AID/csd-2824
211(d)

COMPARATIVE ANALYSIS AND TYPOLOGY OF AGRICULTURAL DEVELOPMENT PERFORMANCE AND STRATEGY

ERIK THORBECKE

GUNARS DAMBE

OCCASIONAL PAPER NO. 5
APRIL, 1974

IOWA STATE UNIVERSITY 211-d GRANT PROGRAM

COMPARATIVE ANALYSIS AND TYPOLOGY OF AGRICULTURAL DEVELOPMENT PERFORMANCE AND STRATEGY

by

Erik Thorbecke

and

Gunars Dambe

Occasional Paper No. 5

April, 1974

Publication of this paper is funded under the AID/211-d grant to Iowa State University. All views, interpretations, recommendations, and conclusions expressed in this paper are those of the authors and not necessarily those of Iowa State University or theAgency for International Development.

The present paper is essentially Part I of Comparative Analysis of Agricultural Development and Employment Performance and Planning, FAO, Rome, 1974, a study prepared by Erik Thorbecke and Gunars Dambe under the auspices of the FAO.

The authors are grateful to FAO for allowing this part of the study to be reproduced in the Iowa State University 211-s Grant Occasional Paper series.

The above study is originally published as Agricultural Planning Study #18.

Foreword

Controlled experiments in economics are difficult to perform. Perhaps the closest approximations available in economic development are country case studies. Countries develop under different economic and social conditions. Not only are the initial structural and institutional conditions different but, in addition, policy objectives and development strategies vary. A comparative analysis makes it possible, within limits, to identify agricultural development strategies which have been relatively more successful in generating employment and leading to a more equal income distribution. Furthermore, such an analysis may suggest what strategy, or elements of a strategy, are appropriate and trasferable to other countries.

The authors undertook such a study* for the Food and Agriculture Organization (FAO) based on ten country and area case studies, i.e., Ceylon, Pakistan and Bangladesh, Japan, Indonesia, Morocco, Egypt, Central American, and Hungary. Occasional papers 3 and 4 in this series presented the Colombian and Ivory Coast case studies, respectively. In addition, occasional paper 2 was devoted to the case study of Taiwan which was not a part of the FAO study. The present paper (Occasional Paper 5) is essentially analogous to Part I of the above mentioned FAO study. It identifies on the basis of the country case studies, four distinct types of agricultural development strategies:

(a) The unimodal strategy,

(b) The bimodal strategy,

*Erik Thorbecke and Gunars Dambe, Comparative Analysis of Agricultural Development and Employment Performance and Planning (FAO, Rome, 1974).

(c) The "industrialization-first" strategy,

and (d) The socialization and collectivization strategy.

It is argued that the implementation of a unimodal strategy in agriculture may be most appropriate when relatively high weights are placed on the objectives of fuller employment and the achievement of a more equal income distribution.

Permission to publish the material in the present form has been granted by FAO for which the authors express their thanks.

INTRODUCTION

The purpose of this paper is to outline the analysis used in the recent study undertaken by the authors under the auspices of FAO to investigate the development performance of a number of selected countries with special emphasis on agricultural unemployment and underemployment and employment planning. 1/

The countries included in the FAO study are Ceylon, Pakistan (where the case of present Pakistan is distinguished from that of Bangladesh), Japan, Indonesia, Morocco, Ivory Coast, Egypt, Colombia, Central America (mainly Guatemala), and Hungary. 2/

A uniform format was adopted in these case studies to help compare the experiences, performance and development strategies of these countries. Each of the country studies was subdivided into three major parts: (1) a description of the existing situation during the sixties (and in some cases during the earlier periods) and the performance with respect to employment and other development objectives; (2) an analysis of the major factors responsible for un- and underemployment; and (3) a review and analysis of the development and employment strategies followed by each country.

1/ Erik Thorbecke and Gunars Dambe, Comparative Analysis of Agricultural Development and Employment Performance and Planning, FAO, Rome, 1974. This paper is essentially similar to Part I of the above study except for a few editorial changes. This study will be referred to as the "FAO study," for short, in the remainder of this paper.

2/ Japan and Hungary are the only ones of these countries which can be considered as developed (per capita income in 1970 amounted to respective $1270 and $1100). The reason for including Hungary in this sample was to explore how a centrally-planned socialist type economy approached the process of agricultural development and employment creation. Japan was included because it offers an example of successful agricultural development over the last hundred years which may provide a model to some of the presently developing countries.

Even though the case studies tend to emphasize recent performance, in some cases the historical development process was described in order to capture potentially important lessons regarding agricultural development and its impact on employment.

The FAO study consists of two major parts. The first part attempts to compare the performance of ten selected countries and to derive a possible typology on the basis of a number of criteria. This typology helps to identify the major constraints developing countries face in the process of agricultural development and employment creation. Furthermore, alternative development strategies are distinguished and their differential effects on employment and other objectives are analyzed. Part I is summarized in this paper. The second part of this study consists of the ten independent country case studies referred to previously.

A crucial warning has to be made at the outset regarding the quality of statistical information and particularly that relating to unemployment Not only is the quality of unemployment statistics relatively low, but, in addition, the definitions used by different governments and researchers vary considerably. In some cases, unemployment is defined narrowly as involuntary unemployment. At the other extreme there are instances where an "unemployment equivalent" concept is used which includes both unemployment and underemployment. Since various sources have been used in the case studies, unemployment information as between countries, and sometimes even within countries, is not strictly speaking comparable. Nevertheless, it is felt that the information used does reflect the degree of seriousness--if not the exact measure--of unemployment.

Comparative Analysis of Agricultural Development and Employment Performance

A. Comparative Analysis

One of the most serious problems which the developing countries are likely to face in the next few decades is that of unemployment. Until recently the major policy objective which the governments of the developing countries were striving for was an increase in average per capita income. It was felt that this goal was largely complementary with other policy objectives such as a high level of employment. Furthermore, to the extent that a conflict did exist between GNP growth, on the one hand, and employment and a more equal income distribution, on the other hand, the relative weight attached to the former was very high. The prevailing view was that it was more important to increase the size of the pie than to be concerned with ways of dividing it more evenly.

A number of factors have taken place in the sixties which forced a major re-evaluation of the above approach. Among the most important ones were a discrete jump in the rates of growth of population and labor force in the developing world; the lack of any significant improvement in the standard of living of the bulk of the population operating in the traditional sector which was largely unaffected by the income growth which did take place in the modern sector; the increasing awareness that neither fiscal nor other policies can be more than mildly successful in redistributing a given composition of output and finally, the increasing economic social and political pressures resulting from the rural-urban migration. These factors are clearly interrelated.

The population explosion contributed to the maintenance of very low standards of living in the traditional sector and since the bulk of the population is employed in agriculture, led to the migration out of that sector into urban centers. At the same time the promotion of industrial as opposed to agricultural development contributed to the increasing

inequality in the overall un- and underemployment in the urban areas and large-scale underemployment of labor in traditional agriculture.

The purpose of this section is to compare the agricultural development and employment performance and planning process of the ten developing countries included in the recent FAO study, namely, Ceylon, Pakistan and Bangladesh, Indonesia, Japan, Morocco, Ivory Coast, Egypt, Colombia, Central America (with special reference to Guatemala) and Hungary. Out of this comparison and the experience of other developing countries, not included in the present sample, a typology of agricultural development strategies is derived. It will be seen that the implications of these strategies for output, employment-creation and income distribution differ significantly.

Even though the initial conditions constraints vary from country to country, a certain degree of flexibility exists in the choice of a development strategy. This choice is influenced by the preference functions of the governments, i.e., the major policy objectives which are sought and the relative importance which is attached to each objective. At the same time the adoption of a given development strategy in agriculture may commit the government to a certain type of development process over a long period of time. This inflexibility may have at least two disadvantages. First, certain of the consequences of given strategies might not have been initially foreseen or accurately weighed in the decision-making process. In addition, the structural and institutional changes brought about by the policies and process corresponding to the chosen strategy may be very difficult to reverse. Secondly, the preferences of governments do change over time so that even when the future consequences of given strategies were accurately foreseen and corresponded to the objectives of the policy-

maker at the time of initiation, a change in the relative weights of these objectives may transform an initially desirable strategy into an undesirable one (or a less desirable one).

There is some evidence that both of the above phenomena occurred in a number of developing countries. Development plans were adopted without a sufficient understanding and realization of some of the negative features which would result from their implementation over time. Likewise, as was pointed out previously, the relative importance attached to GNP growth per se as the predominant, if not unique, target which was characteristic of many development plans in the fifties and early sixties has been reduced somewhat in comparison with other objectives such as employment and a more equitable income distribution.

A review of the ten case studies confirms the increasing seriousness of the un- and underemployment problem. 3/ The magnitude of unemployment has worsened both absolutely and relative to the size of the labor force in the developing countries included in the sample with the possible exception of the Ivory Coast. In two of these countries, i.e., Colombia and Ceylon, employment has become the primary policy objective and full fledge ILO missions were invited by these respective governments to help formulate an employment strategy. Morocco, likewise, in its present five year plan (1968-1973) specifies employment targets explicitly for the various sectors. The size of unemployment at the outset of the plan was so large and the projected increase in the labor force so substantial that no attempt was made in the plan to reduce the existing backlog of un- and underemployment.

3/ Japan appears to have resolved its employment problem from the outset through an appropriate choice of development strategy. So has Hungary, after going through a difficult period in the immediate postwar period.

The plan concentrated only in trying to formulate policies which would permit the absorption of the new entrants in the labor force. The bulk of this absorption was assigned to agriculture which is projected to provide productive employment to 57 percent of the new workers during the 1968-73 period. In Guatemala it was estimated that about 30 percent of the agricultural labor force was underutilized in the mid-sixties--with most of the latter being due to seasonal underemployment. The magnitude of underemployment in agriculture is estimated to be even larger in Indonesia reaching over one third of the total labor resources available.

Another phenomenon which appears to be highly correlated with the increase in unemployment is the tendency for the income distribution to become more unequal. Since the lack of productive employment opportunities reflects itself in lower incomes for those partially or wholly unemployed, the resulting increasing gap between the incomes of the richer and poorer groups can be considered to be the mirror-image of the unemployment problem. Thus, for instance, the income distribution worsened considerably between the two wings of Pakistan, a factor which undoubtedly contributed to the eventual secession. One source estimated that the ratio of per capita income in the western wing (now Pakistan) to that of the eastern wing (now Bangladesh) increased from 1.09 in 1950 to 1.61 in 1970. Likewise, in Guatemala, the relative share of GNP going to the eight departments in the Altiplano (which coincides essentially with the subsistence sector) fell from about 16 percent in 1951 to about 6 percent in 1966. Even worse is the fact that the absolute real per capita income level in this region which includes almost 40 percent of the total population of Guatemala, declined considerably over the same time span.

In Colombia, it was estimated that the annual rate of growth of real wages averaged between 4.0 and 4.5 percent in the modern sectors of the

nonagricultural economy while the corresponding rate for the traditional sectors (in agriculture and nonagriculture) was probably zero over the period 1951-64. In Ceylon, it was estimated by ILO that as many as 60 percent of the rural households had inadequate incomes--in the sense that they were at or below the poverty line.

Even allowing for the inadequacy of the data and scarcity of reliable empirical studies, it can no longer be doubted that the magnitude of un- and underemployment has increased in most of the countries under consideration and that the fruits of economic growth tend to be more unevenly shared than in the past. There are a number of factors which have contributed to the rise in unemployment and the tendency towards a more unequal income distribution in developing countries. An attempt is made here to identify these factors--and their relative importance--for the countries under consideration. As a first step, some of the major relevant performance indices and national characteristics are brought out before developing a possible typology.

Table 1 provides a series of key indicators for the selected countries. It can be seen that in each case--leaving aside the developed countries, Hungary and Japan--the growth rate of population in the sixties was very high, ranging between 2.4 percent and 3.3 percent annually. [4/] Furthermore, each of these countries underwent a pronounced acceleration in the growth of its population and labor force during the last two decades. The population explosion--through its effect on the size of the labor force--is clearly a major cause of the increasing seriousness of the unemployment problem in the developing world. In terms of total population, five of the

[4/] Hungary's population remained almost stationary during the sixties.

Table 1. Key Indicators for Selected Countries

Country	Growth Rate GDP Per Capita 1959-1969 (annual)	GDP Per Capita[2/] in US Dollars 1969	Total Population in Millions 1969	Growth Rate of Population 1959-1968 (annual)
1. Ceylon	1.7	190	12.0	2.5
2. Pakistan and Bangladesh of which	2.8	110	125.0	2.6
3. Bangladesh		(90)	(73.0)	
4. Pakistan		(145)	(52.0)	
5. Japan	10.0	1.430	100.0	1.1 (1885-1919) 1.3 (1919-1954)
6. Morocco	3.4 [1/]	190	14.6	2.8
7. Ivory Coast	4.7	240	4.9	2.8
8. Egypt	2.3	160	31.7	2.6
9. Colombia	1.5	290	19.8	3.3
10. Indonesia	0.8	100	117.0	2.4
11. Guatemala	1.8	350	4.8	3.1
12. Hungary	5.5	1,100	10.2	0.3

[1/] The OECD National Accounts in Developing Countries (1970) indicates that GDP per capita grew at .9 annually between 1959-61 and 1966-68. There was a very sharp acceleration of GDP in 1968-69 which together with the choice of years (1959-69) may account for the much higher figure for per capita GDP growth given by the World Bank (3.4).

[2/] Source: World Bank.

Table 1. Continued

	Share Agriculture in GDP Late Sixties (%)	Share of Agriculture in Labor Force Late Sixties (%)	Unemployment in Labor Force [3/] Late Sixties (%)	Share of Agricultural Unemployment Out of Total Unemployment Late Sixties (%)	Import Ratio (%)
1.	37.0	50.0	13	40	23
2.	46.0	71.0	19	93	9
3.	(55.0)	(84.0)	(29)	(96)	
4.	(37.0)	(53.0)	(6)	(77)	
5.	60.0 (1885) 12.0 (1967)	80.0 (1885) 24.0 (1967)			10
6.	35.0	72.0	20 [4/]		22
7.	34.0	75.0			29
8.	26.0	49.0	9	56	21
9.	31.0	47.0	18		11
10.	52.0	70.0	26	90	
11.	30.0	65.0	30	92	18
12.	15.0	26.0			

[3/] The quality of unemployment information is notoriously weak. The figures contained in this column come from national sources (given in the text of the country studies). They are meant to reflect approximately the seriousness of the unemployment problem. The percentages are, however, not strictly speaking comparable since national definition of unemployment vary. In some cases only voluntary unemployment is given, while in others unemployment equivalent shares are given which include an estimate of underemployment.

[4/] Unemployment in urban areas only.

countries under consideration can be thought of as small with population under 15 million in 1969, i.e., Guatemala, Ceylon, Ivory Coast, Moroco, and Hungary; two countries are of medium size, i.e., Colombia (20 million) and Egypt (32 million). Pakistan and Bangladesh with a combined population of about 125 million, Japan (100 million) and Indonesia (115 million) are the only large nations from a population standpoint. The per capita GDP of the developing countries in the sample varied between 100 U.S. dollars (i.e., Indonesia) and 350 U.S. dollars (i.e., Guatemala) in 1969.

Their performance in the sixties with respect to the growth of per capita GDP varied. Indonesia's economy remained almost stagnant. Three countries, namely, Colombia, Guatemala and Ceylon, performed moderately well with annual growth rates between 1.5 and 2.0 percent; two did well, i.e., Egypt (2.3 percent) and Pakistan and Bangladesh combined (2.8 percent), while the corresponding growth rates of Japan (10.0 percent), Hungary and the Ivory Coast were exceptionally good. The performance of Morocco was mixed. Very large yearly fluctuations in per capita GDP growth took place after 1966. 5/

The strong dependence on imports is reflected by the last column of Table 1. The import ratio, i.e., the share of imports in GDP, was above 18 percent in five countries and around 10 percent in Pakistan and Colombia

Both the shares of agricultural value added to GDP and of agricultural labor force to the total labor force were relatively high in the selected countries. The former share ranged between 25 and 30 percent in Egypt, and Guatemala and was between 31 and 40 percent in all other countries

5/ Thus, average per capita GDP growth is highly sensitive to the choice of base and terminal years. For instance, the annual growth rate of per capita GDP amounts to only .9 percent between 1959-61 and 1966-68, while the corresponding rate becomes 3.4 percent if the period 1959-1969 is selected. (see footnote 1 to Table 1).

except for Pakistan and Indonesia where it amounted to 46 and 52 percent, respectively, in the late sixties. In Hungary this share dropped from 37 percent in 1950 to about 15 percent in 1969, while in Japan the corresponding decline was from 60 to 12 percent between 1885 and 1967. With regard to the latter share--the proportion of the labor force in agriculture--two groups of countries can be distinguished, i.e., a first group where this share ranged between 40 and 50 percent (Colombia, Egypt, and Ceylon) and a second group where this same share varied between 65 and 75 percent (Guatemala, Indonesia, Pakistan, Morocco, and Ivory Coast). It is not surprising to note that Bangladesh--the poorest country in the sample--also has the highest shares of agricultural GDP to GDP (55 percent) and of agricultural labor force to total labor force (84 percent). 6/

Two other indicators which appear in Table 1 are estimates of the magnitude of unemployment relative to the labor force and the proportion of unemployment in agriculture to total unemployment. As was pointed out previously, these estimates are not strictly speaking comparable since they are based on different definitions of unemployment. A number of these estimates attempt to measure both unemployment and underemployment (e.g., the number of labor hours or days available in the labor force in excess of the number of labor hours or days of actual work). This unemployment equivalent concept is, of course, subject to a variety of methodological criticisms. Clearly, it cannot be assumed that the supply of labor is infinitely inelastic to the wage rate. At the same time the unemployment equivalent concept may approximate the number of man-days (or man-hours) which would be forthcoming at the prevailing wage rate if

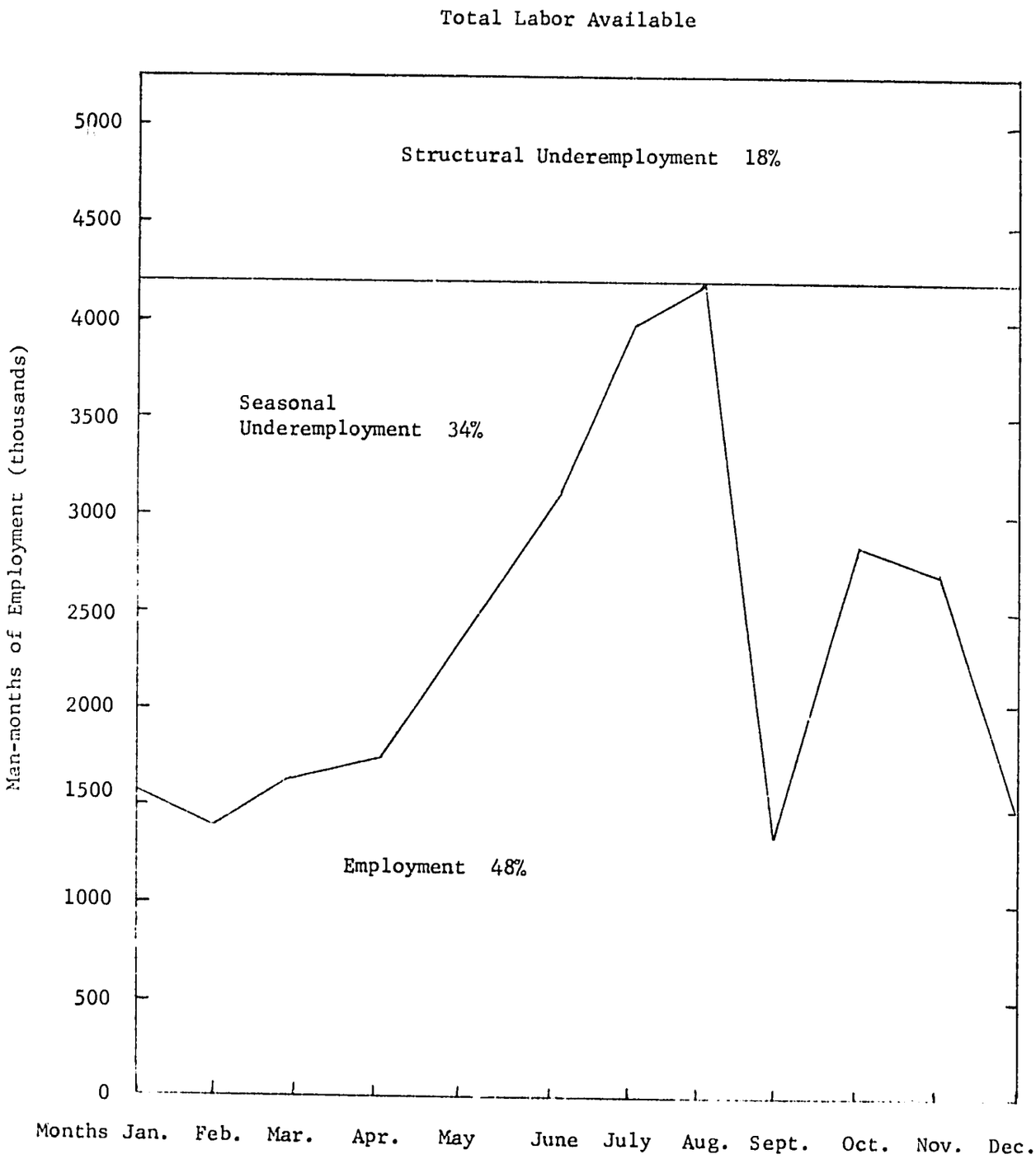
6/ Here again it is interesting to observe that the proportion of the labor force in agriculture in Japan in the Meiji period (1885) was even higher than in most presently developing countries amounting as it did to 80 percent.

the actual demand for labor was large enough to absorb this excess labor. In any case, the excess of available labor days in the labor force over labor days required to produce the output represents a pool of potentially employable labor resources. In a very meaningful sense, this unutilized manpower represents a foregone opportunity to earn income and thereby improve the standards of living of millions of individuals who are operating at the subsistence level.

The figures in columns 7 and 8 of Table 1 reflect in a very approximate and suggestive way the magnitude of un- and underemployment in the countries under scrutiny and the fact that a large part of the unutilized labor resources is in the agricultural sector. The main form which agricultural underemployment takes is seasonal as opposed to structural. In other words, given the seasonal characteristics of production and the consequent substantial differences in monthly labor requirements, the peak labor requirements (say at harvest time) tend to be substantially higher than during off-peak periods. On the other hand, there is little evidence that structural underemployment, or labor-surplus, exists more than marginally, in the sense that the size of the permanent labor force exceeds the labor requirements during the peak production period. Detailed empirical studies conducted in Guatemala, Peru, and Egypt, and estimates, with respect to Mexico, the extent of structural and seasonal underemployment in short-cycle crops in 1968. It can be seen that it was estimated that 52 percent of the total labor resources available were underemployed - structural underemployment amounting to 18 percent and seasonal underemployment to 34 percent. 7/

7/ The above estimate that approximately half of the total labor resources were not productively used is of the same general order of magnitude of that found in a number of countries (e.g., Peru, Guatemala). On the other hand, the extent of structural underemployment (18 percent) appears much higher than in most other country studies.

Figure 1. Mexico: CHAC Model Estimate of Seasonal in Underemployment in Shortcycle Crops (1968)



Source: L. Goreux and A. Manne, Multilevel Planning in Mexico, (North Holland Publishing Co., 1972).

In a general sense, it can be stated that overt unemployment can be found mostly in the urban areas and usually affects the younger age group (particularly between the ages of 15 and 24) with some secondary or even higher education. Ceylon is a prime example of this situation as 57 percent of the above group was reported to be unemployed. Underemployment, or partial employment, affects primarily the agricultural sector, where it takes the form of seasonal underemployment, and the traditional service subsector in the cities. There is strong reason to believe that services tend to be a residual outlet in the metropolitan areas to absorb (one is tempted to say "mop up") many individuals who would otherwise be unemployed. In this last sense, one can think of the traditional service subsector as fulfilling the same function in an urban context as the traditional agricultural subsector performs in rural areas. At the same time there is some evidence that notwithstanding its low productivity and relatively large underutilization - employment in the so-called informal sector may play an important role in the development process. This is, at least, the conclusion which is reached by the recent ILO employment mission to Kenya.

B. A Typology of Agricultural Development Performance and Strategy

The next step, after having reviewed the prevailing situation regarding unemployment, income distirbution and other key indicators, consists of deriving a typology reflecting the different kinds of development experiences and strategies (particularly with respect to agriculture) found among developing countries.

By evaluating the performance of and constraints faced by our set of countries according to a variety of criteria, certain common characteristics for different subsets are discernible which suggest a possible

typology. Table 2 evaluates the countries performance and characteristics with respect to the following criteria:

(1) Growth of per capita GDP;

(2) Skills constraint

(3) Balance of payments
  (a) Foreign aid inflow
  (b) Export performance
  (c) Import substitution

(4) Land ownership and income distribution
  (a) Land ownership and distribution
  (b) Land reform
  (c) Degree of dualism in agriculture
  (d) Income distribution

(5) Agricultural production and institutions
  (a) Land constraint
  (b) Importance of new agricultural, labor-intensive techniques
  (c) Cropping pattern, irrigation
  (d) Rural institutions
  (e) Rural works programs

(6) Migration
  (a) Rural-urban migration
  (b) Intra-rural, seasonal migration
  (c) Emigration

In addition Table 3 shows the difference prevailing between the countries in our sample with respect to a number of agricultural indicators.

The following types of development strategy suggest themselves on the basis of these criteria and indicators:

(1) Unimodal agricultural strategy
  (a) outward-looking
  (b) inward-looking

(2) Bimodal agricultural strategy
  (a) outward-looking
  (b) inward-looking

(3) Industrialization--first strategy (e.g., strong preference for industrial development as against agricultural development

Table 2. Selected Countries Performance During the 1960's According to Various Criteria

Criteria / Country	Growth of Per Capita GDP	Skills Constraint	Balance of Payments		
			Foreign Aid Inflow	Export Performance 1/	Import Substitution
1. Ceylon	moderate	adequate supply	relatively high	weak	strong and inefficient
2. Pakistan	mixed	strong	average	mixed	strong and inefficient
3. of which Pakistan (present)	high	relatively strong	relatively high		
4. Bangla-desh	low	very strong	low		
5. Japan	very high	adequate supply	very low initially	excellent	efficient
6. Morocco	mixed, strong in late 60's	very strong	mixed	weak	relatively strong
7. Egypt	good	strong	average	average	relatively strong
8. Colombia	moderate	relatively strong	relatively high	average	relatively strong
9. Indonesia	low	strong	low	average	average inefficient
10. Ivory Coast	very high	very strong	moderate	relatively strong cocoa)	moderate, inefficient
11. Guatemala	moderate	strong	relatively high	average	relatively integration CACM
12. Hungary	high	inter-mediate	low		

1/ Growth of Exports and Exports diversification.

Table 2. Continued

Land and Income Distribution				Agricultural Production and New Agriculture		
Land Distribution	Land Reform	Dual Agriculture[2/]	Income Distribution	Land Constraint	Labor Intensive Techniques	Cropping Pattern, Irrigation
1. relatively uneven	Yes	Yes	relatively uneven	binding	starting	inflexible
2. mixed	Yes		relatively uneven			
3. relatively uneven		some degree	relatively uneven	relatively strong	Green Rev.	multiple cropping
4. relatively even				binding	starting	irrigation problem
5. very even	Major	No	relatively even	binding	strong	flexible, multiple cropping
6. relatively uneven	Yes	some degree	relatively uneven	strong	starting	inflexible, irrigation problem
7. relatively uneven	Yes	New land/ Old land	relatively even	relatively strong	starting	inflexible, irrigation problem
8. very uneven	No	strong between export crops & domestic crops	very uneven	average	modest	relatively flexible
9. relatively uneven	weak	strong	very uneven	binding in Java,Madura	starting	inflexible
10. uneven	weak	strong	very uneven	moderate	starting	weak, inflexible
11. very uneven	No	same as Colombia	very uneven	average	modest	relatively inflexible
12. Collective State forum	Yes Collectivization	Some degree	relatively even	modest	modest	relatively inflexible, centrally planned

[2/] Existence of a commercial modern sector side by side with a traditional subsistence sector. Often the modern sector is also the export sector.

Table 2. Continued

	Rural Institutions	Rural Works Program	Migration: Rural-Urban	Migration: Intra-Rural, Seasonal	Migration: Abroad
1.	average		weak, welfare scheme in rural areas	modest	
2.					
3.	starting	fairly important	relatively large	fairly large	
4.	weak	important	large		
5.	very strong	industrial dualism	weak in early stage, then large with productive absorption	small	none
6.	modest	important	large		relatively large
7.	modest		weak		
8.	average		large		
9.	weak	weak	weak	modest	none
10.	weak	weak	strong	fairly large	large immigration
11.	weak		large	very large	
12.	average	industrial dispersion to rural areas	tendency for young people to leave agriculture	some	none

Table 3. Selected Agricultural Indicators 1960-70.

Country	Land Tractor (A/T)		Fertilizer Consumption-Land Ratio (F/A)	
	1960	1970	1960	1970
	(Hectares per tractor)		(Kg/hc)	
1. Ceylon	420	247	39	47
2. Pakistan and Bangladesh	4,224	2,578	4	15
3. of which Pakistan (present)				
4. Bangladesh				
5. Indonesia	21,828	2,118	2	14
6. Japan				
7. Morocco	611	500	4	12
8. Ivory Coast	80,000	7,232	1	3
9. Egypt	222	178	87	122
10. Colombia	215	189	1.2	34
11. Guatemala	818	476	10	31
12. Hungary	141	82	25	148

Source: FAO Statistics Division, Summer 1972.

Table 3. Continued

	Land-Ag. Labor Ratio (A/L)		Cropping-Intensity Indicators (Am/A)		Irrigated Land Total Land Ratio (Ai/A)		Ag. Exports Total Exports Ratio (Ea/E)	
	1960	1970	1960	1970	1960	1970	1960	1969
	(ha/man)		(%)		(%)		(%)	
1.	.83	.93	36	38	24	20	97	95 1/
2.	1.04	.99	83	82	42	42	75 2/	56
3.	1.50	1.49						
4.	.67	.59						
5.		.63		63	21	38	66	
6.								
7.	4.10	3.13	46	57	1	3	71 2/	59
8.		4.75		9	.1	.2	97	50
9.	.58	.57	82	96	100	100	81	69
10.	2.08	1.89	39		4		79	75
11.		1.53		45	2	4	92 2/	75 1/
12.	2.99	4.30			2	2	25 2/	24

Source: FAO Statistics Division, Summer 1972.

1/ 1968

2/ 1962

Table 3. Continued

	Migration			
	Annual Rate of Migration as % of Agriculture Population		Annual Rate of Migration as % of the Non-Agriculture Population	
	1960-65	1965-70	1960-65	1965-70
1.	0.47	0.67	0.57	0.77
2.	0.77	0.56	2.52	1.61
3.				
4.				
5.	0.61	0.27	1.71	0.68
6.				
7.	0.34	0.46	0.58	0.73
8.	2.27	1.95	10.05	5.61
9.	0.42	0.41	0.56	0.52
10.	1.29	1.24	1.29	1.09
11.	0.51	0.83	0.96	1.40
12.	5.49	4.74	2.95	1.77

Source: FAO Statistics Division, Summer 1972.

(4) Socialization and collectivization strategy

The distinction between unimodal and bimodal strategies in agriculture has been very clearly drawn by Bruce Johnston. [8/] The present typology goes further by adding two additional types of strategy ("industrialization-first" and "socialization" and by distinguishing according to whether the strategy is inward- or outward-oriented).

Each of these types is described below and illustrated by appropriate country examples.

(1) Unimodal Agricultural Strategy

The essence of this type of development is that it is based on what Marsden has called progressive modernization of agriculture from the "bottom up." In contrast with the bimodal strategy which encourages the growth of a modern commercial, large-scale relatively capital-intensive subsector side-by-side with a traditional subsistence subsector, the unimodal approach relies on the widespread application of labor-intensive technology to the whole of agriculture. Through a combination of agricultural research, land redistribution, the provision of agricultural infrastructure, the growth of rural institutions and other measures, agricultural development is spread relatively evenly over the mass of the people. This unimodal strategy can be either outward-looking or inward-looking.

(a) Outward-Looking Approach

Japan is an outstanding example of a nation which followed a unimodal, outward-looking strategy throughout its modern history. It is

[8/] See Bruce F. Johnston, "Criteria for the Design of Agricultural Development Strategies," Food Research Institute Studies, Vol. X1972. After defining and describing the major characteristics of these two strategies and evaluating their effects on various development objectives, Johnston opts strongly in favor of the unimodal strategy.

essential in order to study Japan's economic development performance and particularly that of employment, to go back at least to the beginning of the Meiji Restoration (1868) which marked the beginning of the modern state of Japan. A consensus seems to have emerged that Japan's outstanding economic development performance was not accidental, but rather the result of the choice of appropriate policies. Of greatest relevance from the standpoint of presently developing countries is the first phase of Japanese agricultural transformation which embraced the period from about 1868 until the First World War. During this period the share of Japan's labor force in agriculture declined from about 80 percent to 55 percent while the share of agricultural output in total output declined from 60 to 42 percent. In a nutshell, the adopted technology was extremely labor and land-intensive with minimal requirements for capital. In fact, while agricultural productivity and output continued to grow rapidly, the average farm size remained constant at about one hectare.

This remarkable increase in agricultural productivity and output was made possible by the evolution and spread of technology of a biological and chemical nature (e.g., fertilizers, and high yielding varieties), improved cultural practices and implements, and institutional reforms which strengthened the rights and privileges of tenants vis-a-vis landlords and the establishment of financial intermediaries which increased greatly the supply of agricultural credit and of co-operatives. Finally, a modern system of education was initiated which provided among others technical education in agriculture. Thus, this rise in productivity resulted from a combination of advances in agricultural sciences and the establishment of a network of rural institutions which facilitated the adoption and infusion of modern inputs. Another important characteristic of this

phase was that agricultural and industrial development went forward in a process of balanced or concurrent growth.

In addition to the strong emphasis on a labor-intensive and equitable development strategy, Japan followed an outward-looking set of trade policies. As an earner of foreign exchange, agriculture played a key role during this first phase of Japan's modern economic growth. The contribution of agiruclture to export earnings (mainly tea and raw silk) amounted to close to 70 percent.

What makes the case of Japan so interesting is that it followed consistently the same agricultural development strategy, at least over the last hundred years. Even in the post-World War II phase, agricultural output and productivity have continued to increase sharply within the existing small-scale farming system through the intensive use of labor and land with remarkably small demands on the scarce capital and foreign exchange resources.

It is clear that the approach followed by Japan has been very successful from a developmental standpoint. The growth rate of per capita GDP has become one of the highest in the world after a very long period of sustained and continuous growth--except for the depression period of the 30's and the war period of the 40's. The extent of employment and underemployment remained small and the migration from rural agricultural to rural small-scale industries and services and to the urban centres could be productively absorbed (was at a rate such that it could be productively absorbed). Throughtout this period, the tendency was for the distribution of income to become more even and for the balance of payments to remain strong except for the so-called "retardation phase" between the two world wars. It is, of course, very difficult to determine closely the extent

to which this strategy might be transferable to at least some of the presently developing countries. In any case, it can be stated that the unimodal outward-looking strategy worked exceedingly well in Japan.

(b) Inward-looking approach:

It is rather difficult to find good examples of this type. To some extent, it can be argued that Bangladesh, before the partition, fitted this category. The land was fairly evenly distributed with no evicence of dualism in agriculture. At the same time, the policies followed by the federal government were strongly portectionistic. As is discussed subsequently in detail with regard to Pakistan, the emphasis which the Pakistan government placed on industrial rather than agricultural development led to the implementation of a whole set of measures which tended to foster import substitution. It has been convincingly shown that this import substitution process resulted in the creation of highly inefficient industries.

In any case, this inward-looking approach resulted in serious price distortions. The maintenance of an overvalued exchange rate and other subsidies on capital discouraged exports and encouraged imports--and more specifically capital imports. Consequently, the extent of mechanization was much greater in agriculture than was consistent with the resource endowment. Tractors, which were artificially cheap, were replacing human and bullock labor which was artificially expensive. Although this process was more accentuated in the western wing, the East suffered from it as well. The extremely large level of un- and underemployment which is recorded in the latter was undoubtedly greatly influenced by these price distortions.

The Green Revolution has not yet had a marked effect on Bangladesh. A major constraint to increased agricultural output in that region is the land-man ratio and the lack of irrigation. Large-scale irrigation and flood control projects will be required before high yielding varieties can be adopted.

One very interesting and successful methos which was used to reduce rural unemployment, and particularly seasonal underemployment, consisted of the rural works programs. It was estimated that these programs reduced underemployment by as much as 5 percent while completing various projects such as drainage canals, rural roads and schools at comparatively low costs. The indirect effect of these programs on rural wages narrowed somewhat the rural-urban wage differential and might have had some impact on reducing the rural-urban migration which remains, nevertheless, dangerously high.

(2) The Bimodal (Dual) Strategy

The bimodal strategy is based on encouraging the development of a commercial, modern, relatively capital-intensive, subsector which provides the bulk of agricultural output to satisfy export demand and domestic commercial demand for food and other agricultural products. The remainder of agriculture would be confined to a traditional subsistence subsector, which would have practically no claim on public resources. Often, this type of dual agriculture evolved historically as a heritage of the colonial period. In other cases, it was actively promoted mainly on output grounds, i.e., the potential or actual undesirable effects of such a strategy on employment and income distribution were ignored or, at least, weighed lightly in comparison to the output goal in the preference function. Again, two variants of this type can be distinguished depending on

whether it was outward- or inward-looking.

(a) Outward-looking approach

The Ivory Coast appears to fit this category. A pronounced dualism exists in agriculture between the Northern traditional subsistence subsector and the modern, commercial export-oriented subsector in the South. To a large extent, this dualism is influenced by the ecological differences between the two regions. There is strong evidence that the income distribution has become more uneven. Even though the bulk of the agricultural labor force is in the North, it is in the Southern commercial subsector that most of the agricultural output originates. Unemployment as such is not a serious problem. If anything, the tremendous magnitude of the rural-urban migration has created at times an accute seasonal shortage of agricultural manpower which has led to a relatively large-scale immigration of unskilled labor from neighboring countries. In fact, the Ivory Coast is in the very unusual situation for a developing country of having relatively very few natives at either end of the hierarchy of skills. At the top, i.e. among highly qualified technicians and administration personnel less than 15 percent were Ivory Coast nationals and at the lower end, among the lowest paid unskilled workers only 30 percent of the jobs were held by Ivorians.

The Ivory Coast has followed an outward-looking policy with respect to trade and investment. Exports have been increasing very rapidly reaching a level of 37 percent of GNP in 1968, while the corresponding import share was 29 percent.

Perhaps an even better prototype example of this category is offered by the case of Mexico. Mexico's agricultural development has been strongly dual particularly since the Second World War. As a rough approximation,

it has been estimated that the modern, commercial, strongly export-oriented subsector contributed about 80 percent of the total output while employing only 20 percent of the agricultural labor force. On the other hand, the traditional subsector--largely contained in the "ejidos" communities--contributed only about 20 percent of the output while "employing" 80 percent of the agricultural labor force. This dualism was strongly encouraged by the Mexican government.

In a number of respects this approach was successful. The rate of growth of agricultural output was high by international standards, yields in the modern subsector increased very substantially under the impact of mechanization and the large-scale adoption of high-yielding varieties. Furthermore, modern agriculture was a major contirbutor to export earnings. The main drawback of this strategy was that it left unaffected the bulk of the subsistence farmers.

In addition to the conscious promotion of dualism within agriculture, the Mexican development process was strongly outward-looking. The commercial policies which were followed tended to be liberal. The export performance was good and the import-substitution process tended to be efficient. In other words, new domestic industries were relatively competitive in world markets. The existence of a large domestic market was clearly an advantage. Brazil is perhaps still another example of a country which followed the same type of strategy.

(b) Inward-looking approach:

Colombia appears to fit this category relatively well as can be ascertained by looking at various criteria in Table 2. The distribution of land is extremely uneven, e.g., 1.2 percent of the population owns 45 percent of the cultivated and pasture land, while, at the other end of the

spectrum, 65 percent of the population owns only 5.5 percent of the land. The agricultural sector is strongly dualistic--a modern, high income export-oriented subsector coexists with a subsistence subsector. Farm mechanization in the modern part appears quite extensive, close to the level found in labor-scarce, land-rich countries.

The major distinction between the Colombian case and that of Mexico is the approach with respect to international trade. The balance-of-payments has continued to be a binding constraint. The consequences of exchange and direct controls and other commercial policies were to foster an inefficient set of industries and to help create serious price distortions. Indeed, a continued overvalued exchange rate combined with various tax incentives tended to keep the price of capital below its equilibrium price, while minimum wage legislation and various employers charges tended to make the price of labor higher than its marginal contribution to output. The combined effect of these artificial price distortions was to encourage the adoption of capital-intensive, labor-saving techniques. This explains the prevalence of tractors and other mechanical farm implements in the midst of serious and growing unemployment and underemployment.

The mechanization trend in the modern agricultural subsector has accelerated the already rapid rural-urban migration. The output growth of the nonagircultural sector has been impeded by a number of factors. The very uneven income distribution limited the size of effective demand and further accentuated the disadvantage of a relatively small domestic market. Inefficient import-substitution and price distortions encouraged the adoption of relatively capital-intensive techniques outside agriculture as well. Consequently, the labor absorption capacity of the modern urban sector has remained quite low. The new entrants in the urban labor

force have a very difficult time finding productive employment and many of them end up in the traditional service subsector (e.g., as shoe-shiners, street vendors, part-time gardeners or personal service) where underemployment is endemic. A large number of the young with secondary level education join the rank and file of the openly unemployed.

A number of other Latin American countries appear to fit the development pattern described above. Most of the Andean Zone countries, to a greater or lesser extent, display a considerable degree of dualism and restrictive trade and exchange policies. Central America, as well, conforms to this general pattern as the case study in Part II, Section I indicates. Most of the characteristics which have been described briefly above for Colombia apply to Central America as well and will therefore not be repeated in this synthesis. It is sufficient to point out that land ownership is extremely uneven. The modern subsector is export-oriented (e.g., coffee, cotton, sugar)--with two-thirds of the exports originating in agriculture--and consists of relatively large holdings, whereas the subsistence sector is made up of a multitude of extremely small farm units. One source estimated that 77 percent of the farms in Central America were subfamily farms in the sense that the net output of these farms was not even sufficient to provide a subsistence income to a family. Out of a total labor force of 4.2 million more than one million individuals are landless laborers. The magnitude of underemployment is very high and the real output per capita declined in the Guatemalan Altiplano (the subsistence sector) between the early fifties and late sixties. A very large seasonal migration occurs in Guatemala from the Altiplano to the large coffee and sugar estates. This migration is possible because of the different production calendars in the subsistence

Highlands compared with the modern Lowland subsector.

The trade policy of Central America is also inward-looking. Within the Central American Common Market (CACM) many commodities could move freely anduntil 1969 the growth of intra-trade within Central America was much faster than external trade. At the same time the domestic markets of the member countries are heavily protected from the rest of the world for a whole set of goods. Economic integration within the CACM was an attempt at expanding miniature national markets behind a protective wall.

There appears little doubt that the dual, inward-looking strategy followed by Colombia, Central America and other Latin American countries has worsened the unemployment problem and increased the inequality in the income distribution. In at least some of these countries, there is an increasing awareness that drastic structural changes are necessary such as land reforms, the removal of price distortions and other measures which would encourage the adoption of more labor-intensive techniques. It is relevant to note that in a number of the countries studied it appears that a greater emphasis on the traditional sector, and in a more general sense on intermediate techniques in agriculture would be consistent with the highest growth of both output and employment. Thus, in countries such as Colombia, Guatemala and Peru there need not be a conflict between the output and the employment objectives, at least within agriculture.

Ceylon is another example of an economy which is characterized by a dual agriculture (i.e., export plantations side by side with a subsistence sector producing domestic crops such as rice) and by restrictive trade policies. The balance-of-payments is the major constraint to growth as is reflected by the fact that its deficit in 1968-70 amounted to nearly 10 percent of total output. The emphasis on industrialization and import

substitution has created a capital-intensive, labor-displacing bias inconsistent with Ceylon's resource endowment. Furthermore, the distribution of land is uneven. Given the magnitude of unemployment problem, a land reform combined with the adoption of more labor-intensive technology and a more labor-intensive output mix in agriculture has been suggested by the ILO mission. Here again the removal of price distortions appears essential.

Finally, three other countries in the FAO sample, i.e., Morocco, Egypt, and Indonesia appear to belong to this category--although perhaps not quite as clearly as the other countries just reviewed above. The agricultural dualism in Morocco started during the Colonial period. French settlers occupied and cultivated large estates which produced for the export market. After independence the new state took over the cultivation of these lands thus maintaining the prevailing dualism. In Egypt, by contrast, it appears that the division is between the so-called Old Land and New Land. The Old Land is the tradtitional subsector, whereas the New Land consists of newly reclaimed and irrigated land. It seems that the government is encouraging the adoption of modern capital-intensive techniques on the New Land, while taking an essentially passive attitude vis-a-vis the traditional subsector. The case studies show that Morocco and Egypt display many of the same features with respect to such factors as industrialization, import substitution and migration as those described previously.

Indonesia displays strong dualistic characteristics within agriculture, first as between the traditional food crop subsector and the commercial sector and, secondly, within the latter as between production by smallholders and by plantations. Even though Indonesia is still largely

dependent on agricultural exports for the bulk of its foreign exchange earnings, it is clear that its trade and monetary policies in the sixties have acted as a strong deterrent to international trade and in this sense was inward-looking.

(3) Industrialization-First Strategy

This strategy is based on the belief that industrialization is the key to development and that the industrial sector, as the advanced sector, would pull with it the backward agricultural sector. More specifically, industry, as the leading sector, would offer alternative employment opportunities to the agricultural population, would provide a growing demand for foodstuffs and agricultural raw materials and would begin to supply industrial inputs to agriculture. The industrial sector was equated with high productivity of investment--in contrast with agriculture--and, therefore, the bulk of investment was to be directed to industrial development. The role assigned to the industrial sector was that of the leading active sector, while agriculture would follow passively.

This prescription for development was widely subscribed to in the forties and fifties and it is only fairly recently that it has become clearly understood that the roles which both sectors have to perform in the development process are totally interdependent.

Pakistan and India appear to be representative examples of many countries which followed this approach until the early sixties. Pakistan attached a primary importance to industrialization and embarked early on a massive import-substitution policy encouraged by a restrictive licensing system and artificial pricing policies. A number of highly inefficient industries were fostered which in some cases revealed negative value added when both outputs and inputs were computed at world prices. The degree

of capital-intensity in Pakistan and India in a number of industrial branches was as high as in the U.S.A. and in most cases higher than in Japan.

The agricultural sector was strongly discriminated against through a number of measures such as turning the internal terms of trade against agriculture, allocating only a small share of public resource to it, and not encouraging the development of rural institutions. In addition, both India and Pakistan continued to rely very heavily on food aid--mainly under U.S. PL 480. To some extent, the availability of this aid helped maintain low relative agricultural prices which discouraged domestic production and made it possible for these governments to continue to de-emphasize the need for greater domestic agriculture.

In the middle sixties a thorough change in strategy took place. The interdependence of these sectors was increasingly recognized and the need for a more balanced growth accepted. This coincided with a revision of the United States food aid policy to emphasize self-help in agriculture as a condition for obtaining food aid, and with the availability of the new technology based on high yielding varieties and intermediate inputs. The very success of the Green Revolution is attributed to the fact that all components required for the take-off were present.

The impact of the new technologies is a question of crucial importance. On the one hand, the new technologies increase the labor requirements per acre because of the additional labor activities to be performed (such as applying fertilizer) and because of multiple cropping. On the other hand, the tremendous yield increases which result tend to reduce labor requirements per unit of output. The net effect on employment depends, therefore, on whether the relative increase in agricultural output is larger than the

relative fall in labor requirements per unit of output. Even though the evidence presently available is limited, it does appear that the net indirect effects of the Green Revolution on employment will be positive, at least up to the point where production equals effective domestic and export demand. In other words, the more a country was dependent on food imports the greater the scope for import substitution and a discrete jump in food production which can be marketed (i.e. for which there is an effective demand).

In addition, a set of indirect employment effects may be triggered by new techniques in the service and marketing sectors of the economy and in the industries providing inputs such as fertilizer. The Green Revolution is likely, initially, at least, to increase the level of productive employment in agriculture and thereby slow down the rural-urban population migration so typical of the developing world. This would alleviate some of the political, social, and economic problems resulting from these migrations. It seems essential that the type of mechanization which tends to substitute capital for labor be discouraged as much as possible if the beneficial effects of the Green Revolution on employment are not to be undone. The effect of new technologies on income distribution will depend on the socially and politically determined division of benefits, not on the Revolution _per se_. To the extent that relatively small farm owners adopt new techniques, it should lead to a more equal income distribution. But income distribution will become less equitable if most of the benefits accrue to large landlords. The present limited evidence seems to indicate that large farmers are benefiting most because of easier access to credit and greater managerial ability.

(4) Socialization and Collectivization of Agriculture

The socialization of agriculture which usually takes the form of collective or cooperative farms presents a fourth distinctive type of approach to agricultural development. Even though the latter approach takes a variety of different forms, there appear to be certain common characteristics which distinguish to socialization strategy from others. These major characteristics are:

(a) the elimination of individual land ownership;

(b) The consolidation of land holdings and other resources into "communes," collectives, or cooperatives which are run jointly and where the net benefits are shared among the members;

(c) the undertaking within this form of organization, in addition to farm activities *per se*, of non-farm (rural) activities which complement the former.

It is perhaps useful to review some of these characteristics more specifically with reference to Hungary, the only representative of this prototype in the FAO sample.

Hungary underwent a major land reform in 1945 which led to the socialization of the agricultural sector, i.e. 96 percent of the total land area was in cooperative farms by 1960. The "socialist transformation" of agriculture brought with it a new approach vis-a-vis the problem of employment. The establishment of cooperative and state farms shifted a large part of the (employment) adjustment burden onto the cooperatives themselves. At the outset, the situation was a difficult one since on the one hand "the industrialization of agirculture" was a politically desirable objective, and on the other hand, it was clear that people had to be retained in the rural areas so as not to overburden the absorptive capacity of industry and other sectors in the urban areas. The mechanization process proceeded

rapidly as evidenced by the increase in the number of tractors from 15,000 units in 1952 to 140,000 units in 1969.

One of the more interesting aspects of the cooperative farming scheme in Hungary was the approach to seasonal underemployment in agriculture. To overcome this problem the state farms were allowed to engage in activities outside agriculture which could be undertaken in a seasonally complementary way to the agricultural activities. As was pointed out in the Hungarian case study, these activities took the form of participation in the building trade, processing of agricultural products, the establishment of retail sales outlets, and even the tendency for large farmers' cooperatives to engage in direct manufacturing activities.

On state farms, wage differentials tend to be kept within very narrow limits. However, on cooperative farms the main income source of members is through an "income-sharing system" based on standard work days. In addition, the members' earnings come from their private plots and the small-scale livestock enterprises which they carry on. These activities tend to be very labor-intensive and thus are more important in those cooperatives where the efficiency of the common operations is low and where the scope for economies of scale is limited. What appears fascinating about this system is the prevalence of "bimodalism" at the micro level i.e. at a level of the cooperative. In some respect, a similar type of situation might be found on large commercial plantations in developing countries. The difference between the latter and the above type of cooperative farm is, of course, that the technological differences between the modern and traditional production alternatives are likely to be greater in the socialist farm as well as the share of the benefits accruing to the workers, members of the cooperatives.

Conclusion

Four types of agricultural development strategies have been identified and illustrated with the help of appropriate examples drawn from the country case studies. These strategies are: (a) the unimodal strategy; (b) the bimodal strategy; (c) the "industrialization-first" strategy; and, finally (d) the socialization and collectivization of agriculture. [9/]

It is clear that the choice of an agricultural development strategy depends on the major policy objectives of a government and of the prevailing initial conditions. At the same time, the comparative survey undertaken in this study provides a strong justification for following a unimodal strategy, particularly in cases where a relatively high weight is placed by policy-makers on the objectives of employment and a more equitable distribution of income. Alternatively, there appear to be strong disadvantages from a long-run development standpoint, in general, in following a "bimodal" or "industrialization-first" strategy.

[9/] It should be noted that these strategies are not completely mutually exclusive.