noted elsewhere (*Population and Development Review*, December 1983) that under full employment conditions, the substitution of machines for unskilled labor reduces the demand for labor and children as parents perceive that their children must have the requisite education and skills for future jobs. More education raises the cost of children as they stay longer in schools and cannot take on jobs to help the family finances. Also, employment of housewives raises the opportunity cost of taking care of children in the homes. Similarly, nonagricultural employment not only of housewives but of husbands, older children, and grandparents reduces the time that can be spared for the care of children. Commuting time to towns and cities likewise reduces time for children. Thus, the reduction in underemployment lowers the time available for child care. It may be partly for this reason that total fertility began to fall sharply in Japan from the early 1960s, Taiwan from the later 1960s and South Korea in the early 1970s (*Population and Development Review*, December 1983).

Furthermore, by making possible more food and health services, increases in income from nonagricultural employment in the poorer

[21] See R. T. Shand for discussion on a backward area (Kelantan) in Malaysia, and Islam on South Indian countries, *op. cit.*

farmers tend to lower mortality and hence fertility. And after the education of the children is completed, the larger incomes can be saved for the purchase of tangible and financial assets which go to secure the future when the time comes to retire, thereby reducing the need of more children for security.

But in the early stage, the problem may not be straightforward. With the growth of nonagricultural work, the demand for labor increases, and without mechanization to meet the demand, lower income peasants may opt to have larger numbers of children, hoping in the future to have more earners in the family. Thus, discussion on income distribution and population points to the desirability for countries in the early stages to plan for full employment as soon as possible in order to reap the full benefits of nonagricultural incomes.

Policy Implications: Besides favorable distributive and demographic effects, it was previously noted that nonagricultural activities for farm families help to slow down the growth of diseconomies from congestion and pollution in the major cities. Development strategies for countries in the first transition should give high priorities to the promotion of nonagricultural activities. This entails a predominant labor-intensive strategy for multiple-cropping and the regionalization of industry in the first half of the transition with priorities for constructing requisite physical infrastructure, and gradually shifting to a more capital-intensive strategy with less emphasis on agriculture and more on industry. Heavy industrialization as in India and China at the outset of development is unfavorable to the growth of nonagricultural incomes. The Taiwan experience supports the view that direct policies such as industrial locations, entrepreneurial training, and so on are not necessary if the basic developmental strategy is an appropriate one, and in some cases may be wasteful. This is not to say that a small industry institute providing marketing information, industrial extension on management and technological know-how, and selective credit can not be valuable, especially if administered efficiently.[22]

The question has been raised in the Seoul conference that the potentials for irrigation may not be sufficient to raise farm incomes to full employment levels in Southeast and South Asia, considering

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[22] For an excellent review of policies undertaken by countries, see Chapter I of *Development and Diversification of Rural Industries in Asia*, APDC, *op. cit.*

the recent decline in ADB and IBRD financing of irrigation projects. But this has been due to the rapid progress toward self-sufficiency in rice in some of the countries and not to the lack of irrigable land. As shown in Appendix Table 1, the share of irrigated land in total arable land is much lower in most countries outside of East Asia, one-half of Taiwan in Thailand, Indonesia, and the Philippines, one-third or less in India, Bangladesh, Burma, and Nepal. In the case of the Philippines the National Irrigation Authority estimates that at the end of 1984, irrigated land was only 45 per cent of the irrigable land. Except for Nepal and Thailand, these countries get more rainfall than East Asia.

Irrigation for diversified crops in the dry seasons requires less water than rice growing in the dry season, but the costs of such irrigation may turn out to be greater, requiring sprinklers in some cases.[23] It is important that in the cost-benefit computation for the construction of diversified irrigation facilities, a major nonquantifiable benefit should be taken into account. This is the crucial role diversified crops play in the attainment of full employment, not only in the growing of the crops but in the processing, transporting, marketing, and exporting. Indeed, the hope for tropical Asia is that diversified cropping may be able to play the same role that animal husbandry did in the past for the West. With the prospects of wages and incomes doubling in East Asia by the late 1960s, the export markets for agricultural products appear most promising not only in Japan and the NICs but also in Western industrialized countries. With China moving quickly to become the world's main exporter of low quality shoes, apparel, textiles, ceramics and wood products, (while using the export earnings to buy machinery from Japan and the West), with the NICs specializing in the export of light machinery and equipment, and Japan in heavy and sophisticated machinery, the main hope for tropical Asia in achieving full employment may

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[23] In conversation with Dr. Kunio Takase, head of the irrigation section of ADB, I learned that ADB is now thinking of shifting to diversified crop irrigation. It is experimenting with different types of non-rice irrigation in the Philippines and Indonesia. See also Takase's paper jointly with Saburo Okita in *The Developing Economies and Japan* (1980), where irigation rate computed as share of rice land is more widely dispersed than irrigation as share of arable land, with Japan in the lead with 98 per cent and Taiwan with 70 per cent and Cambodia, Bangladesh, Nepal, Laos (with the lowest per capita incomes) only 10 per cent or less, and South Vietnam and Burma, less than 20 per cent.

lie in the export of diversified agriculture.[24]

However, there is one caveat that the experience of Japan points to, and that is the dictum that too much of a good thing is not good. From the later stage of the second transition and beyond, the expansion of nonagricultural activities may be undesirable. It is widely known in Japan that its small farms and their low productivity per workers are major contributors to the high cost of food in Japan and to political pressures to maintain protective tariffs and subsidies and that there is a need to convert to large-scale farming, using large scale technologies (bull-dozers, airplanes, combines as in the West). It is not sufficiently recognized that the large incomes earned by adult males commuting in subsidized trains and leaving their wives and others to grow rice in small plots are an essential prop to the whole system of petty farming. Without the large earnings from commuting, small farming in Japan could not have prospered so long, since average family incomes from farming would amount only to one-fifth of present levels.

Japanese farm families have come to enjoy this combination of farming and non-farm activities. They can live in large houses free from congestion, pollution, and noise of the cities, enjoy most of the amenities of urban living with T.V., cars, electrical appliances, etc. with the men getting incomes as high as in the cities, and the wives earning incomes probably higher than in urban jobs, while living costs are lower — surely the best of two worlds. If so, nonagricultural incomes may contribute not only to the perpetuation of monsoon petty farming and its high costs, but perhaps to the unduly small-scale nature of the industries and services in the nearby towns and small cities. All these make it politically difficult to adopt policies to liberalize the importation of farm produce, contributing to international tensions, besides high living costs. The historic mission of non-farm activities in monsoon Asia was to supply work in the slack season to supplement farm incomes, and not the

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[24] On the importance of full employment in accelerating growth, see my paper in *Singapore Economic Review*, October 1984. In Japan, more than offsetting the drop in labor inputs per hectare of rice production (of about 20 per cent during the 1950s), was the doubling of production of fruits and vegetables, animal, fishery and forestry products in the 1950s, most of which were produced during the season after the main rice crop was harvested. The same pattern of agricultural restructuring - shifts from grain and potatoes, to diversified crops and animal and fishery products - occurred in Taiwan and South Korea in the 1960s and 1970s, although somewhat slower in South Korea than in Taiwan.

other way around — farm incomes to support nonfarm incomes — thereby unduly prolonging the life of petty agriculture of monsoon Asia.

Implications for further research on the problem of too much nonagricultural incomes will be needed to specify at what point in the second transition off-farm activities should be discouraged. Taiwan may already have entered such a phase, while even South Korea and Malaysia — still far from this point — may want to know ways of increasing nonagricultural activities to minimize problems later on. For other countries, the worries are far off, but even for them a study of regional patterns of off-farm activities may be valuable in planning the construction of long-lasting irrigation, roads, electrification, and other infrastructures. Japan, Taiwan and other countries, in order to enlarge farming scale, have been exploring various programs of group farming; the successes and failures of the programs and implications on nonagricultural activities need to be looked into.

One large gap in our knowledge is the regional patterns of such activities in each country. Scattered studies, often by-product of other research and for haphazardly selected regions, seem to indicate that the regional variations are considerable at least during the first transition. But no country we know of has comprehensive, systematic infomation for carefully selected locations within a country. Until we get this for a few countries, our knowledge of levels, composition, and trends in nonagricultural activities may not be on a firm basis for policy formulations. After a few such studies, it may be possible to devise questions to be attached to the periodic household income and expenditure surveys, and then by the next decennial agricultural census, more comprehensive questionnaires can be made out to be sampled in the census.

Postscript: Something unexpected has happened since writing the above article, which may have extensive (perhaps revolutionary) inpact on the growth of the economies of East and Southeast Asia. And that is the rise of the exchange value of yen to levels as high as 160 per U.S. dollar. It remains to be seen whether the yen will stabilize on this level (or even the 150 level as some think). My guess is that the high value of yen is here to stay, not because it is mainly the result of U.S. budget deficits but because Japanese industrial productivity has been growing at rates of about 2 to 3 times over the past decades more than the rest of the industrialized countries, especially the U.S. If so, we need to begin thinking and discussing what

it will mean to Southeast Asia. Before this unexpected event, my outlook for the rest of the country was on the gloomy side but if the yen stays high for the next decade or so, things may turn out to be far better for Southeast Asia, especially for the Philippines which is so close to the dynamic East Asian region.

Already, the industrial exports of Taiwan and South Korea are booming with large increases in exports to Japan of machines, and their parts and components. Small firms of Japan for whom the high yen is greatly overvalued are preparing to move out to the NICs and Southeast Asia, to produce and to export to Japan. And as the pace of industrialization accelerates in Taiwan and South Korea, the agricultural sector will decline, and Southeast Asia can begin to export labor-intensive diversified agricultural products and lower-valued labor-intensive industrial products, not only to Japan but to Korea and Taiwan. All this will mean large increases in off-farm employment for the farm families of Southeast Asia.

Southeast Asian countries should take action to get its share of the benefits of the new era opened up by the high yen. The high yen will help to surmount the tariff walls but it is true that nontariff barriers remain. We should begin thinking in terms of regional conferences which will induce changes in these barriers. And this time the chances of changes are better for the high yen may force Japan and the NICs to turn their attention to trade from the West to the East. Their fate now is more bound up with Asia and if East Asia does not buy more from Southeast Asia, the latter may go ahead in a big way with second-stage import substitution instead of buying the more efficient industrial product of East Asia. Thus, the yen may open up prospects for better successes in the solution of regional cooperation and coordination. I may be too upbeat with the future prospects but I am glad to end this paper on the upbeat rather than the downbeat side, as so many papers often do.

Appendix Table 1 Miscellaneous Data on Agriculture and Farm Employment

	Farm land per worker (1000 ha.) 1975	Average Rainfall (in.) 12 months	Wet	Dry	% of irrigation to arable land 1961-65	1970	1975	Multiple cropping index 1960s	% of land in permanent to arable land (1975)
East Asia									
Japan	0.7	67.0	43.9	23.1	58.3	55.2	54.1	126	13
Taiwan		77.6	59.4	18.2	62.6	63.5	66.2	184	
S. Korea	0.4	78.2	57.9	20.3	33.1	38.5	40.9	153	8
China		36.6	25.4	11.2	65.2	65.1	66.1		1
Southeast Asia									
Malaysia	1.7	88.8	48.8	40.0	48.8	37.9	48.0		370
Thailand	1.1	47.3	41.3	6.0	15.3	15.9	21.3		12
Philippines	1.0	84.1	62.3	21.8	18.5	24.8	27.1	136	54
Indonesia	0.6	94.0	78.8	15.2	33.5	32.9	32.8	126	39
South Asia									
India	1.0	78.4	69.9	8.5	16.2	19.0	19.9	114	3
Sri Lanka	0.8	67.3	37.3	30.0	50.9	52.0	49.2		121
Burma	1.5	88.8	80.8	8.0	6.7	8.4	9.8	111	4
Bangladesh	0.4	96.0	83.4	12.6	5.7	11.9	16.1	119	2
Nepal	0.4	50.6	47.4	3.2	4.2	5.9	9.1		

Sources: Farm land per worker and permanent land per arable land from *FAO Production Yearbook 1976*, pp. 50-52, 65-66; also irrigation per arable land, pp. 50-52, 57; multiple cropping index from Special Issue on Multiple Cropping in Asian Development, *The Philippine Economic Journal*, Number Twenty Seven, Vol. XIV, Nos. 1 & 2, 1975, p. 234; irrigation per arable land for Taiwan from *Statistical Yearbook 1984*, Table 4, p. 281.

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