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Prospects for Food Production and Consumption in Developing Countries

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Abstract

This Paper analyzes recent trends in world food production and consumption with special reference to developing countries. It continues by outlining the World Bank's approach to projections of food production and consumption providing results to the year 1995. It is shown that levels of consumption of various food items have improved in developing countries and are expected to continue to improve. Moreover, the results indicate favorable prospects for food production in developing countries. The paper comments throughout on areas where further work is required to refine the projection method and qualifies the generally optimistic outlook by identifying the types of actions that will be needed to accelerate food consumption and production in developing countries. Pricing policies in agriculture are seen as being particularly critical to the optimal development of the agricultural system in developing countries.

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PROSPECTS FOR FOOD PRODUCTION AND CONSUMPTION IN DEVELOPING COUNTRIES

Introduction

1. The available evidence indicates that, in aggregate, the growth in world food production over the past two decades has more than kept pace with the growth in population. Improvements in per capita consumption among the developing countries have been widespread. The important exceptions have included many of the countries of sub-Saharan Africa. Associated with this improvement has been the adoption and success of improved technologies, increased investment in infrastructure vital to increased agricultural production and, for some countries, a diminishing of the price distortions which have disadvantaged agricultural production. Substantial production increases have been recorded particularly in the case of rice and wheat, leading to declining actual and expected prices for grains.

2. We believe it is likely that these improvements in food availability in the developing countries will continue, but that any such improvements would be considerably enhanced by widespread adoption in developing countries of pricing policies which remove the existing distortions under which agricultural production labors.

3. In this paper we illustrate the changes that have occurred in food consumption in developing countries over the past 20 years and compare them to changes in the industrial countries. We then present the forecasts of food consumption growth which have recently been assembled in the World Bank and briefly outline their implications for per capita consumption, production and prices in developing countries.

4. We are not directly concerned here with the question of hunger, whether chronic or periodic. We agree with the view that hunger is not directly related to the level of world food availability, but is more a question of income level, or as Sen puts it, the "entitlement" to sufficient resources to purchase enough food to live. The many studies which the World Bank for one has done on the cost effectiveness of programs to meet chronic hunger among specific groups and periodic hunger due to sharp reductions in food supplies have recently been summarized by Reutlinger, (1981/82).

Historical Growth of Income and Food Consumption

5. The last 20 years has been a period of substantial growth for some developing countries. The concentration of this growth can be shown as follows: of the 68 developing countries (World Bank definition) for which there are purchasing-power-parity (PPP) estimates1/ of GDP/capita available, only 19 countries recorded GDP/capita growth, in real terms, in excess of 2% p.a. for both the 1960-70 decade and the period 1970-79. 2/ There are no PPP estimates available for them, but to this list should probably be added Hong Kong, Republic of Korea, Singapore and perhaps the Peoples' Republic of China.

1/ Purchasing-power-parity estimates of national income, (i.e., estimated in terms of a set of international prices) are preferred to traditional exchange rate adjusted GDP estimates because they better reflect the purchasing power of income in each country. The PPP estimates flow from the United Nations/World Bank project on International Comparisons of Real Product carried out by Irving Kravis, et. al.

2/ The countries are: Barbados, Brazil, Costa Rica, Cyprus, Egypt, Gabon, Guatemala, Indonesia, Iraq, Malaysia, Malta, Nigeria, Portugal, Sri Lanka, Saudi Arabia, Thailand, Tunisia, Turkey and Yugoslavia.

Of this group of 68 developing countries, another 15 recorded GDP/capita growth in excess of 2% p.a. for the 1970-79 period only. 1/ By comparison, of the 23 industrial countries for which similar national income data are available only seven countries (Australia, Luxembourg, Netherlands, New Zealand, Sweden, Switzerland and United Kingdom) did not grow at rates in excess of 2% p.a. for either one of these two periods, and only New Zealand grew at less than 2% p.a. for both periods. 2/

6. How has this growth, or lack of growth, of the per capita incomes of developing countries affected food consumption in those countries? To give a broad picture of the impact, growth in per capita calorie consumption of all foodstuffs has been plotted against growth in income (PPP) for the developing countries in Figures 1 and 2. In Figure 1 each developing country's average income/capita growth for the 1960-70 period is plotted against its growth rate of total per capita calorie consumption for the period 1963-70 (end-point growth estimates). In Figure 2 income/capita growth for the period 1970-79 is plotted against calorie growth for the period 1970-77. 3/ In using this measure of improvements in food consumption we recognize the difficulties

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1/ The countries are: Algeria, Bolivia, Cameroon, Colombia, Dominican Republic, Ecuador, Gambia, Kenya, Mauritius, Morocco, Paraguay, Philippines, Sudan, Surinam, and Trinidad and Tobago.

2/ The industrial country group includes Greece, Israel and Spain--countries that have until recently been classified as developing countries.

3/ For calorie consumption, the periods 1963-70 and 1970-77 are the closest approximations we can get, given the available data, to the decades of the 1960s and 1970s. The figures for calorie consumption in 1963 are the averages of the years 1961 to 1965 while the figures for 1970 and 1977 are the averages of the three years about these mid-points. The data on per capita calorie consumption are taken from FAO, 1980.

associated with the measurement of "adequate" diets. 1/ All that is being implied in our use is that at these levels of food consumption, growth in calorie consumption does represent an improvement in living standards.

7. In Figures 1 and 2 the north-east quadrant represents an increase in both per capita income and food consumption. The south-west quadrant represents a decline in both. There is a positive correlation between per capita income and food consumption growth in both periods. In the 1960s all but four of this group of developing countries registered growth in income/capita, while eight registered a decline in per capita food consumption. When a country at these levels of food consumption registers growth in per capita income but declining per capita food consumption, as most of these eight did, the answer must lie in the shape of the income distribution of the new income generated (i.e., it is so unevenly distributed in favor of the already wealthy that demand for food is affected little) or in the food-pricing policies of the country (i.e., relative prices are so distorted that food consumption is seriously disadvantaged). Four of those countries which had declining food consumption in the 1960s (Algeria, Colombia, Guyana, and Upper Volta) were able to reverse the situation in the 1970s--even though in the case of Guyana and Upper Volta they experienced declining income/capita in the latter period. India, the Ivory Coast, Niger and Nigeria, along with many others, suffered declining food/capita levels in the second period. In this latter period there

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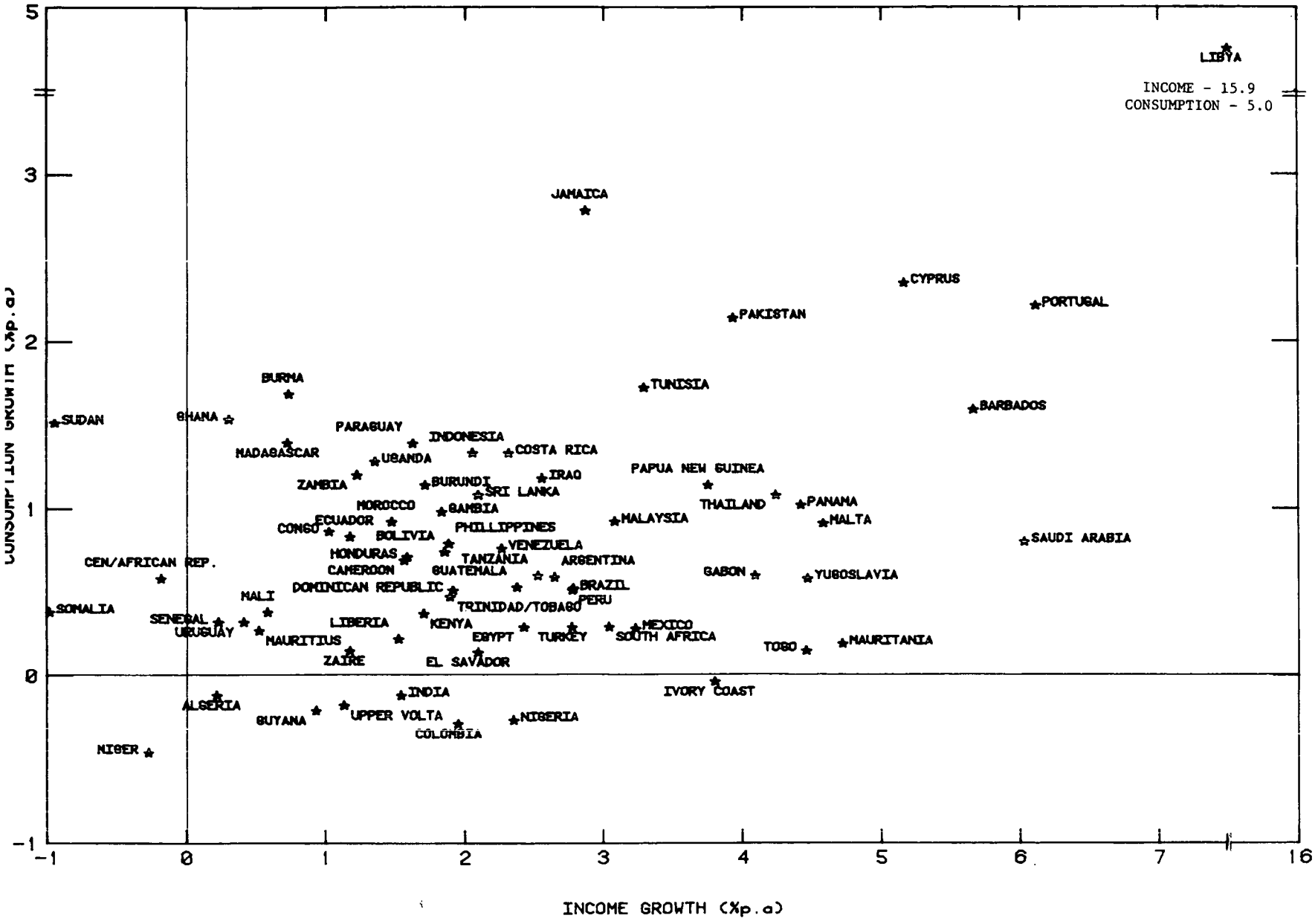
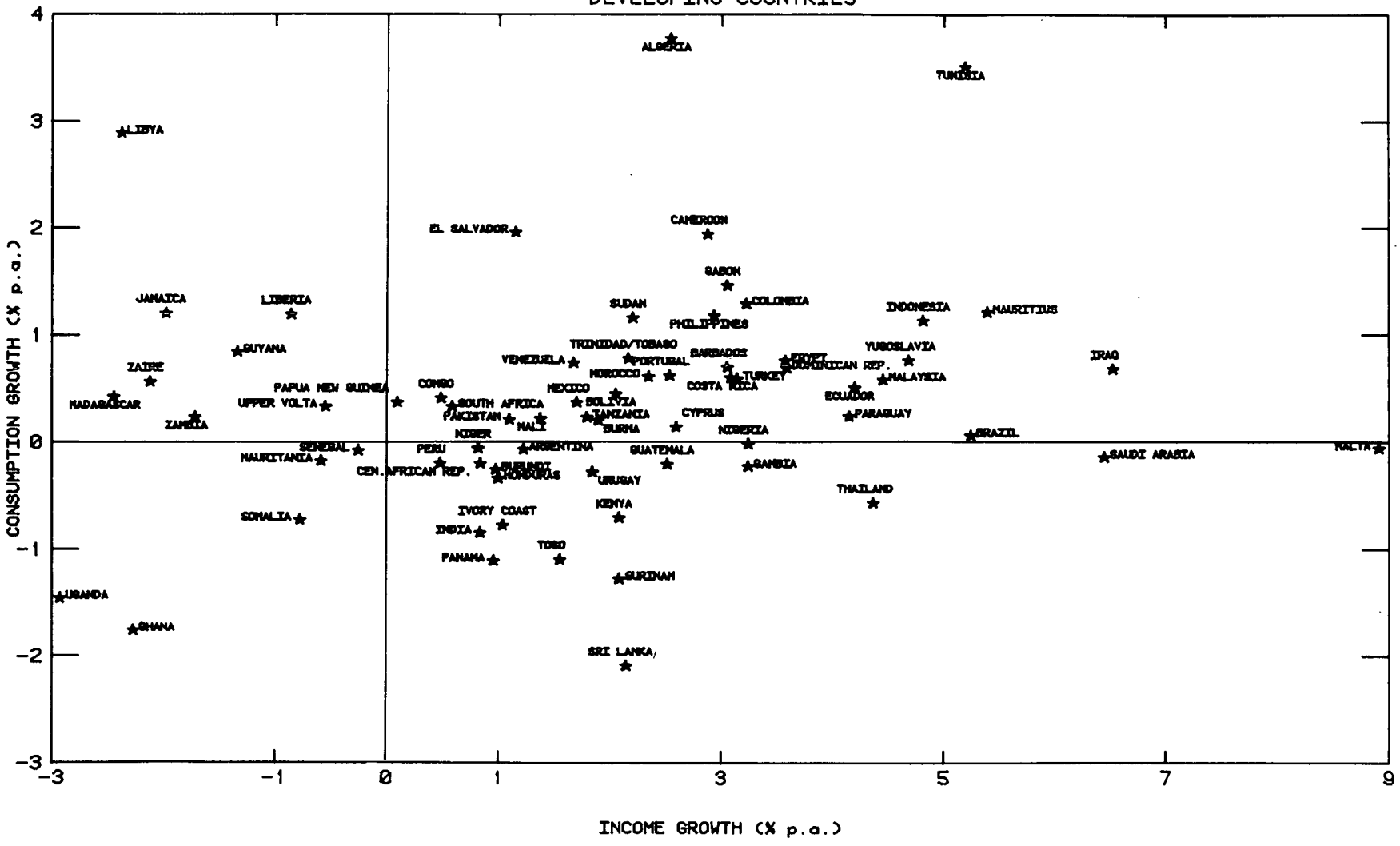
1/ For a critique of the estimation of basic food needs see Eberstadt.

FIGURE 1: INCOME AND CONSUMPTION GROWTH - 1960s
DEVELOPING COUNTRIES



SOURCES: INCOME GROWTH, WORLD BANK ESTIMATES; CONSUMPTION GROWTH DERIVED FROM FAO, FOOD BALANCE AVERAGE AND PER CAPITA FOOD SUPPLIES 1961-1965 AVERAGE 1967-1977.

FIGURE 2: INCOME AND CONSUMPTION GROWTH - 1970s
DEVELOPING COUNTRIES



SOURCES: INCOME GROWTH, WORLD BANK ESTIMATES: CONSUMPTION GROWTH DERIVED FROM FAO, FOOD BALANCE AVERAGE AND PER CAPITA FOOD SUPPLIES 1961-1965 AVERAGE 1967-1977.

seems to have been a worsening of the factors which have led to the countries appearing in the south-east quadrant. 1/

8. The obvious difference in the developing countries' performance in the two time periods is that the 1970s gave rise to much more dispersed behavior than the 1960s. The increased number of countries registering lower per capita incomes in the 1970s explains part of this dispersion; with the countries in the north-west quadrant more likely to be those with food policies favoring low-income consumers than those countries in the south-west quadrant. Increased agricultural instability in the 1970s together with pricing policies descriminating against agricultural production are likely causes of the large number of countries in the south-east quadrant. 2/

1/ We tried, without success, to explain these differences in performance in terms of income distribution and relative price distortion measures. To measure distortions in consumer prices nominal protection coefficients on grains production, which measure the distortions in producer prices, were assembled for 18 of these countries. Nominal protection coefficients are probably not a good measure of distortions in consumer prices, but no other measures are available. Gini coefficients were used as one measure of income distribution. These are available for about 30 of these developing countries. Like the nominal protection coefficients the Gini coefficients have been estimated at different periods of time over the last two decades. Further, the quality of the data on which they have been estimated is extremely varied. Neither of these variables could explain any of the variation in equations in which the growth of calorie consumption was to be explained by the growth of per capita income, the level of per capita income, income distribution and distortions in consumer prices. Life expectancy in 1960 and 1980 was tried as a proxy for income distribution, but it also gave insignificant results. The results for this last equation were as follows:

$$C = 0.17\ Y + 0.003\ LE + 0.0003\ YCAP,\ R^2(adj) = 0.42$$
$$\quad (4.5) \quad (0.12) \quad (3.0)$$

t statistics are in parentheses

For this equation the observations for both periods were combined; also, the constant is constrained to zero.

2/ Barr shows that the variability of world food production was higher in the 1960s than in the 1950s and higher again in the 1970s.

Reutlinger has shown that, in the face of reductions in domestic production, developing countries have been unwilling to compensate for the shortfall by increasing food imports. Therefore, artificially low food prices in developing countries (a widespread practice,often aimed at the politically more powerful urban consumers) do not necessarily mean increased consumption. Besides the restriction on imports, artificially low producer prices (also a widespread practice, particularly in African countries) mean lower incomes and hence lower consumption in the rural areas--where most of the population and most of the poor often reside.

9. To give an idea of what these changes in food consumption have meant in aggregate terms for the developing countries we have constructed Table 1. These figures show the improvement in per capita food supplies in the developed and developing market economies (FAO definition) over the period between 1961-65 (average) and 1977 and the sources of the calories and protein consumed. Over this approximately 15-year period the per capita consumption of calories in developing countries has increased by 4.1% and the consumption of protein by 2.8%. 1/ Both in absolute and percentage terms the developed market economies have done much better--with per capita calorie consumption increasing by 6% and per capita protein consumption increasing by 7.6%. During this period food production actually increased more slowly in industrial countries than in developing countries, but their rate of population increase was much slower than that of developing countries, giving rise to the higher per capita gains. 2/

1/ These are average figures which convey little information about how well the different income groups in the developing countries have fared.

2/ See Barr, op. cit.

TABLE 1: PER CAPITA FOOD SUPPLIES BY MAJOR ECONOMIC REGIONS /A AND BY FOOD CATEGORY, 1961-65 (AVERAGE), AND 1977

FOOD CATEGORY	PER CAPITA CALORIE SUPPLY				PER CAPITA PROTEIN SUPPLY				PERCENTAGE OF WORLD CALORIE SUPPLY	
	DEVELOPED MARKET ECONOMIES		DEVELOPING MARKET ECONOMIES		DEVELOPED MARKET ECONOMIES		DEVELOPING MARKET ECONOMIES			
	1961-65	1977	1961-65	1977	1961-65	1977	1961-65	1977	1961-65	1977
	(calorie/day)				(gram/day)				(%)	
CEREALS	961	891	1,229	1,274	27.3	25.1	29.5	30.8	51.4	51.1
WHEAT	642	592	290	372	20.7	19.0	8.5	10.9	18.1	18.6
RICE	192	171	545	544	3.4	3.1	10.4	10.3	19.3	20.2
MAIZE	71	86	175	178	1.7	1.9	4.4	4.5	5.9	5.8
MILLET & SORGHUM	2	2	175	147	0.1		5.0	4.2	4.7	4.1
ROOTS AND TUBERS	148	123	147	143	3.2	2.8	1.5	1.5	8.0	6.4
SUGARS AND HONEY	384	444	182	209			0.2	0.2	8.5	9.4
PULSES	35	28	115	92	2.3	1.8	7.0	5.6	3.5	3.1
NUTS AND OILSEEDS	53	58	48	44	2.6	2.7	1.6	1.6	2.1	1.9
VEGETABLES	57	64	26	29	3.1	3.4	1.5	1.6	1.6	1.6
FRUIT	89	98	63	66	1.1	1.3	0.7	0.8	2.2	2.4
MEAT AND OFFALS	420	525	63	67	22.3	29.0	4.7	5.0	7.3	8.2
EGGS	50	54	4	7	4.0	4.4	0.3	0.5	0.8	0.8
FISH AND SEAFOOD	40	49	11	15	5.9	6.9	1.8	2.4	0.8	1.0
MILK	279	289	66	67	16.2	17.3	3.9	4.0	5.0	4.6
OILS & FATS	440	510	129	154	0.2	0.2			8.4	9.0
VEGETABLE OILS & FATS	256	359	100	123	0.1	0.1			5.4	6.4
ANIMAL OILS & FATS	184	151	29	31	0.1	0.1			3.0	2.6
TOTAL VEGETABLE PRODUCTS	2,151	2,280	1,940	2,016	41.4	39.3	42.6	42.9	83.5	83.1
TOTAL ANIMAL PRODUCTS	977	1,073	173	188	48.6	57.7	10.8	12.0	16.5	16.9
GRAND TOTAL (EXCL. ALCOHOL)	2,977	3,156	2,092	2,178	89.4	96.2	53.3	54.8		

/A FAO COUNTRY CLASSIFICATION.

SOURCE: CONSTRUCTED FROM FOOD BALANCE SHEETS 1975-77 AVERAGE AND PER CAPUT FOOD SUPPLIES 1961-65 AVERAGE 1967 TO 1977, FAO ROME 1980.

10. When examined in terms of the sources of these food supplies there have been some marked changes for some food categories and for others a disappointing lack of change. While the total per capita direct supply of calories and protein obtained from the cereals group by people in developing countries has increased slightly over the period, there have been sharp changes for individual cereals. The amount of wheat consumed directly, measured in terms of calories, increased by 28% while the per capita calorie supply of millet and sorghum fell by 16%. On a geographical basis the regions responsible for these changes were Africa and Asia. In per capita terms wheat consumption rose by 44% in Asian countries and by 32% in African countries. Millet and sorghum consumption fell by 11% in Asian countries and by 16% in African countries. Within the developing countries there have generally been the kinds of changes in food sources that would be expected with improved living standards, but just as the total increase in food consumption has been small over this period, most of the changes observed have been small. For example, we would expect per capita consumption of roots and tubers and pulses to decline and consumption of fruit, vegetables, meat, eggs, fish and seafoods and milk to increase. These changes have indeed taken place, and in percentage terms some of the changes are large, but in absolute terms the only significant change has been the decline in pulses (20%).

11. At the world level (see the last two columns in Table 1) the percentages of total calorie consumption supplied by these various categories of foodstuffs have also changed little. Cereals still account for 51% of the total, with wheat and rice becoming more important and maize and millet and sorghum relatively less important. The decline in per capita consumption of

roots and tubers in both developed and developing countries is the most significant change. The improvement in meat consumption is absolutely and proportionately mostly a result of the increase in developed countries. The declining importance of milk products and animal fats and their substitution by vegetable fats and oils, shows up here, even in developing countries.

12. If we take the present consumption levels of the developed countries as the norm towards which developing countries are moving we can see that the major changes that will take place in the pattern of food consumption, and which will be reflected in production and trade patterns, will be in terms of considerable decreases in the importance of cereals and roots and tubers, and considerable increases in the importance of sugars and honey, meat, milk, and vegetable oils and fats. Of course, when allowance is made for both livestock feed as well as direct human consumption, the net impact on cereals consumption in total may well be an increase in importance in absolute and per capita terms.

13. But such conjectures can only give a guide to the products which can be expected to be more or less important over the very long run. More to the point, what are the changes we are likely to see in the next 20 years in terms of the levels of food consumption reached in the developing countries and the changes in importance of the various categories of foodstuffs? Further, what will the expected developments in food consumption mean for the future pattern of production and prices of foodstuffs?

World Bank Forecasts of Food Consumption by 1995

14. Within the Commodities Division of the World Bank we have recently carried out an exercise which in part led to forecasts to the year 1995 of world (and regional) production, consumption, trade and prices of many primary commodities of importance to developing countries. The commodities included do not cover the entire food basket of developing countries, but represent about 70% of the total.

15. For the most part these long-term projections were derived using comparative-static equilibrium models, disaggregated by region, where prices are used to achieve a unique equilibrium solution. Since the models are long-run, stock level changes are ignored. The models are demand-determined and the consumption projections were made first by applying income elasticities of demand by region to projected per capita GDP and population. Given a set of regional price elasticities of supply and demand and productivity growth rates, prices were adjusted such that through successive iterations global production and consumption converged to equilibrium. The models assume an absence of shocks on both the consumption and production sides. Information concerning production developments in key countries and likely changes in factors affecting the market such as international commodity agreements were incorporated at the appropriate level. Income and price elasticities are assumed to change over time with the evolution of a region's income level.

16. The basic position that we take on projections of food consumption is that the amount and composition of food is, in the aggregate and in the long

run, determined by aggregate demand. In this we differ from those who take a physical capacity-cum-productivity possibility approach. That is, we believe that the resources allocated to food production, including resources allocated to productivity-enhancing research, are endogenous. We acknowledge that in some countries the food-producing sector is so large a proportion of total national product that it cannot be regarded as not being simultaneously determined with aggregate demand. Further, there are also distortions of prices which disturb food production from the levels that would otherwise be determined by aggregate demand. However, while these influences are important, often extremely important for individual countries, for this exercise we chose to assume that they are captured in the projections of income growth.

17. In looking at the level and composition of food consumption, our focus on aggregate demand implies that both at the world level and at the country level access to food is not determined by physical constraints on food production either within individual countries (because a country can import whatever food it can pay for) or at a world level (because production will respond to price incentives). Thus, it follows that we do not see the solution of any "food problem" at the world level or within a particular country as a question of overcoming food production problems on a world basis or within a country, but as a problem of obtaining the maximum economic growth--within the economic constraints. However, distortions of relative prices within a country which tax food production and consumption may well reduce national income growth and make the task of improving food consumption levels more difficult than it otherwise would be.

18. The long-term forecasts shown in Table 2 are conditional in nature. On the demand side they rest critically on the assumptions made about the world economy in the 1980s and 1990s. The forecasts, moreover, are positive rather than normative. They are based on the most likely assumptions concerning government policies affecting production and trade, the likely market structures and demand conditions. Given the use of the resulting price forecasts in project and balance of payments analyses by the World Bank Group, trying to determine what is most likely to happen, as opposed to what would happen if desirable changes in policies and market structure were to take place, becomes inescapable and appropriate.

19. The assumptions adopted about growth in the world economy and in the industrial, centrally planned and developing economies, represent the mid-point of the High and Low scenarios described in the World Bank's World Development Report, 1982. The population projections are also those of World Development Report, 1982. These projections of income and population are shown in Table 3.

TABLE 2: FOODSTUFFS - PROJECTIONS OF APPARENT CONSUMPTION, BY ECONOMIC REGIONS /A

	INDUSTRIAL COUNTRIES				CENTRALLY PLANNED ECONOMIES				DEVELOPING COUNTRIES				WORLD GROWTH RATES	
	1980	1985	1990	1995	1980	1985	1990	1995	1980	1985	1990	1995	1961-80	1980-95
	/B			/C	/B			/C	/B			/C	/B	/C
WHEAT	89.3 (1.7)	94.8	104.2	114.5 (1.7)	145.9 (3.1)	158.7	175.2	193.4 (1.9)	208.5 (4.7)	260.9	319.8	390.1 (4.3)	3.4	3.1
RICE	9.5(-0.6)	10.0	10.3	10.5 (0.7)	14.5 (1.9)	16.0	17.7	19.0 (1.8)	236.1 (3.0)	269.5	313.0	363.5 (2.9)	2.7	2.8
COARSE GRAINS /D	252.6 (2.1)	252.9	260.3	270.4 (0.5)	161.7 (4.0)	198.4	215.4	249.0 (2.9)	297.5 (2.8)	348.3	411.6	481.8 (3.3)	2.8	2.3
SUGAR	25.1 (1.3)	25.6	26.2	26.8 (0.4)	17.7 (2.3)	18.5	19.4	20.4 (1.0)	54.8 (3.6)	63.9	74.4	84.6 (2.9)	2.6	2.0
BEEF AND VEAL	20.6 (2.1)	22.4	24.2	27.0 (1.8)	9.5 (4.1)	10.5	12.1	14.0 (2.6)	16.5 (2.6)	18.9	21.2	24.7 (2.7)	2.6	2.3
FRESH CITRUS FRUITS	26.1 (4.5)	28.7	31.1	34.0 (1.8)	1.7 (6.9)	1.9	2.3	2.7 (3.1)	28.6 (5.1)	34.6	41.0	48.5 (3.6)	4.8	2.8
VEGETABLE FATS AND OILS														
- SOYBEANS (OIL EQUIVALENT	6.8 (5.7)	7.6	8.6	9.6 (2.3)	0.7 (7.9)	0.8	1.0	1.2 (3.7)	7.3 (6.0)	8.9	11.7	16.2 (5.5)	5.9	4.1
- PALM OIL	1.0 (6.9)	1.1	1.2	1.3 (1.7)	0.1(19.8)	0.1	0.2	0.2 (2.9)	3.8 (8.1)	4.9	6.3	8.5 (5.6)	7.9	4.9
- COCONUTS (OIL EQUIVALENT)	1.0 (0.6)	1.1	1.2	1.3 (1.7)	0.1 (3.9)	0.2	0.2	0.2 (2.7)	1.7 (1.7)	1.9	2.2	2.6 (2.9)	1.4	2.5

/A WORLD BANK CLASSIFICATION OF COUNTRIES, SEE *WORLD DEVELOPMENT REPORT*, 1982. NOTE THAT CHINA IS INCLUDED.

/B THE NUMBERS IN THIS COLUMN ARE THE ACTUAL GROWTH RATES (LEAST SQUARES TREND) FOR THE PERIOD 1961-80.

/C THE NUMBERS IN THIS COLUMN ARE THE PROJECTED GROWTH RATES (END POINTS) FOR THE PERIOD 1980-95.

/D COARSE GRAINS HERE INCLUDE MAIZE, BARLEY, OATS, RYE, GRAIN SORGHUM AND MILLET.

SOURCE: FAO, *PRODUCTION YEARBOOK*, 1981, *TRADE YEARBOOK*, 1981 (ACTUAL 1980 DATA); WORLD BANK (PROJECTIONS).

TABLE 3: PROJECTED REAL GDP GROWTH AND POPULATION GROWTH, BY MAJOR ECONOMIC REGION, 1983-95
(% CHANGE PER ANNUM)

	REAL GDP GROWTH		POPULATION GROWTH		
	1983-90	1990-95	1960-80	1980-90	1990-95
INDUSTRIAL COUNTRIES	3.7	3.5	0.9	0.5	0.5
CENTRALLY PLANNED ECONOMIES			1.3	1.2	1.0
EAST EUROPE	3.5	3.5	1.0	0.9	0.7
DEVELOPING COUNTRIES*	4.9	5.3	2.2	2.0	1.9
OIL EXPORTERS	6.1	6.4	2.6	2.6	2.4
OIL IMPORTERS	4.6	5.1	2.2	1.9	1.8
- LOW INCOME	3.2	3.8	2.1	1.8	1.7
SUB-SAHARAN AFRICA			2.6	3.1	2.9
ASIA			2.1	1.7	1.6
- MIDDLE INCOME	4.8	5.4	2.3	2.2	2.0
CHINA	4.9	5.0	1.9	1.3	1.2
WORLD	3.9	3.8	1.9	1.7	1.6

* EXCLUDES PEOPLES' REPUBLIC OF CHINA IN THE GDP DATA BUT INCLUDES IT IN THE POPULATION DATA.

SOURCE: WORLD BANK, ECONOMIC ANALYSIS AND PROJECTIONS DEPARTMENT, INTERNATIONAL TRADE AND CAPITAL FLOWS DIVISION AND ECONOMIC AND SOCIAL DATA DIVISION.

20. Looking at the growth rates in world consumption for the period 1961-80 (Table 2) we can see that the importance of industrial countries in world consumption of these foodstuffs has declined in the past 20 years. Growth in consumption of these commodities has been faster in the centrally planned economies and the developing countries, reflecting their lower levels of income, and their faster income and population growth. However, as we have seen earlier, on a per capita basis food consumption has grown much faster in industrial countries than in developing countries.

21. Overall, the growth in total consumption of these commodities is expected to be lower in the period 1980-95 than in the period 1961-80 except for rice and coconuts (see growth rates in last two columns). 1/ The decline in the expected rate of growth of wheat consumption is largely a function of the expected much slower growth in the centrally planned economies; and the expected slowdown in growth of coarse grains consumption is a result of the expected slowing of growth in industrial countries and centrally planned economies and the consequent adverse effect on the demand for meats and feedstuffs. The developing countries are expected to maintain their historical growth in grains consumption. This, together with the expected slower growth in population in developing countries should mean a slightly faster growth in per capita grains consumption in developing countries than in the past 20 years. Bringing together the consumption growth rates of Table 2 and the population growth rates of Table 3, it can be seen that the per capita consumption of wheat, rice and coarse grains by the developing countries was 2.5%, 0.8% and 0.6% per annum, respectively, over the 1961-80 period. The projected per capita consumption growth rates for these grains in the period 1980-95 are 2.3%, 0.9% and 1.3% respectively. The much higher rate of growth of coarse grains is a reflection of the expected increase in the consumption of animal products.

22. In its major study of future food availability scenarios for developing countries the FAO made the following projections. If, in the period 1980 to 2000, the GDP of developing countries grows at much the same rate as in the

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1/ A large part of this increase in coconut product consumption will be for non-edible uses, particularly soaps and detergents.

past 20 years per capita food demand is projected to average 0.44% p.a. growth. This is a faster rate of growth in per capita consumption of developing countries than the 0.3% p.a. rate achieved in the 1963-77 period (see Table 1). Under an assumption of much higher GDP growth, coincident with greater investment in agriculture and relaxation of trade distortions within developing countries and between developing countries and industrial countries, it was projected by FAO that per capita food demand could grow by 0.75% p.a. The projections of the first FAO scenario appear compatible with our expectations of a slightly faster growth in per capita grains consumption in the next 15-20 years.

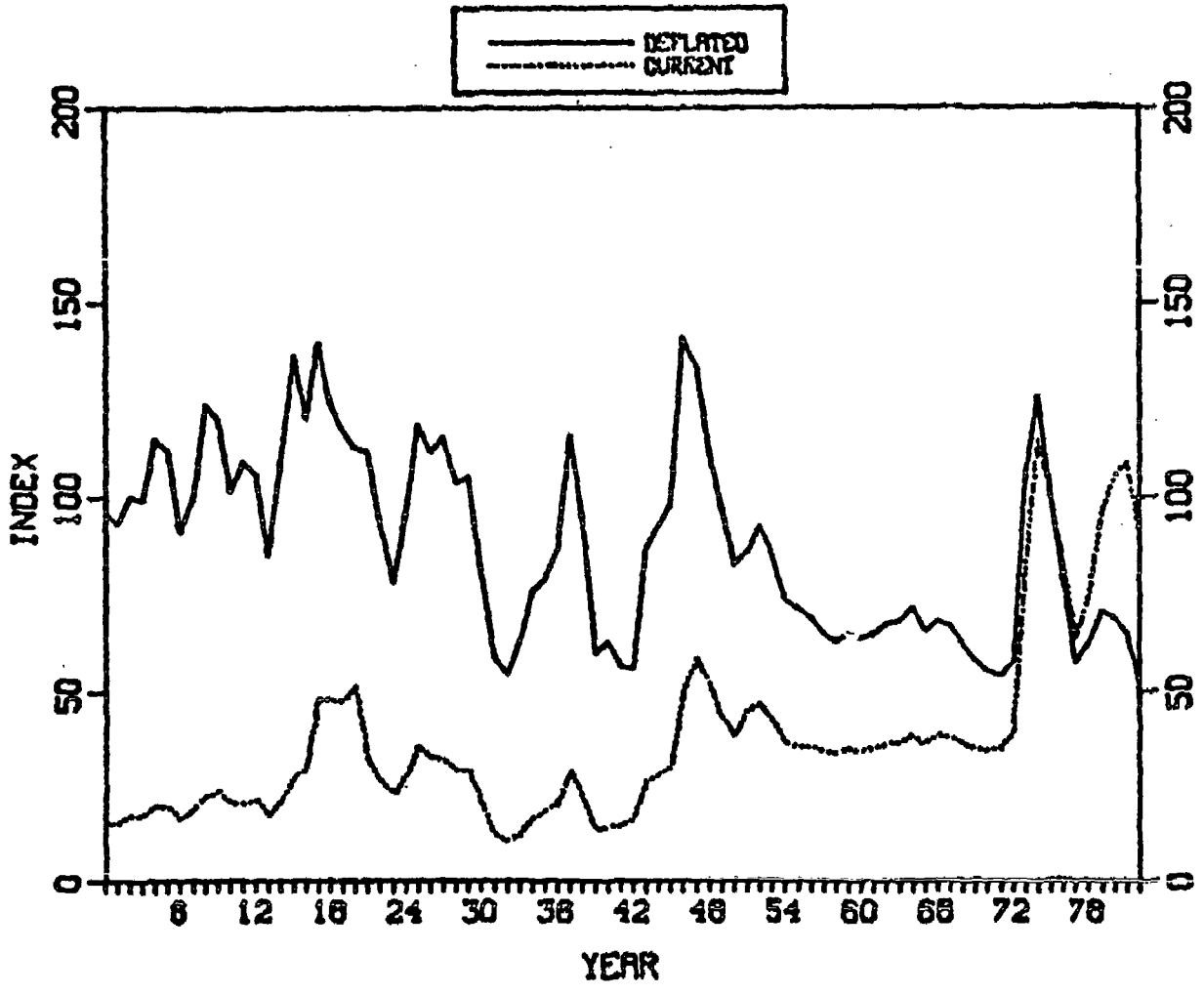
Price Developments

23. The cereals price forecasts to which this exercise led show a continuation of the long-term declining trend in real terms (see Figures 3, 4 and 5 for long-term price series for wheat, rice and maize). 1/ Even though incomes are increasing, and the growth of incomes in the developing countries is having a larger impact in terms of total food demand, food demand remains essentially price and income inelastic. Supply will respond to any increase in demand with improvements in technology. The result will be a fall in prices. The events of the past decade seem to bear this out. With an expansion of demand for cereals for human consumption and for feed grains--from the fast-growing developing countries and the centrally planned economies--supply has

1/ The maize price has shown a different pattern than wheat and rice prices with a period of higher prices in the post-World War II period than in the period prior. As maize is the premium feed grain, this is consistent with the fact that beef prices were significantly higher also during the post-World War II period.

FIGURE 3: WHEAT PRICE INDEXES, 1900-1982

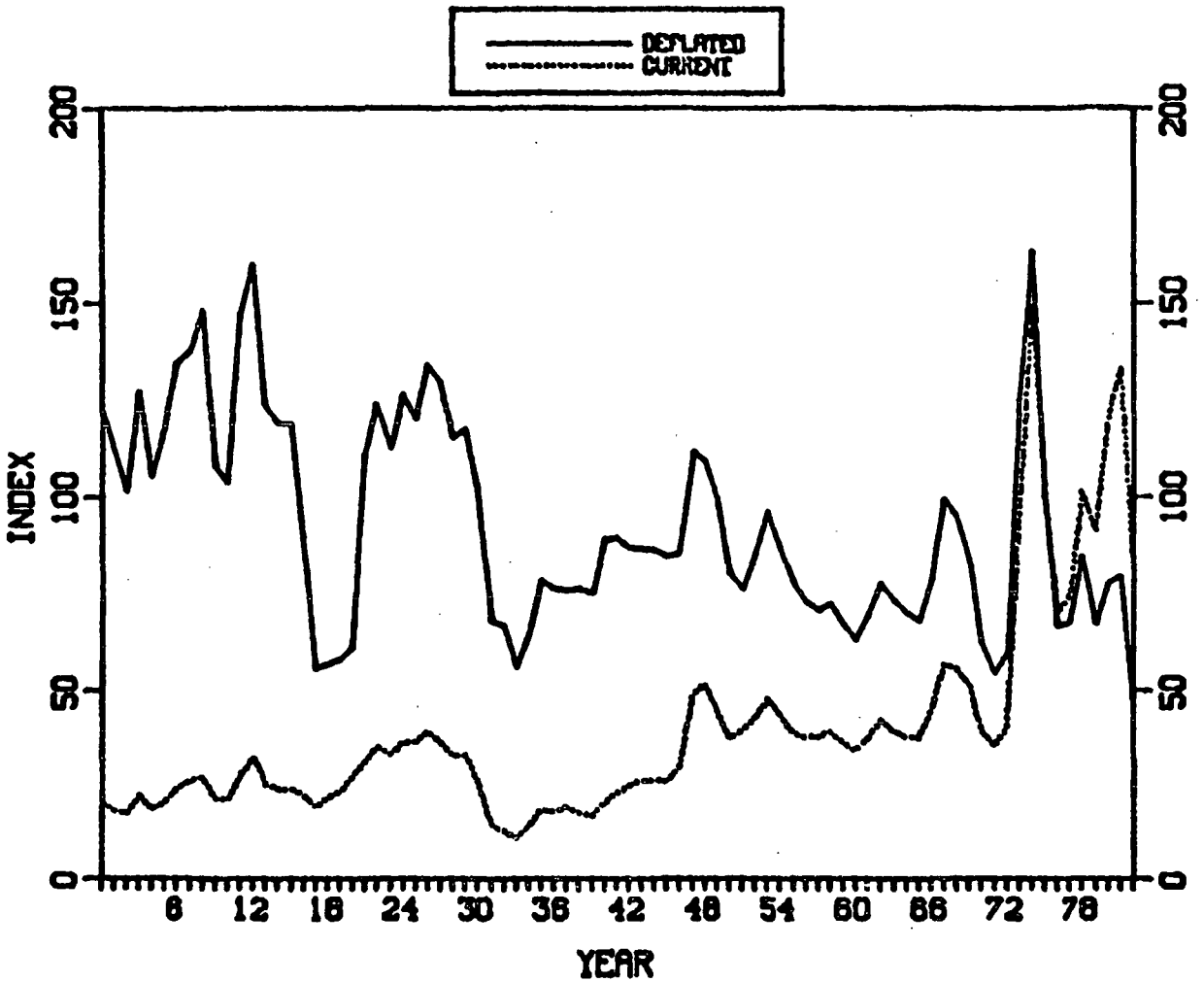
(1975=100)



SOURCE: COMPILED AND SUPPLIED BY ENZO GRILLI AND MAW-CHENG YANG, ECONOMIC ANALYSIS AND PROJECTIONS DEPARTMENT, WORLD BANK, THE PRICE SERIES IS CANADIAN NO. 1 NORTHERN, IN STORE PORT WILLIAM/PORT ARTHUR FOR 1900-47; CANADIAN NO. 1 WESTER RED SPRING IN STORE THUNDER BAY FOR 1948-82 AND THE DEFLATOR IS US WHOLESALE PRICE INDEX.

FIGURE 4: RICE PRICE INDEXES, 1900-1982

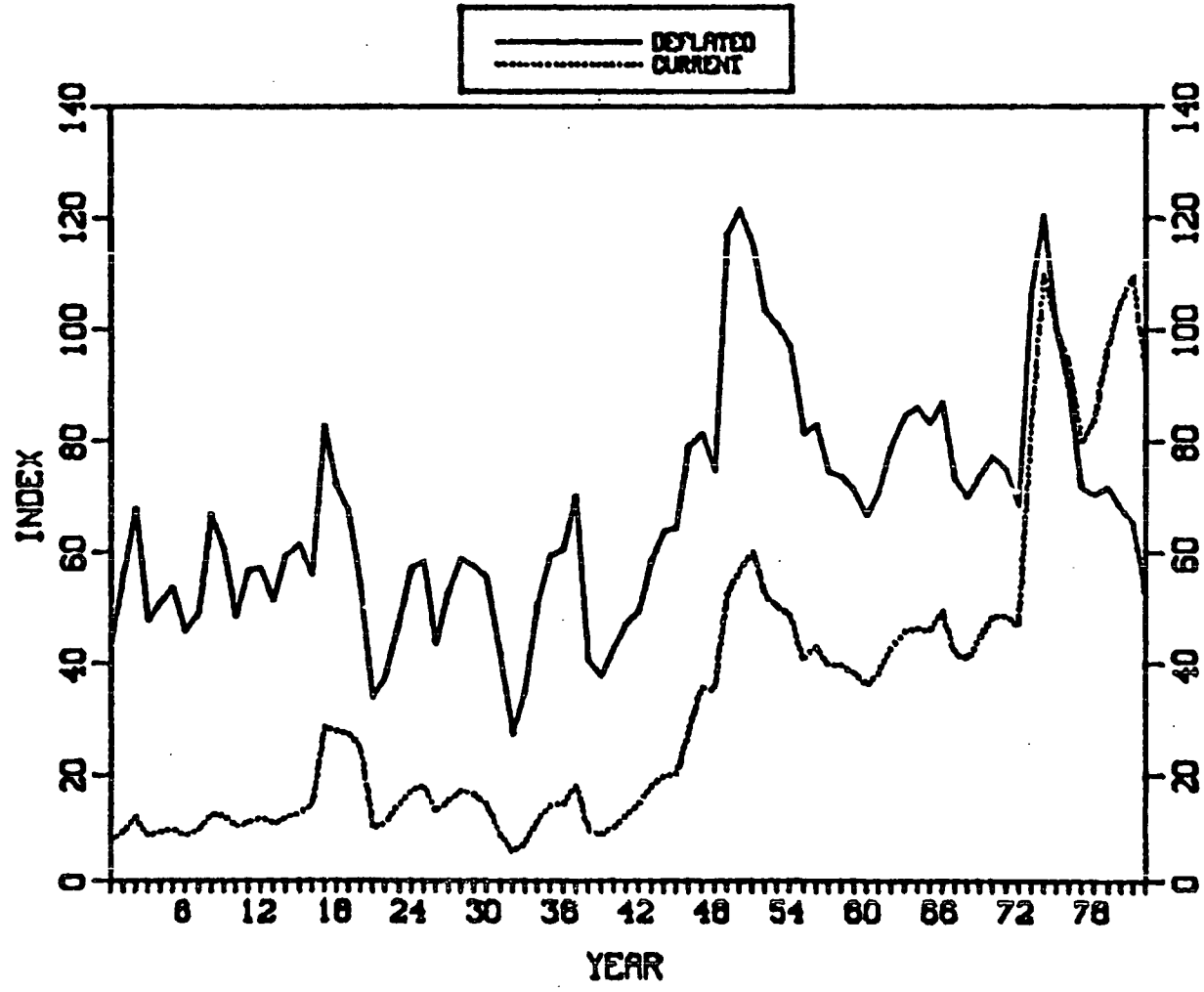
(1975=100)



SOURCE: COMPILED AND SUPPLIED BY ENZO GRILLI AND MAW-CHENG YANG, ECONOMIC ANALYSIS AND PROJECTIONS DEPARTMENT, WORLD BANK. THE PRICE SERIES IS BOAT PADDY, RANGOON FOR 1900-47; THAI 5% BROKEN, FOB BANGKOK FOR 1948-82. THE DEFLATOR IS THE US WHOLESALE PRICE INDEX.

FIGURE 5: MAIZE PRICE INDEXES, 1900-1982

(1975=100)



SOURCE: COMPILED AND SUPPLIED BY ENZO GRILLI AND MAW-CHENG YANG, ECONOMIC ANALYSIS AND PROJECTIONS DEPARTMENT, WORLD BANK. THE PRICE SERIES IS US NO. 2 YELLOW FOB GULF PORTS FOR 1948-82; US NO. 3 YELLOW FOR 1900-47. THE DEFLATOR IS THE US WHOLESALE PRICE INDEX.

responded. Much of this supply response has been in the grain growing areas of North America and Oceania, which have a comparative advantage in production of grains.

24. Our analysis indicates that the increase in the per capita growth rate for rice consumption (the staple food of the major proportion of low-income people) through the projection period will be accompanied by a substantial reduction in price and in trade in rice. Among the developing countries, Indonesia (historically the largest importing country) has displayed the most remarkable growth in consumption and production, with both increasing at 5% p.a. over the past 20 years. This has resulted in an increase in self-sufficiency and the likelihood of smaller imports in most years, as in 1981. Other developing country importers (such as Republic of Korea, India and Bangladesh) have also become less reliant on trade, one of the consequences of the Green Revolution. Together with a continuation of the expansion of rice production in the United States (since 1975 when acreage controls were relaxed) and production subsidies in Japan, it is anticipated that world prices on the relatively small international market will face continuing downward pressure.

Production and Yields

25. Grains occupy by far the largest part of land under agricultural production. Continuing increases in area harvested similar to those experienced in the past are unlikely. 1/ Reliance on yield increases will probably rise.

1/ However, the FAO, ibid. estimated that there was still considerable potential for area expansion in developing countries.

The potential for such increments exists and past experience, particularly in developing countries is encouraging.

26. Over the 1980-95 period world production growth for the major food-crops is projected as follows: rice 2.8% p.a. wheat 3.1% p.a. and coarse grains 2.3% p.a. If yields of wheat and coarse grains were to continue to grow at recent rates these production increases would be achieved with little increase in area harvested. Attainment of the rice production projections, however, will necessitate just as much reliance as in the past on increases in area harvested, or more likely, a faster rate of growth in rice yields than in past years. Such a possibility exists as the major rice growing countries are envisaged to increase the use of fertilizer, continue to develop water control systems, as well as adopt other improved production practices. Unlike industrial countries, where wheat, coarse grains and rice yields are already growing at best at a constant rate, and in some cases at a declining rate, yields in developing countries are generally growing at an increasing rate. In other words, in both rice and wheat, developing countries appear to be on the way to catching up to the industrial countries in yields. For coarse grains the picture seems similar but perhaps not so strong. The exception to this encouraging performance by the developing countries has been in Africa, where production of grains has lagged as improvements in yields have been much slower than in other developing areas. This has been particularly evident in rice and coarse grains (see Table 4 below). In Table 4 we also provide our developing countries projections on a regional basis; these indicate that African countries will fall even further behind other developing countries in the years ahead. Domestic price distortions which reduce incentives for agricultural production may well be a leading factor in reducing the incentives to adopt

new technology in these countries. Under these circumstances the pay-off to agricultural research and to other public investments such as roads and dams will not be as profitable as they otherwise would be.

TABLE 4: GROWTH /A IN PRODUCTION 1961-80 (ACTUAL) AND 1980-95 (PROJECTED), AREA HARVESTED AND YIELDS 1961-80, IN MAIN DEVELOPING COUNTRIES

	PRODUCTION		AREA HARVESTED	YIELDS
	1961-80	1980-95	1961-80	1961-80
RICE (PADDY)				
ASIA	2.9	2.9	0.8	2.1
AFRICA	2.7	2.0	2.5	0.2
LATIN AMERICA	3.4	3.4	2.8	0.6
WHEAT				
ASIA	5.9	4.1	1.7	4.2
AFRICA	2.5	N.A.	0.9	1.6
LATIN AMERICA	1.9	1.3	1.3	0.5
COARSE GRAINS				
ASIA	1.8	2.2	-1.1	3.0
AFRICA	2.1	1.7	1.6	0.5
LATIN AMERICA	3.6	2.6	1.3	2.8

/A LEAST SQUARES TREND GROWTH RATES FOR 1961-80, END-POINT GROWTH RATES FOR 1980-95.

SOURCE: FAO, PRODUCTION YEARBOOK, VARIOUS ISSUES (ACTUAL); WORLD BANK (PROJECTIONS).

27. Considerable expansion of wheat, coarse grains, and even rice production is possible in the industrial countries, if warranted by global demand. Currently, agricultural policies in the United States and Canada, two of the largest wheat exporters, restrict wheat output in order to maintain farm prices and incomes. If world prices rise, as they did in 1972-74, acreage currently held out of production can be readily brought back into use; though

this response cannot be as great in terms of area as it was in the 1970s when there was a 20% increase in the area under wheat and coarse grains--land that farmers had been paid to hold out of production. Further, the livestock herds of these two countries may be regarded as an enormous bufferstock of grains. As grain prices rise livestock on feed falls thus releasing for export and human consumption quantities of grain formerly destined to be consumed by livestock. This indeed occurred during the 1972-73 crop shortfalls. Supply elasticities for wheat and coarse grains in the United States, Canada, the European Community and Australia indicate that the production response to increased price is quite elastic. Export supply elasticities are considerably larger than supply elasticities.

28. The grains projections have been based largely on a continuation of 1961-80 rates of growth of yields. Since many developing countries are mounting successful efforts to increase yields, it is believed that the yields assumptions used are conservative. Shown in Table 5 below are the historical rates of growth of production, area harvested and yield for the cereals, differentiated by main economic regions. Table 6 gives average 1970-80 yields for the grains by major regions. As the growth rates of area harvested and yield sum to the growth rate of production, the relative contribution of yield and area harvested to the changes in production that have occured can be easily inferred. World wheat yields have been growing at the rate of 2.5% p.a., implying that 80% of output growth during the 1961-80 period has been due to yield improvements. Wheat yields have been increasing most rapidly in developing countries, especially China (5.5% p.a.), yet yields in developing countries are still 40% below those of industrial countries.

TABLE 5: CEREALS - GROWTH /A IN PRODUCTION, AREA HARVESTED AND YIELDS, 1961-80

	PRODUCTION	AREA HARVESTED	YIELDS	SHARES IN WORLD PRODUCTION, 1980
	----------(% p.a.)----------			---(%)---
RICE				
INDUSTRIAL COUNTRIES	0.5	-0.6	1.1	5.1
CENTRALLY PLANNED ECONOMIES	1.8	0.0	1.8	5.1
DEVELOPING COUNTRIES	2.9	1.0	2.0	89.8
WORLD	2.7	0.9	1.8	
WHEAT				
INDUSTRIAL COUNTRIES	2.7	0.9	1.8	34.5
CENTRALLY PLANNED ECONOMIES	2.7	-0.6	3.3	28.7
DEVELOPING COUNTRIES	4.6	1.2	3.3	36.8
WORLD	3.4	0.6	2.8	
COARSE GRAINS				
INDUSTRIAL COUNTRIES	3.0	0.5	2.5	42.9
CENTRALLY PLANNED ECONOMIES	3.0	1.6	2.3	19.1
DEVELOPING COUNTRIES	2.4	2.2	2.4	38.0
WORLD	2.8	0.3	2.5	

/A LEAST SQUARES TREND GROWTH RATES.

SOURCE: DERIVED FROM FAO, PRODUCTION YEARBOOK, VARIOUS ISSUES.

TABLE 6: AVERAGE YIELDS FOR MAJOR CROPS IN REGIONS OF THE WORLD, 1970-80 AVERAGE

(KG/HA)

	WHEAT	RICE (PADDY)	COARSE GRAINS /A
WORLD OF WHICH:	1,771	2,576	1,993
INDUSTRIAL COUNTRIES	2,298	6,565	3,943
CENTRALLY PLANNED ECONOMIES	1,748	3,557	1,943
DEVELOPING COUNTRIES OF WHICH:	1,345	1,970	1,091
ASIA	1,523	2,541	1,261
AFRICA	1,024	1,773	882
LATIN AMERICA	1,456	1,834	1,631

/A COARSE GRAINS INCLUDE BARLEY, MAIZE, RYE, OATS, MILLET, SORGHUM.

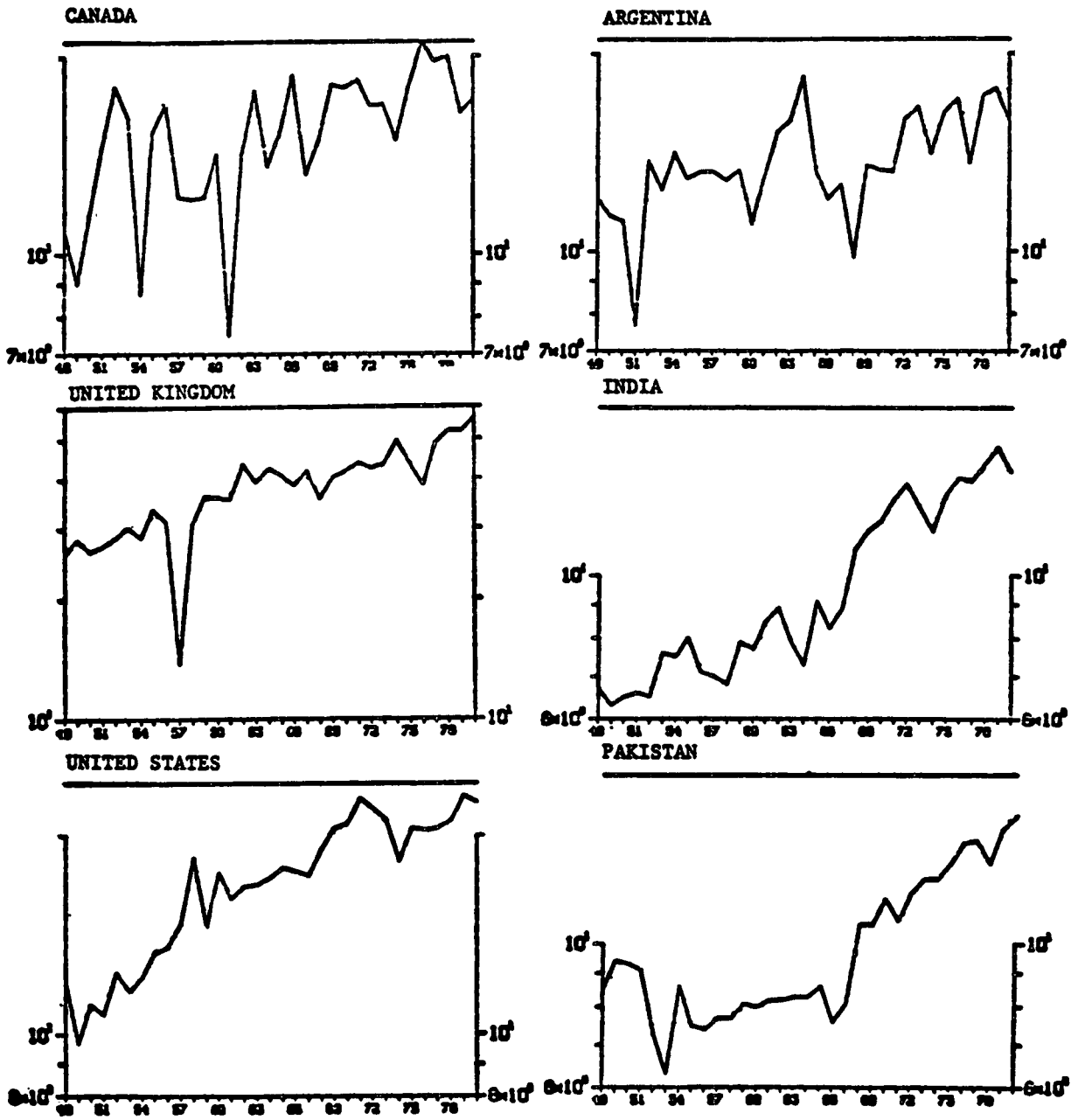
SOURCE: FAO, PRODUCTION YEARBOOK, VARIOUS ISSUES.

29. World yields of coarse grains have been growing at 2.3% p.a., implying that almost 90% of output growth has been due to yield increases. Coarse grains yields have been growing most rapidly in industrial countries as a rule, although again China has achieved very good yield increases in sorghum (5% p.a. for 1961-80). Two-thirds of the growth in the world production of rice in the past 20 years has been due to increases in yields. Over the last few years, rice yields in the United States have averaged 5,000 kilograms per hectare and in Japan 6,000 kilograms per hectare. The average for developing countries has been about 2,000 kilograms per hectare. Clearly there exists a great potential for "catching up."

30. Figures 6, 7 and 8 present yield growth rates in selected countries for wheat, rice and coarse grains over the past 32-year period. The vertical axis are logarithmic in order that yield data can be interpreted directly as growth in yields. The conclusions that can be drawn from these figures are that yields are increasing at a constant or diminishing rate in industrial countries while they are increasing at an increasing rate in developing countries. This is a very favorable indication of the future productive potential of developing countries; especially when the differences between yields in industrial countries and developing countries are considered. Even if developing countries never achieve yields of the same magnitude as industrial countries, merely approaching current yields in industrial countries would represent a substantial improvement and would have a significant effect on production. Since achieving yields similar to those now common in industrial countries involves adopting well-developed technologies, the technical challenge is not difficult. The main difficulty is an organizational one that involves providing correct incentives and removing obstacles to production increases.

FIGURE 6: WHEAT - YIELD GROWTH RATES IN SELECTED MAJOR PRODUCING COUNTRIES /A

('00 KG/HA)



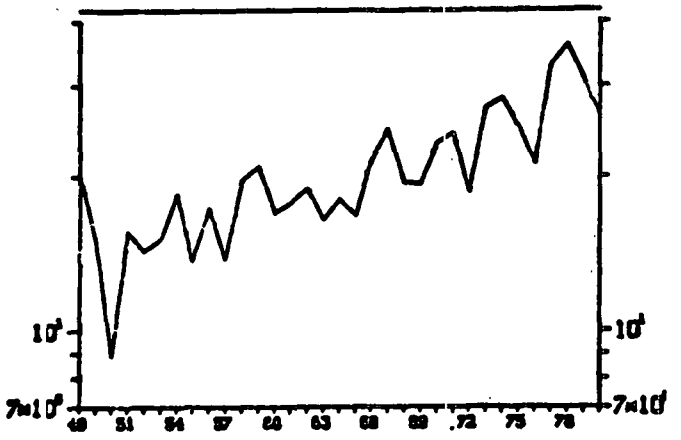
/A THE VERTICAL AXIS IS LOGARITHMIC SO THAT YIELD DATA ARE INTERPRETED DIRECTLY AS GROWTH IN YIELDS.

SOURCE: FAO, PRODUCTION YEARBOOK, VARIOUS ISSUES.

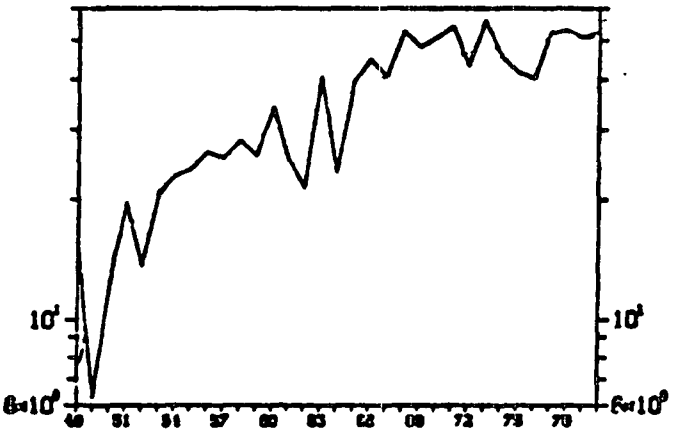
FIGURE 7: COARSE GRAINS - YIELD GROWTH RATES IN SELECTED PRODUCING COUNTRIES /A

('00 KG/HA)

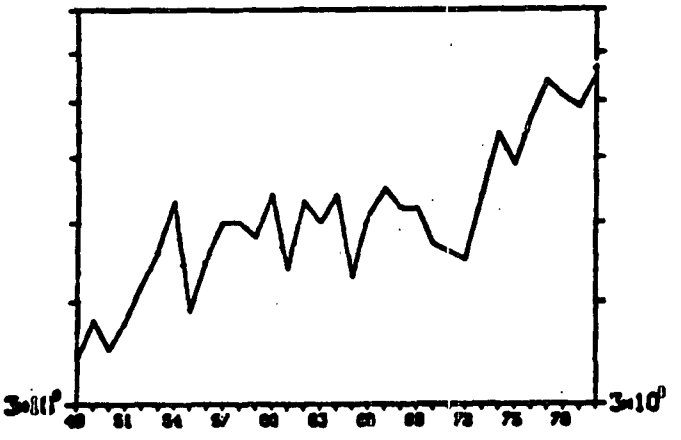
ARGENTINA : MAIZE



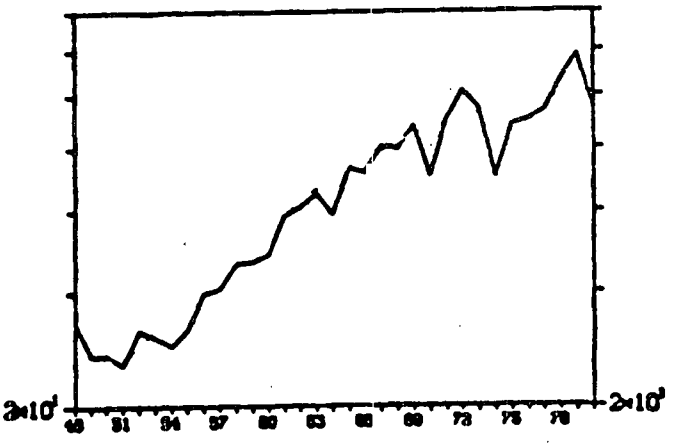
FRANCE : MAIZE



INDIA : SORGHUM



UNITED STATES : MAIZE

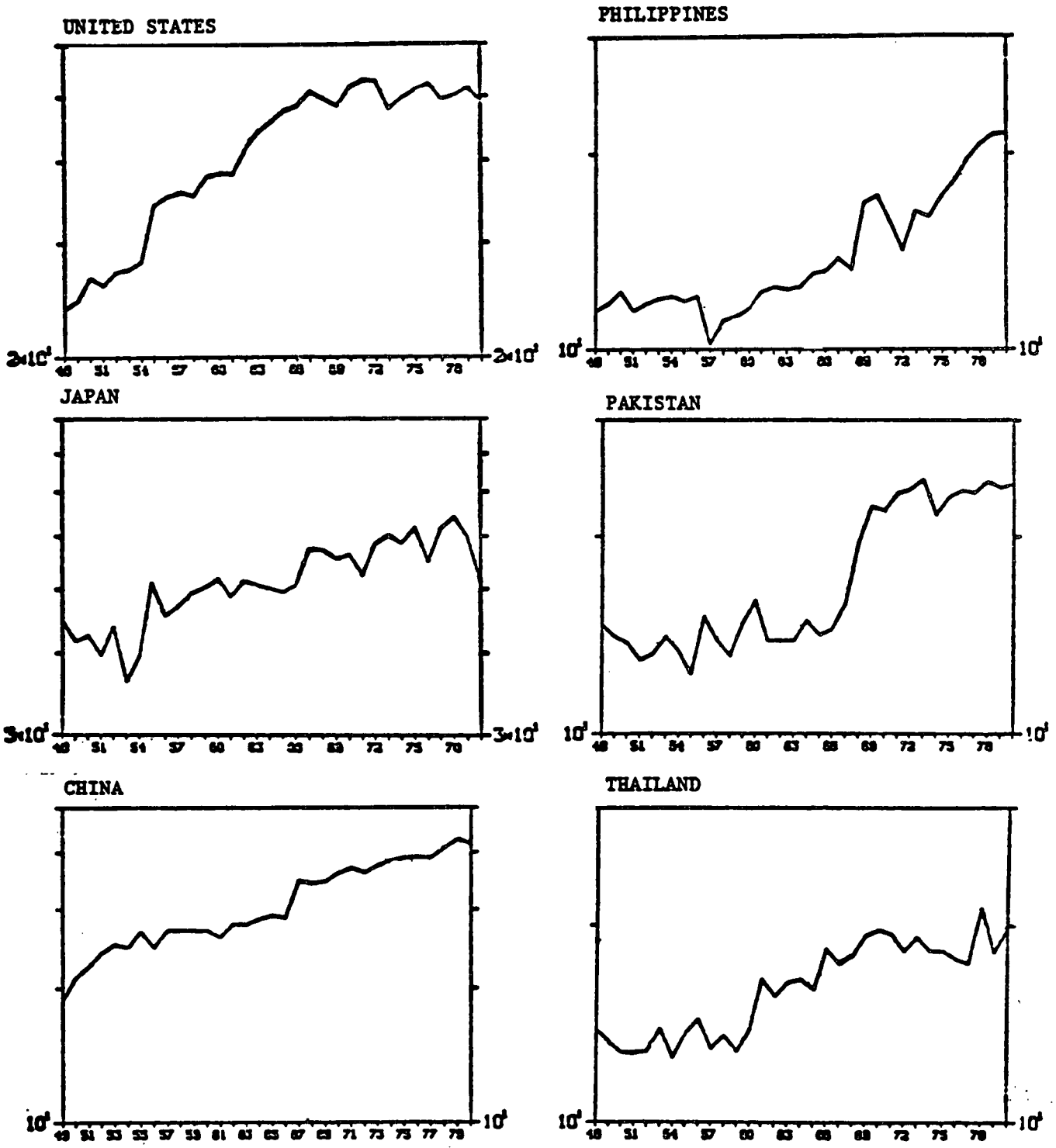


/A THE VERTICAL AXIS IS LOGARITHMIC SO THAT YIELD DATA IS INTERPRETED DIRECTLY AS GROWTH IN YIELDS.

SOURCE: FAO, PRODUCTION YEARBOOK, VARIOUS ISSUES.

FIGURE 8: RICE - YIELD GROWTH RATES IN MAJOR PRODUCING COUNTRIES /A

('00 KG/HA)



/A THE VERTICAL AXIS IS LOGARITHMIC SO THAT YIELD DATA ARE INTERPRETED DIRECTLY AS GROWTH IN YIELDS.

SOURCE: FAO, PRODUCTION YEARBOOK, VARIOUS ISSUES.

31. World wheat yields grew at an annual rate of 3.1% from 1961 to 1970, and at the much slower rate of 1.7% over the 1970-79 period. The slow growth in the 1970s was entirely due to almost negligible growth in Canada, the United States and the USSR. It is evident from Figure 6 that the 1970s saw some disturbing fluctuations in yields in the United States due to weather. There were sharp reductions in 1974 due to the cold, wet spring and early fall freeze, and in 1976-77 due to the extended drought. All three industrial countries shown in Figure 6 exhibit a slowing down in the historical growth of wheat yields. The sudden increase in the United Kingdom in the late 1970s probably represents the partial changeover from bread wheat to higher-yielding feed wheat. In many developing countries, as exemplified by the three examples in Figure 6, wheat yields are growing at an increasing rate. It is hard to see why there might be a sudden change from these recent trends.

32. In examining coarse grains' yields, it is important to split the total into maize and other coarse grains (where "other" include sorghum, millet, rye, oats and barley). There are large differences in production and yields between the other coarse grains and maize, which has received the bulk of research and development expenditures and which is more often irrigated than the other coarse grains. As a result, there has already been a substantial shift from sorghum and millet to the higher yielding maize. Maize production is now more than half of total coarse grains production.

33. The industrial countries have maize yields two to three times greater than those of the rest of the world, mainly as a result of greater irrigation and fertilizer inputs. The United States has, by far, the highest yields, producing over 6.5 tons of maize per hectare. This is twice the yields achieved in Argentina and four times the yields achieved in Brazil. Yields in the

centrally planned economies are only about half those of the United States. Yields in the United States, producer of about half the world's total, grew strongly in the 1961-80 period. Argentina, one of the more important developing country producers, recorded growth rates in maize yields during the 1970s of 4.4% p.a. However, growth in maize yields in the industrial countries has been slowing down while in the developing countries growth rates are still increasing (Figure 7).

34. Yields of other coarse grains are generally less than one-half of the yields of maize. Yields in the United States, the second largest producer, are around 2.5 tons per hectare. The USSR, the largest producer, has yields less than half those of the United States. France and Canada are other major industrial coarse grain producing countries. India, Argentina and Mexico are important developing country producers. Data on the other coarse grains generally show constant growth in industrial countries' yields, a sharp slowdown in growth in centrally planned economies' yield growth during the 1970s by comparison with the 1960s, and yields in the developing countries growing faster in the latter period (see, for example, India's sorghum yields in Figure 4).

35. In the United States and Japan, the only major industrial country rice producers, yields grew at an increasing rate throughout the 1950s and early 1960s, slowing down in the late 1960s, and growing at a constant rate during the 1970s (Figure 8). Recent yields (1978-80 average) of rice in the United States and Japan have been 5 and 5.8 tons per hectare, respectively, and in industrial countries yield increases have accounted for all of the production increases as area harvested has actually declined. The contrasting experience of developing countries is striking. In China and the Philippines, for example, and to a lesser extent in Thailand and Pakistan, growth rates of

yields are still increasing (Figure 8). In China, growth in yields has increased at a fairly steady rate over the last 30 years to 4.2 tons/ha in the period 1978-80. In the Philippines the rate of growth in yields since 1957 has been much greater than in China, but is still only 2.1 tons/ha. Yields over the period 1978-80 averaged 2.4 tons/ha in Pakistan and 2.0 tons/ha in Thailand. In Pakistan, growth in yields, after being stagnant during the 1950s and early 1960s, accelerated greatly during the late 1960s and early 1970s and has since flattened off; though yields are still increasing. Thailand displays a similiar pattern to Pakistan, though the changes have been more moderate than in Pakistan. Over the most recent decade, increasing yields in China and the Philippines have contributed to approximately 80% of the output increase, while in Pakistan and Thailand increasing yields have only contributed 57% and 39%, respectively, of the increased output. Considerable area expansion has taken place in the latter two countries.

Other Factors

36. The projections of food consumption to 1995 leave out some important components of the food basket, such as eggs, milk, vegetables and other meats. Besides changes in income, population and the income elasticity of demand for food, other factors affecting food consumption may also change over time. Two factors that could be important are the distribution of income and the age distribution of the population. Allowance was made in the above projections for changes in income elasticity of demand over time. However, these were the result of educated guesses. No allowance was made for change in income distribution and population distribution. We need to get a better idea of how income elasticities change with changes in income for different commodities and for this we need extensive time-series and cross-section studies. The age distribution of the population should also affect food consumption patterns, especially for commodities such as milk and meat. With developing countries

expected to experience some significant changes in population distribution as their population growth slows in the years ahead, there is also room for work on this aspect of demand.

37. As we noted earlier it is likely that within many developing countries growth in food consumption has been affected, negatively, by distorted prices and income distribution which is biased against the poor. From data assembled by the World Bank, nominal protection coefficients (NPCs) have been calculated for agricultural production in various countries. 1/ In Table 7 we have presented NPCs for 19 developing countries, calculated in most cases for the most important grain grown in each country. 2/ Bearing in mind the qualifications attached to these estimates, it is obvious that food production faces severe implicit or explicit taxes in many developing countries. It is our opinion that this factor has been the most important disincentive to the adoption of improved agricultural production performance in Africa, the region of most persistent concern about human nutrition, and that there would be a marked improvement if these disincentives were removed. And to reiterate, the pay-off to public investment in research and infrastructure designed to assist agriculture will not be as effective as it could be, so long as such distortions remain.

1/ The nominal protection coefficient measures the incentives or disincentives faced by producers by comparison with prices they would receive if there were free trade. The NPCs take account of tariffs, quotas and non-tariff barriers which protect farmers as well as export taxes or other restrictions that may penalize them. These NPC estimates are also adjusted for exchange rate under- or over-valuation, but they are not adjusted for the protection given to tradable inputs such as fertilizer or machinery. For an evaluation of the effects of such price distortions for several industrial and developing countries, in terms of income transfers and welfare reductions, see Bale and Lutz.

2/ For a larger set of NPC estimates refer to World Bank, 1982, pp. 48-9.

TABLE 7: NOMINAL PROTECTION COEFFICIENTS CALCULATED FOR GRAINS PRODUCTION IN DEVELOPING COUNTRIES

COUNTRY	GRAIN	NCP ESTIMATE /A
AFRICA		
EGYPT	MAIZE	0.67
IVORY COAST	RICE	0.97
KENYA	MAIZE	0.91
SENEGAL	RICE	0.70
SUDAN	SORGHUM	0.50
TANZANIA	MAIZE	0.13
TUNISIA	WHEAT	0.99
ZAMBIA	MAIZE	0.62
ASIA		
INDIA	RICE	0.65
PAKISTAN	WHEAT	0.76
PHILIPPINES	RICE	0.73
THAILAND	RICE	0.58
EUROPE		
TURKEY	WHEAT	0.94
YUGOSLAVIA	WHEAT	0.38
LATIN AMERICA		
ARGENTINA	WHEAT	0.64
BRAZIL	RICE	0.57
COLOMBIA	RICE	0.92
MEXICO	WHEAT	0.89
URUGUAY	WHEAT	1.25

/A A VALUE GREATER THAN 1.0 INDICATES A SUBSIDY ON PRODUCTION AND A VALUE LESS THAN 1.0 INDICATES A TAX. THESE ESTIMATES HAVE BEEN MADE AT DIFFERENT POINTS OF TIME AND NOW MAY WELL BE OUT OF DATE; MOREOVER, THE ESTIMATES DO VARY WIDELY FROM YEAR TO YEAR WITHIN A COUNTRY.

SOURCE: WORLD BANK, 1982.

38. World Bank and other estimates of Gini coefficients and other measures of income distribution suggest that incomes are generally much more unevenly distributed in developing countries than in industrial countries. A redistribution of incomes in these countries would certainly improve access to food supplies by the poor in those countries. However, we would not argue

therefore for massive redistribution programs. Our opinion is that improved pricing policies would, by encouraging agricultural production, raise the levels of incomes of farmers and landless rural people who rely on farming for their income. This would improve income distribution in favor of the sector in which most of the poor are found, more effectively than any direct intervention to change the distribution of incomes.

39. Two final points. The creation and development of a "world food system" that has occurred since World War II has greatly alleviated the possibility of widespread food shortages. At this time, virtually the entire population of the world has access to the world food markets. Vastly improved communications, lower surface and air transportation costs, the availability of shipping, the construction of storage facilities, and the development of infrastructure at dockside and in the hinterlands have all contributed to the creation of this complex. Food merchants receive worldwide market reports on a daily and sometimes hourly basis such that arbitrage opportunities largely equalize the price of food commodities across the world (net of transportation costs, government intervention activities, quality differences, and the like). Because of these developments it is now possible to eliminate food shortages caused by natural events. 1/

40. And finally, it is well-known that projections of economic behavior are notoriously unreliable (or are notoriously misinterpreted). All we know about the future is what we have observed in the past. We know that the future will be similar to the past because in the past the future has been similar to

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1/ D. Gale Johnson observed this development to one of the authors.

the past. Given this dictum we interpret the information provided here of over 30 years of declining agricultural prices and over 30 years of increasing crop yields (now increasing at an increasing rate in developing countries) as prima facie evidence of the robustness of the world food system and of the likely continuation of such trends. We feel that it is incumbent on those who view the global food situation in a pessimistic way to provide a strong case of why trends that have been in existence for at least thirty-five years will be suddenly reversed. While we are cautiously optimistic about the continued improvement of food consumption and food output throught the world, there is no room for complacency. As Johnson has observed, "if circumstances are to improve it is because efforts are made to make the improvement occur and at least some of the hinderences that exist, such as trade restrictions, low farm prices due to government constraints, and inadequate provision of farm inputs, are ameliorated.

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Describes a framework for systematically carrying out urban nutrition programs that examines several key considerations in nutrition education, on-site feeding, take-home feeding, nutrient-dense foods, ration shops, food coupons, fortification, direct nutrient dosage, and food processing and distribution.

The Johns Hopkins University Press, 1980. 136 pages.

LC 79-3705. ISBN 0-8018-2261-0, $6.50 (£4.50) paperback.

The Costs and Benefits of Family Planning Programs

George C. Zaidan

A technique for measuring the economic returns from investing in population control, with an appraisal of inherent assumptions and limitations.

The Johns Hopkins University Press, 1971. 62 pages (including bibliography).

LC 70-155166. ISBN 0-8018-1317-4, $4.00 (£2.40) paperback.

Demographic Aspects of Migration in West Africa —Volume 1

K. C. Zachariah and others

Background data on migration in four English-speaking countries: Ghana, Sierra Leone, Liberia, and The Gambia. A regional analysis based on these studies is presented in *Migration in West Africa: Demographic Aspects.*

World Bank Staff Working Paper No. 414. September 1980. vi + 363 pages (including statistical annexes, bibliography).

Stock No. WP-0414. $15.00.

Demographic Aspects of Migration in West Africa —Volume 2

K. C. Zachariah and others

Background data on migration in four French-speaking countries: Ivory Coast, Upper Volta, Senegal, and Togo. A regional analysis based on these studies is presented in *Migration in West Africa: Demographic Aspects.*

World Bank Staff Working Paper No. 415. September 1980. vi + 385 pages (including statistical annexes, bibliography).

Stock No. WP-0415. $15.00.

Economic Motivation versus City Lights: Testing Hypotheses about Inter-Changwat Migration in Thailand

Fred Arnold and Susan H. Cochrane

World Bank Staff Working Paper No. 416. September 1980. 41 pages (including footnotes, references).

Stock No. WP-0416. $3.00.

Economics of Supplemental Feeding of Malnourished Children: Leakages, Costs, and Benefits

Odin K. Knudsen

Analyzes some of the economic issues involved in the supplemental feeding of malnourished children. Demonstrates that supplemental feeding programs are economically justified if minimum improvements in mortality rates and more substantial increases in productivity take place.

World Bank Staff Working Paper No. 451. April 1981. iv + 76 pages.

Stock No. WP-0451. $3.00.

Experiments in Family Planning: Lessons from the Developing World

Roberto Cuca and Catherine S. Pierce

A comprehensive review of experimental efforts in the developing world to determine more effective ways of providing family planning services.

The Johns Hopkins University Press, 1978. 276 pages (including bibliography, index of experiments).

LC 77-16596. ISBN 0-8018-2013-8, $19.50 (£11.50) hardcover; ISBN 0-8018-2014-6, $8.95 (£4.00) paperback.

Family Planning Programs: An Evaluation of Experience
Roberto Cuca

World Bank Staff Working Paper No. 345. July 1979. xii + 134 pages (including 2 annexes, references).

Stock No. WP-0345. $5.00.

Fertility and Education: What Do We Really Know?
Susan H. Cochrane

A model identifying the many channels through which education might act to determine fertility and a review of the evidence of the relation between education and the intervening variables in the model that affect fertility.

The Johns Hopkins University Press, 1979. 188 pages (including bibliography, index).

LC 78-26070. ISBN 0-8018-2140-1, $6.95 (£4.75) paperback.

Fertility and Its Regulation in Bangladesh
R. Amin and
Rashid Faruqee

World Bank Staff Working Paper No. 383. April 1980. iv + 50 pages (including references).

Stock No. WP-0383. $3.00.

NEW

Food Distribution and Nutrition Intervention: The Case of Chile
Lloyd Harbert and
Pasquale L. Scandizzo

The impact of Chile's Complementary Feeding Program (CFP), both on the direct and indirect beneficiaries, is analyzed. Describes Chile's major nutrition intervention programs and establishes the relative importance of the CFP in terms of budgetary expenditures and number of beneficiaries reached. Reviews briefly the programs past limitations, recent reforms, and potential effectiveness.

World Bank Staff Working Paper No. 512. May 1982. v + 45 pages (including bibliography, annex).

ISBN 0-8213-0001-6. $3.00.

Health
Fredrick Golladay, coordinating author

Draws on experience gained from health components of seventy World Bank projects in forty-four countries between 1975 and 1978. Emphasizes the disproportionately high expenditures incurred on curative medicine, maintenance of expensive hospitals, and sophisticated training of medical personnel at the cost of preventive care for the majority of the people. Points out that low-cost health care systems are feasible and recommends that the Bank begin regular and direct lending for health, in addition to having health components as part of projects in other sectors.

Sector Policy Paper. February 1980. 90 pages (including 8 annexes, 4 figures, map). English, French, Japanese, Spanish, and Arabic.

Stock Nos. PP-8001-E, PP-8001-F, PP-8001-J, PP-8001-S, PP-8001-A. $5.00.

Health Issues and Policies in the Developing Countries
Fredrick Golladay

World Bank Staff Working Paper No. 412. August 1980. ii + 53 pages.

Stock No. WP-0412. $3.00.

NEW

Health, Nutrition, and Family Planning in India: A Survey of Experiments and Special Projects
Rashid Faruqee and
Ethna Johnson

Surveys fourteen experiments and special projects in health, nutrition, and family planning in India and proposes guidelines for future Bank projects on the basis of the survey.

World Bank Staff Working Paper No. 507. February 1982. xi + 97 pages (including references).

Stock No. WP-0507. $5.00.

NEW

Integrating Family Planning with Health Services: Does It Help?
Rashid Faruqee

Analyzes the findings of an experiment carried out in Narangwal, a village in Punjab, India, between 1968 and 1974 related to health care and family planning. The World Bank collaborated with The Johns Hopkins University in analyzing this data from one of the best known and well-documented field experiments in health care and family planning in the world.

World Bank Staff Working Paper No. 515. September 1982. 47 pages.

ISBN 0-8213-0003-2. $3.00.

Kenya: Population and Development

(See description under *Country Studies* listing.)

Malnourished People: A Policy View

(See description under *Development* listing.)

Malnutrition and Poverty: Magnitude and Policy Options
Shlomo Reutlinger and
Marcelo Selowsky

The first large research effort in the World Bank to determine the global dimension of malnutrition.

The Johns Hopkins University Press, 1976; 2nd printing, 1978. 94 pages (including 5 appendixes).

LC 76-17240. ISBN 0-8018-1868-0, $4.75 (£2.85) paperback.

Spanish: Desnutrición y pobreza: magnitudes y opciones de política. *Editorial Tecnos, 1977.*

ISBN 84-309-0726-2, 380 pesetas.

Measuring Urban Malnutrition and Poverty: A Case Study of Bogota and Cali, Colombia
Rakesh Mohan,
M. Wilhelm Wagner,
and Jorge Garcia

Attempts to measure the extent of malnutrition and poverty in the cities of Bogota and Cali, Colombia. One

of five papers resulting from a research program entitled "City Study," a study of the workings of five major urban sectors in Colombia.

World Bank Staff Working Paper No. 447. April 1981. 80 pages (including bibliography, appendixes).

Stock No. WP-0447. $3.00.

Migration in West Africa: Demographic Aspects

K. C. Zachariah and Julien Condé

The first study of the large-scale movement of people in nine West African countries. Discusses the volume and direction of internal and external flows and the economic and social characteristics of migrants.

A joint World Bank-OECD study. Oxford University Press, 1981. 166 pages (including 22 maps, bibliography, index).

LC 80-21352. ISBN 0-19-520186-8, $19.95 (£10.50) hardcover; ISBN 0-19-520187-6, $8.95 (£4.50) paperback.

Nutrition and Food Needs in Developing Countries

Odin K. Knudsen and Pasquale L. Scandizzo

World Bank Staff Working Paper No. 328. May 1979. 73 pages (including 4 appendixes).

Stock No. WP-0328. $3.00.

Population and Poverty in the Developing World

Nancy Birdsall

World Bank Staff Working Paper No. 404. July 1980. 96 pages (including 2 appendixes, bibliography).

Stock No. WP-0404. $3.00.

Population Policies and Economic Development

Timothy King and others

The English-language edition is out of print.

Spanish: Políticas de población y desarrollo económico. *Editorial Tecnos, 1975.*

ISBN 84-309-0605-3, 440 pesetas.

Population Policy and Family Planning Programs: Trends in Policy and Administration

Kandiah Kanagaratnam and Catherine S. Pierce

World Bank Staff Working Paper No. 411. August 1980. iii + 22 pages (including footnotes).

Stock No. WP-0411. $3.00.

Regional Aspects of Family Planning and Fertility Behavior in Indonesia

Dov Chernichovsky and Oey Astra Meesook

Discusses the recent decline in Indonesia's population growth rate despite that country's relatively low level of income and socioeconomic development. Reviews the history and organization of the family planning program and attempts to identify those factors that have been responsible for its success and assesses its prospects for the future.

World Bank Staff Working Paper No. 462. May 1981. 62 pages (including appendix, references).

Stock No. WP-0462. $3.00.

REPRINTS

Health Care in the Developing World: Problems of Scarcity and Choice (Shattuck Lecture)

John R. Evans, Karen Lashman Hall, and Jeremy J. Warford

World Bank Reprint Series: Number 209. Reprinted from New England Journal of Medicine, *vol. 305 (November 1981):1117-27.*

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Measurement of Deprivation and Poverty Based on the Proportion Spent on Food: An Exploratory Exercise

V.V. Bhanoji Rao

World Bank Reprint Series: Number 193. Reprinted from World Development, *vol. 9, no. 4 (1981):337-53.*

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Nutrition, Health, and Education: The Economic Significance of Complementarities at Early Age

Marcelo Selowsky

World Bank Reprint Series: Number 218. Reprinted from Journal of Development Economics, *vol. 9 (1981):331-46.*

Stock No. RP-0218. Free of charge.

World Bank Publications of Related Interest

Adoption of Agricultural Innovations in Developing Countries: A Survey

Gershon Feder, Richard Just, and David Silberman

Reviews various studies that have provided a description of and possible explanation for patterns of innovation adoption in the agricultural sector.

World Bank Staff Working Paper No. 542. 1982. 65 pages.

ISBN 0-8213-0103-9. $3.00.

Agrarian Reform as Unfinished Business—the Selected Papers of Wolf Ladejinsky

Louis J. Walinsky, editor

Studies in agrarian policy and land reform spanning four decades, grouped chronologically according to Ladejinsky's years in Washington, Tokyo, and Vietnam and while at the Ford Foundation and the World Bank.

Oxford University Press, 1977. 614 pages (including appendixes, index).

LC 77-24254. ISBN 0-19-920095-5, $32.50 (£14.95) hardcover; ISBN 0-19-920098-X, $14.95 (£5.25) paperback.

Agrarian Reforms in Developing Rural Economies Characterized by Interlinked Credit and Tenancy Markets

Avishay Braverman and T. N. Srinivasan

World Bank Staff Working Paper No. 433. October 1980. 32 pages (including references).

Stock No. WP-0433. $3.00.

Agricultural Credit

Outlines agricultural credit practices and problems, programs, and policies in developing countries and discusses their implications for World Bank operations.

A World Bank Paper. May 1975. 85 pages (including 14 annex tables). English, French, and Spanish.

Stock Nos. PP-7502-E, PP-7502-F, PP-7502-S. $5.00 paperback.

The Agricultural Economy of Northeast Brazil

Gary P. Kutcher and Pasquale L. Scandizzo

This study, based on an agricultural survey of 8,000 farms, assesses the extent and root causes of pervasive rural poverty in northeast Brazil. The authors review a number of policy and project options; they conclude that courageous land reform is the only effective means of dealing with the problem.

The Johns Hopkins University Press, 1982. 288 pages.

LC 81-47615. ISBN 0-8018-2581-4, $25.00 (£17.50) hardcover.

Agricultural Extension: The Training and Visit System

Daniel Benor and James Q. Harrison

Describes the Training and Visit System of extension developed by Daniel Benor and introduced in a number of projects assisted by the World Bank in developing countries.

May 1977. 55 pages (including annex). English, French, and Spanish.

Stock Nos. PM-7701-E, PM-7701-F, PM-7701-S. $3.00 paperback.

Agricultural Land Settlement

Theodore J. Goering, coordinating author

Examines selected issues related to the World Bank's lending for land settlement, and gives estimates of the global rate of settlement and the world's ultimate potentially arable land.

A World Bank Issues Paper. January 1978. 73 pages (including 4 annexes). English, French, and Spanish.

Stock Nos. PP-7801-E, PP-7801-F, PP-7801-S. $5.00 paperback.

Agricultural Price Management in Egypt

William Cuddihy

World Bank Staff Working Paper No. 388. April 1980. x + 164 pages (including annex, bibliography).

Stock No. WP-0388. $5.00.

Agricultural Price Policies and the Developing Countries

George Tolley, Vinod Thomas, and Chung Ming Wong

This book first considers price policies in Korea, Bangladesh, Thailand, and Venezuela, bringing out the consequences for government cost and revenue, farm income, and producer and consumer welfare. Other effects, including those on agricultural diversification, inflation, economic growth, and the balance of payments are also discussed. The second part of the book provides a methodology for estimating these effects in any country. Operational tools for measuring the effects on producers, consumers, and government are developed and applied.

The Johns Hopkins University Press, 1982. 256 pages.

LC 81-15585. ISBN 0-8018-2704-3, $25.00 (£17.50) hardcover.

Agricultural Project Analysis: Case Studies and Exercises

Case studies and exercises on agricultural project preparation and analysis, developed for, and used in, EDI's rural development and rural credit courses.

World Bank (EDI), 1979, v.1—viii + 711 pages. v.2—iv + 113 pages. v.3—iv + 157 pages. (Available from ILS, 1715 Connecticut Avenue, N.W., Washington, D.C. 20009, U.S.A.)

$9.00 paperback.

Agricultural Research

Points out that developing countries must invest more in agricultural research if they are to meet the needs of their growing populations. States that studies in Brazil, India, Japan, Mexico, and the United States show that agricultural research yields a rate of return that is more than two to three times greater than returns from most alternative investments and cites some of the successes of the high-yielding varieties of rice and

wheat that were developed in the mid-1960s. Discusses the World Bank's plans to expand its lending for agricultural research and extension, particularly for the production of food and other commodities that are of importance to low-income consumers, small farmers, and resource-poor areas.

Sector Policy Paper. June 1981. 110 pages (including annexes). English, French, and Spanish.

Stock No. PP-8101-E, PP-8101-F, PP-8101-S. $5.00 paperback.

A Development Model for the Agricultural Sector of Portugal

Alvin C. Egbert
and Hyung M. Kim

Spatial mathematical programming is used to develop comprehensive and quantitative methods to suggest development strategies in Portugal's agriculture sector.

The Johns Hopkins University Press, 1975. 110 pages (including bibliography).

LC 75-26662. ISBN 0-8018-1793-5, $6.50 (£4.00) paperback.

Economic Aspects and Policy Issues in Groundwater Development

Ian Carruthers and Roy Stoner

Examines a wide range of economic and policy issues related to development of groundwater for irrigation.

World Bank Staff Working Paper No. 496. October 1981. 110 pages (including annex, bibliography).

Stock No. WP-0496. $5.00.

NEW

Economic Return to Investment in Irrigation in India

Leslie A. Abbie,
James Q. Harrison,
and John W. Wall

Reports on an investigation into the efficiency of investment in surface and groundwater irrigation in India.

World Bank Staff Working Paper No. 535. 1982. 52 pages.

ISBN 0-8213-0083-0. $3.00.

Farm Budgets: From Farm Income Analysis to Agricultural Project Analysis

Maxwell L. Brown

Clarifies the relation between simple farm income analysis and the broader field of agricultural project analysis and emphasizes the more practical aspects of project preparation and gives guidance to those responsible for planning in agriculture.

EDI Series in Economic Development. The Johns Hopkins University Press, 1980. 154 pages.

LC 79-3704. ISBN 0-8018-2386-2, $15.00 (£10.50) hardcover; ISBN 8-8018-2387-0, $6.50 (£4.50) paperback.

Spanish: Presupuestos de fincas. *Editorial Tecnos, 1982.*

ISBN 84-309-0886-2, 725 pesetas.

Fishery

Highlights the importance of fisheries to the economies of developing countries and recommends that the World Bank provide assistance to those countries that have the fishery resources and are willing to develop them further.

Sector Policy Paper. December 1982.

ISBN 0-8213-0138-1. $5.00 paperback.

Food Security in Food Deficit Countries

Shlomo Reutlinger
and Keith Knapp

World Bank Staff Working Paper No. 393. June 1980. 39 pages (including appendix, references).

Stock No. WP-0393. $3.00.

Forestry

Graham Donaldson, coordinating author

Examines the significance of forests in economic development and concludes that the World Bank should greatly increase its role in forestry development, both as a lender and adviser to governments.

Sector Policy Paper. February 1978. 63 pages (including 7 annexes). English, French, and Spanish.

Stock Nos. PP-7804-E, PP-7804-F, PP-7804-S. $5.00 paperback.

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Improving Irrigated Agriculture: Institutional Reform and the Small Farmer

Daniel W. Bromley

A model of farmer interdependence is developed to provide suggestions for improving existing irrigation systems, as well as for designing new ones.

World Bank Staff Working Paper No. 531. 1982. 96 pages.

ISBN 0-8213-0064-4. $3.00.

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Increasing Agricultural Productivity

(Proceedings of the Third Annual Agricultural Sector Symposium)

Ted J. Davis, editor

These proceedings are the third in a series of records of Agricultural Sector Symposia presented at the World Bank each January since 1980. Contains the papers presented by the speakers, chairpersons' statements, and summaries of the discussions prepared by the rapporteurs.

1982. 307 pages (including index). ISBN 0-8213-0099-7. $15.00.

NEW

India: Demand and Supply Prospects for Agriculture

James Q. Harrison,
Jon A. Hitchings,
and John W. Wall

Contains four papers that report on the World Bank's economic work in the agricultural sector in India and the implications of this development both for foodgrains and for other major agricultural commodities. Focuses on the demand for agricultural commodities through the year 2000, the foodgrain economy, the vegetable oil economy, and the sugar economy.

World Bank Staff Working Paper No. 500. October 1981. 133 pages (including 5 appendixes, references, annex).

Stock No. WP-0500. $5.00.

Agricultural Research and Productivity

Robert E. Evenson and Yoav Kislev

Examines the role of scientific research and technological change in increasing agricultural productivity.

Yale University Press, 302 Temple Street, New Haven, Connecticut 06520, U.S.A. 1975. xi + 204 pages (including 10 appendixes, references, index).

LC 74-15210. ISBN 0-300-01815-0, $15.00 hardcover; ISBN 0-300-01877-0, $3.95 paperback.

Spanish: Investigación agrícola y productividad. *Editorial Tecnos, 1976.*

ISBN 84-309-0641-X, 420 pesetas.

Agroindustrial Project Analysis

James E. Austin

Provides and illustrates a framework for analyzing and designing agroindustrial projects.

EDI Series in Economic Development. The Johns Hopkins University Press, 1981. 224 pages (including appendixes, bibliography, and index).

LC 80-550. ISBN 0-8018-2412-5, $16.50 (£10.00) hardcover; ISBN 0-8018-2413-3, $7.50 (£4.25) paperback.

French: L'Analyse des projets agro-industriels. Economica, 1982.

ISBN 2-7178-0480-3, 49 francs.

Spanish: Análisis de proyectos agroindustriales. *Editorial Tecnos, 1981.*

ISBN 84-309-0882-X, 600 pesetas.

Argentina: Country Case Study of Agricultural Prices, Taxes, and Subsidies

Lucio G. Reca

World Bank Staff Working Paper No. 386. April 1980. 72 pages (including 3 annexes).

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The Book of CHAC: Programming Studies for Mexican Agricultural Policy

Edited by Roger D. Norton and Leopoldo Solís M.

The principal tool of analysis is the sector model CHAC, named after the Mayan rain god. This model can be used throughout the sector to cover short-cycle crops, their inputs, and their markets. It can also be broken down into submodels for particular localities if more detailed analysis is required. The model helps planners weigh the costs among policy goals, which can vary from region to region. This volume reports the experience of using the CHAC model and also presents purely methodological material.

The Johns Hopkins University Press, 1983. 632 pages.

LC 80-29366. ISBN 0-8018-2585-7, $35.00 (£24.50) hardcover.

NEW

Building National Capacity to Develop Water Users' Associations: Experience from the Philippines

Frances F. Korten

Over a five-year period, the National Irrigation Administration (NIA) of the Philippines has been building its capacity to develop water users associations on small-scale irrigation systems. This paper details the changes that have been made within the agency as a result of the development of these associations prior to the construction of the physical system and the involvement of association members in the planning and construction stages. It also examines the nature of the learning process that has led to these changes and discusses the implications for donor support of other small-scale irrigation programs and more generally for programs involving village-level work.

World Bank Staff Working Paper No. 528. July 1982. v + 69 pages (including references).

ISBN 0-8213-0051-2. $3.00.

Casos y Ejercicios Sobre Proyectos Agrícolas

Edited by Orlando T. Espadas

Three case studies prepared in conjunction with the EDI's Agricultural Projects Courses in Spanish and intended primarily for teachers of project analysis.

World Bank (EDI), March 1974; revised January 1975. 480 pages (Available from ILS, 1715 Connecticut Avenue, N.W., Washington, D.C. 20009, U.S.A.)

$5.00 paperback.

The Design of Organizations for Rural Development Projects—a Progress Report

William E. Smith, Francis J. Lethem, and Ben A. Thoolen

World Bank Staff Working Paper No. 375. March 1980. 48 pages. English and French.

Stock No. WP-0375-E, WP-0375-F. $3.00.

The Design of Rural Development: Lessons from Africa

Uma Lele

Analyzes new ways of designing rural development projects to reach large numbers of low-income subsistence populations. The paperback reprinting in 1979 contains a new chapter by the author updating her findings.

The Johns Hopkins University Press, 1975; 3rd printing, 1979. 260 pages (including glossary, appendix, maps, bibliography, index).

ISBN 0-8018-1769-2, $9.95 paperback.

French: Le développement rural: l'expérience Africaine. *Economica, 1977.*
ISBN 2-7178-0006-9, 39 francs.

Land Reform

Examines the characteristics of land reform, its implications for the economies of developing countries, and the major policy options open to the World Bank in this field.

A World Bank Paper. May 1975. 73 pages (including 2 annexes). English, French, and Spanish.

Stock Nos. PP-7503-E, PP-7503-F, PP-7503-S. $5.00 paperback.

Land Tenure Systems and Social Implications of Forestry Development Programs

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World Bank Staff Working Paper No. 452. April 1981. 35 pages (including references, bibliography).

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Managing Information for Rural Development: Lessons from Eastern Africa

Guido Deboeck and Bill Kinsey

World Bank Staff Working Paper No. 379. March 1980. vii + 70 pages (including 5 annexes, index).

Stock No. WP-0379. $3.00.

Measuring Project Impact: Monitoring and Evaluation in the PIDER Rural Development Project—Mexico

Michael M. Cernea

World Bank Staff Working Paper No. 332. June 1979. vi + 131 pages (including 3 annexes, appendix, map).

Stock No. WP-0332. $5.00.

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Monitoring and Evaluation of Agriculture and Rural Development Projects

Dennis J. Casley and Denis A. Lury

This book provides a how-to tool for the design and implementation of monitoring and evaluation systems in rural development projects. Because rural development projects are complex, they seek to benefit large numbers of people in remote rural areas, and they involve a variety of investments. The need for monitoring and evaluating them during implementation has been accepted in principle, but effective systems have not heretofore been formulated. The concepts of monitoring and evaluation are differentiated and issues that need to be considered in designing systems to monitor and evaluate specific projects are outlined, emphasizing the timeliness of the monitoring functions for effective management. Elaborates on such technical issues as selection of indicators, selection of survey methodology data analysis, and presentation. It is directed primarily to those working with specific projects and will be useful to project appraisal teams, to designers of monitoring and evaluation systems, and to project staff who work with these systems.

The Johns Hopkins University Press. 1982. 145 pages. French and Spanish forthcoming.

LC 82-7126. ISBN 0-8018-2910-0, $8.50 (£6.50) paperback.

Monitoring Rural Development in East Asia

Guido Deboeck and Ronald Ng

World Bank Staff Working Paper No. 439. October 1980. 91 pages (including annexes).

Stock No. WP-0439. $3.00.

Nutritional Consequences of Agricultural Projects: Conceptual Relationships and Assessment Approaches

Per Pinstrup-Andersen

World Bank Staff Working Paper No. 456. April 1981. 93 pages (including bibliography, appendix).

Stock No. WP-0456. $3.00.

Prices, Taxes, and Subsidies in Pakistan Agriculture, 1960–1976

Carl Gotsch and Gilbert Brown

World Bank Staff Working Paper No. 387. April 1980. 108 pages.

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Rethinking Artisanal Fisheries Development: Western Concepts, Asian Experiences

Donald K. Emmerson

World Bank Staff Working Paper No. 423. October 1980. x + 97 pages (including references).

Stock No. WP-0423. $5.00.

Rural Development

Discusses strategy designed to extend the benefits of development to the rural poor and outlines the World Bank's plans for increasing its assistance in this sector.

Sector Policy Paper, February 1975, 89 pages (including 14 annexes). English, French, Spanish, and Arabic.

Stock Nos. PP-7501-E, PP-7501-F, PP-7501-S, PP-7501-A. $5.00 paperback.

Rural Poverty Unperceived: Problems and Remedies

Robert Chambers

World Bank Staff Working Paper No. 400. July 1980. 51 pages (including references).

Stock No. WP-0400. $3.00.

Rural Projects Through Urban Eyes: An Interpretation of the World Bank's New-Style Rural Development Projects

Judith Tendler

This paper describes the Bank's new-style rural development projects, including some of the things that happen in the political environment of a project when governments, assisted by the Bank, redirect their public-sector services and subsidies to the rural poor.

World Bank Staff Working Paper No. 532. 1982. 100 pages.

ISBN 0-8213-0028-8. $3.00.

Sociocultural Aspects of Developing Small-Scale Fisheries: Delivering Services to the Poor

Richard B. Pollnac

World Bank Staff Working Paper No. 490. October 1981. iii + 61 pages (including references).

Stock No. WP-0490. $3.00.

Some Aspects of Wheat and Rice Price Policy in India
Raj Krishna and G. S. Raychaudhuri

World Bank Staff Working Paper No. 381. April 1980. 62 pages (including 2 appendixes, 6 tables, bibliography).

Stock No. WP-0381. $3.00.

A System of Monitoring and Evaluating Agricultural Extension Projects
Michael M. Cernea and Benjamin J. Tepping

World Bank Staff Working Paper No. 272. December 1977. vi + 115 pages (including 9 annexes, bibliography).

Stock No. WP-0272. $5.00.

Thailand—Case Study of Agricultural Input and Output Pricing
Trent Bertrand

World Bank Staff Working Paper No. 385. April 1980. ix + 134 pages (including 2 appendixes).

Stock No. WP-0385. $5.00.

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Adoption of Interrelated Agricultural Innovations: Complementarity and the Impacts of Risk, Scale, and Credit
Gershon Feder

World Bank Reprint Series: Number 206. Reprinted from American Journal of Agricultural Economics, *vol. 64, no. 1 (February 1982):94-101.*

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World Bank Reprint Series: Number 191. Reprinted from The Journal of Policy Modeling, *vol. 1, no. 2 (May 1979):217-34.*

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Michael M. Cernea

World Bank Reprint Series: Number 196. Reprinted from Extension Education and Rural Development, *vol. 2. (1981):221-35, 281.*

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