the state of food and agriculture 1972

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

SPECIAL CHAPTERS

In addition to the usual review of the recent world food and agriculture situation, each issue of this report from 1957 has included one or more special studies of problems of longer term interest. Special chapters in earlier issues have covered the following subjects:

1957	Factors influencing the trend of food consumption
	Postwar changes in some institutional factors affecting agriculture
1958	Food and agricultural developments in Africa south of the Sahara
	The growth of forest industries and their impact on the world's forests
1959	Agricultural incomes and levels of living in countries at different stages of economic development
	Some general problems of agricultural development in less developed countries in the light of postwar experience
1960	Programing for agricultural development
1961	Land reform and institutional change
	Agricultural extension, education and research in Africa, Asia and Latin America
1962	The role of forest industries in the attack on economic underdevelopment
	The livestock industry in less developed countries
1963	Basic factors affecting the growth of productivity in agriculture
	Fertilizer use: spearhead of agricultural development
1964	Protein nutrition: needs and prospects
	Synthetics and their effects on international trade
1966	Agriculture and industrialization
	Rice in the world food economy
1967	Incentives and disincentives for farmers in developing countries
	The management of fishery resources
1968	Raising agricultural productivity in developing countries through technological improvement
	Improved storage and its contribution to world food supplies
1969	Agricultural marketing improvement programmes: some lessons from recent experience
	Modernization of institutions to promote development
1970	Agriculture at the threshold of the Second Development Decade
1971	Water pollution and its effects on living aquatic resources and fisheries

THE STATE OF FOOD AND AGRICULTURE 1972

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WORLD REVIEW

REVIEW BY REGIONS

EDUCATION AND TRAINING FOR DEVELOPMENT

ACCELERATING AGRICULTURAL RESEARCH IN THE DEVELOPING COUNTRIES

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 1972

The statistical material in this publication has been prepared from the information available to FAO up to 1 October 1972

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NOTE

The following symbols are used in statistical tables:

— none or negligible

... not available

1970/71 signifies a crop, marketing or fiscal year running from one calendar year to the next. 1970-71 signifies the average for two calendar years.

Figures in statistical tables may not add up because of rounding. Percent changes from one year to another have been calculated from unrounded figures.

Unless otherwise indicated, the metric system is used throughout. For explanation of the coverage and methods of calculating the FAO index numbers of agricultural production and international trade in agricultural products, see the explanatory note to the Annex tables.

FOREWORD

Because 1971 was the first year of the Second United Nations Development Decade, the performance of the world's agriculture must inevitably be assessed against the targets set by the international community for this period. Unfortunately it was not a particularly good year for the agricultural sector in the developing countries. That world production maintained its long-term annual increase of about 3 percent was due to substantial expansions in the developed countries, where incomes are relatively high and nutrition generally adequate. In the developing countries the rise in production was between 1 and 2 percent, which is much less than in recent years and well below the target of the Second Development Decade of an average annual increase of 4 percent. For 1972, preliminary information suggests that no acceleration has occurred in this rate of increase.

Satisfactory production increases were achieved in Africa and the Near East. In the Far East, where encouragingly large gains have been achieved in recent years, the 1971 production increase was disappointing, partly as a result of the hostilities in Bangladesh. However, India, the most populous country of that heavily populated region, had a comparatively good year (although not as good as some of the immediately preceding ones), and its foodgrain stocks have now been built up to a most satisfactory level. The Latin American region had little if any increase in agricultural production in 1971, owing to adverse weather in Argentina and Cuba.

In assessing the performance of agriculture, the events of a single season of course mean very little. The "seven lean years and seven fat years" are as old as history. Undoubtedly most of the production setback in the developing countries in 1971 can be attributed to adverse weather or to civil disturbances, and we in FAO have also learned that the revisions to our preliminary production indices are frequently upward. But for each year that is below average, a better than average one is needed to get back on the trend, while what is hoped for in the Second Development Decade is a good deal better than the recent trend. Thus, even if the performance of agriculture in the developing countries is much better in 1972, it will be necessary to reconsider very seriously whether government policies in the developing countries themselves and among the major aid donors are adequate to achieve the targets of the Second Development Decade. Although in Asia, for example, the full possibilities of the high-yielding cereal varieties are undoubtedly still very far from being exhausted, it may be that we are reaching the end of the period of easy gains (in the climatically favoured areas, with large modern farms, etc.), and that for future progress much greater efforts will be needed, in particular to extend the new technology to the millions of small farmers. Price policies may also require rethinking in some countries.

In respect of agricultural export earnings, too, the developing countries did significantly worse in 1971 than the year before, when exceptional factors had raised these earnings well above the longer term trend. The developing countries suffered not only a further decline in their share of world agricultural exports, but also a fall in absolute terms in agricultural export earnings.

The third United Nations Conference on Trade and Development (UNCTAD), held in Santiago in April and May 1972, clearly demonstrated how wide is the gap in understanding between developed and developing countries concerning many important aspects of trade, aid and development. The small progress that was achieved included agreement that UNCTAD should assist the developing countries in their participation in the 1973 trade negotiations under the General Agreement on Tariffs and Trade (GATT), and that special modalities should be established to ensure particular attention to their interests in these negotiations. Other agreed proposals included the need for the participation of developing countries in international monetary consultations and further study by the International Monetary Fund of the proposed link between special drawing rights and development finance. It was agreed to investigate the feasibility of a special fund to finance measures in favour of the least developed countries, and FAO is already studying the special needs and problems of these countries.

It is in the context of the complex of problems discussed at the third UNCTAD meeting that, as I described at some length in my foreword to the 1971 issue of this report, I

proposed to the 1971 session of the FAO Conference that the main theme of its next session in 1973 should be international agricultural adjustment. I believe that the studies now under way in preparation for these discussions will help to set out clearly the issues involved in achieving a better balance of world agricultural production and trade.

While there were also differences in approach between developed and developing countries at the United Nations Conference on the Human Environment, held in Stockholm in June 1972, this conference did succeed in achieving a broad consensus on a number of vital matters. As the first world meeting of its kind, it represented an important step in the conscious recognition by mankind of its responsibility for the welfare of the future generations that will inhabit this small planet. Among the resources of the planet, none are more important than the plants and animals that provide man with his food. FAO is fully conscious of its role, not only in conserving these fundamental resources, but also in trying to eliminate one of the worst aspects of "pollution" — the underemployment and poverty that still afflict a very large proportion of the world's agricultural population. As a result of the Stockholm conference FAO was given a number of important additional responsibilities as part of the international effort in the environmental field.

A major event in the international community in 1971 was the decision of the General Assembly of the United Nations to recognize the representatives of the People's Republic of China as the only legitimate representatives of China. This was followed by an invitation by the FAO Conference to China to join FAO at any time it wished. China is not only the world's most populous country; it is also still to a considerable extent an agricultural country. As Director-General of FAO, I am anxious to learn more about the agricultural development experience of China so as to put it at the disposal of our developing Member Nations.

The past year has seen a number of international developments which have not been very encouraging. The world monetary crisis had repercussions on both trade and aid. The climate for international development assistance has been less favourable than for many years. The third UNCTAD meeting again set a target of 1 percent of the gross national product for foreign aid, but although there was a further increase in such assistance in 1971, the percentage of GNP that it represents has in fact fallen from 0.95 percent in 1961 to 0.81 percent in 1971 for the 16 major donor countries. Many of these countries are looking more and more critically at their foreign assistance expenditure, especially in the light of the need for greater expenditure on economic and social programmes (including environmental measures) within their own countries.

Like the developing countries that depend on international assistance for their development needs, the international organizations have been affected by this turn of events, as well as by the inflation that is now plaguing so many of the developed countries. It is partly for this reason, but also because I believe that FAO must continually adapt itself to the changing needs of a changing world, that I have recently instituted a major review of priorities in the Organization's work programmes. I believe that we have identified a number of activities that can now be given lower priority than was necessary in the past. But in so doing we are inevitably identifying other activities that will require increased emphasis in the future. The solution of one problem always brings new problems in its wake — a good example is the economic and social problems following upon the technological revolution sparked off in some countries by the high-yielding cereal varieties, which must be resolved if the full technological potential is to be realized. The conclusion is inescapable that increased international assistance to agriculture, whether given directly to the developing countries or indirectly through international agencies, will be essential for the achievement of the targets of the Second Development Decade.

Nowhere is the careful ordering of priorities more necessary than in agricultural research. Last year I was able to announce an important step to this end, through the establishment, jointly with the World Bank and the United Nations Development Programme, of a Consultative Group on International Research. This group has begun its work of identifying major gaps in agricultural research and of encouraging and financing the research needed to fill these gaps, and this has already led to the establishment of the International Crop Research Institute for the Semi-Arid Tropics. It is therefore appropriate that one of the special chapters in this year's The state of food and agriculture *should be devoted to the acceleration of agricultural research in the developing countries. The study emphasizes the relation of research to the development process, of which it is an integral and vital component.*

Improved technology has been the major contributor to the vast increases in agricultural production that have been achieved over the years in the developed countries. It is playing a major role in the developing countries as well, and will have to do so still further if production targets are to be met in the Second Development Decade and beyond. In the transfer of modern technology to millions of small farmers, a vital part is played by all aspects of the agricultural education and training system. In 1970 FAO, in association with the International Labour Organisation and the United Nations Educational, Scientific and Cultural Organization, convened a World Conference on Agricultural Education and Training, which was the first occasion on which government representatives had come

together to discuss the basic issues involved in developing new concepts for the adaptation of agricultural education to changing economic and social conditions. It was clear that much rethinking of traditional concepts would be needed, and the second special chapter in this report therefore takes a fresh look at agricultural and rural education in the context of development.

It is particularly important to get our educational priorities correctly focused early in the Second Development Decade. It is necessary not only to look at education as one of the inputs for development, but also to consider whether present systems are really appropriate to support rapid change. The main focus in the past had been on institutional education, and more attention needs to be given to the role of the various informal and out-of-school systems that may be more effective in reaching greater numbers of people. Governments have failed to plan agricultural education systems as a whole and to relate them closely enough to trained manpower needs and employment opportunities. It is essential to pay more attention to properly conceived national programmes for out-of-school youth, who form so large a part of the rural population in many countries. The basic objective of all forms of agricultural education and training should be to help the farmer and his family to improve both their production and their living conditions, and I hope that this special chapter will prove a useful step in the necessary rethinking to this end.

All in all, then, 1971 was not a very encouraging year. It will need the best efforts of all concerned to bring about a more hopeful outlook for the agriculture of the developing countries, taking full account of such new priorities as those in research and education that are stressed here. Let us be under no illusion. As far as agriculture in the developing world is concerned, the Second Development Decade seems to have got off to a poor start. If urgent measures are not taken to redress the situation, the whole international strategy for the decade could well be in jeopardy.

A.H. BOERMA
Director-General

HIGHLIGHTS

● World production of agricultural, fishery and forestry commodities grew by about 3 percent in 1971. Agricultural production in developing countries rose by only 1 to 2 percent, well below the goal of a 4 percent annual growth rate during the current decade and contrasting sharply with the 6 percent gain in the developed countries. Output went up 9 percent in North America, 5 percent in western Europe and 3 percent in Oceania. The regional gain was only 1 percent in eastern Europe and the U.S.S.R. 1971 was a good year for Africa and the Near East (3 percent increase), but output was stagnant in Latin America and up only 1 percent in the Far East.

● Production of cereals rose 8 percent above 1970 making this commodity group the main contributor to agriculture's performance in 1971. Wheat, at some 353 million tons, was more than 6 percent above the previous record of 1968.

● Preliminary figures for 1972 indicate that production of world agriculture remained at the 1971 level with no change in the developed regions and no acceleration in the 1971 rate of increase (1 to 2 percent) in the developing countries. Good results are expected from the Near East and Latin America but in the Far East results are again disappointing.

● The value of world trade in agricultural, fishery and forestry products increased by about 5 percent in 1971. Value of exports from developing countries declined in contrast with an 11 percent rise in exports from developed countries. Unit values of exports were generally higher (by about 3 percent) but real purchasing power of exports fell due to a 6 percent rise in prices of imported manufactured goods. Products which suffered losses in export value in 1971 were mainly those of importance to developing countries.

● Food prices continued to rise in 1971. They rose more rapidly than the general price index in only about one third of the developed countries but increases in most were still considerably above those experienced during the past decade. Food prices in urban centres in developing countries tended to rise faster than the general price level and increases of 6 percent or more were recorded in about half the countries.

● Education and training for agricultural development are critically examined in Chapter 3. It is difficult to be satisfied with either the rate or type of progress. Rural education systems are failing to meet modern needs. Few countries have as yet a well-planned system of agricultural education and training and even less have any realistic manpower planning for the rural sector. Solutions, involving brave new experiments, have to be found which achieve quicker results if massive rural unrest is to be avoided. A boldness of approach to rural education is now required from both governments and international agencies.

● The need to accelerate agricultural research in the developing countries is underlined in Chapter 4. It examines new moves to coordinate international research and suggests ways of assigning priorities at both international and national levels. Research should have more practical and well-defined goals. Its organization needs a radical overhaul in many developing countries.

Chapter 1. - WORLD REVIEW

Agriculture

Although world [1] production of agricultural, fishery and forestry commodities again increased by about 3 percent in 1971, the first year of the Second United Nations Development Decade was a disappointing one for the developing countries in this sector which is so important for their overall progress. The relatively favourable trend of world production in relation to population growth was maintained only as a result of substantial increases in the developed countries. Production in the developing countries rose by only 1 to 2 percent in 1971 and according to FAO's preliminary figures for 1972 [2] the rate of increase has not improved. There is no doubt that in the next few years agricultural progress in the developing countries will have to be much more dynamic if the goals of the Second Development Decade are to be realized.

World production of crop and livestock products rose by about 3 percent in 1971 (Table 1-1). The long-term rapid increase in fishery production slowed down substantially, with a gain of about 2 percent. Forest production increased by about 1 percent.[3]

Trends in the different regions for crop and livestock production varied considerably in 1971 (Table 1-2). Preliminary data indicate that production was stagnant in Latin America, largely because of adverse weather in Argentina and Cuba. In the Far East the increase was much less than that registered in recent years under the impact of the high-yielding cereal varieties and associated improvements, and although India again had a good crop year its growth rate was lower. Production increases were more normal in Africa and the Near East. Most developed regions showed substantial gains in production in 1971 with the main exceptions of eastern Europe and the U.S.S.R.

TABLE 1-1. – INDICES OF WORLD [1] PRODUCTION OF AGRICULTURAL, FISHERY AND FOREST PRODUCTS

	1967	1968	1969	1970	1971 [2]	Change 1970 to 1971
	... *1961-65 average = 100* ...					*Percent*
TOTAL PRODUCTION . .	112	116	117	120	123	+ 3
Agriculture	112	116	117	120	124	+ 3
Fishery.	122	127	130	137	140	+ 2
Forestry	108	110	112	114	116	+ 1
POPULATION.	108	110	113	115	117	+ 2
PER CAPUT TOTAL PRODUCTION	104	105	103	104	105	+ 1
Agriculture	104	105	104	104	106	+ 1
Fishery.	113	115	116	119	119	—
Forestry	99	99	99	99	98	— 1

NOTE: For details of the methodology and coverage of these indices, see the explanatory note on page 166.
[1] Excluding China. – [2] Preliminary.

Production 1971

Latin America was the only region where total agricultural production remained at the 1970 level, the result of serious drought in Cuba and unseasonal weather in several other countries. The drop in the region's cotton, beef and sugar output reversed the trend of recent years as it was not offset by gains in production made by Brazil, Chile and the Central American countries. In the Far East, also, the rate of production growth did not keep pace with recent years. The Far East as a region netted only slight increases, but several countries had smaller harvests of cereals, pulses, jute and tobacco. Crop targets were missed in some countries because of dry weather and in others because of internal disturbances. For 1971, China reported that despite bad weather in some provinces the grain harvest rose by 2.5 percent and other agricultural production, including livestock and poultry, was also up.

Agricultural production in the Near East countries in Asia was highlighted by a record for Turkey, athough the country's tree crops suffered reverses. Lebanon's 1971 production was also good. With

[1] Excluding China.
[2] Based on data available as of 1 October 1972.

[3] Fishery and forestry production and trade are discussed separately in this chapter.

TABLE 1-2. – INDICES OF WORLD [1] AND REGIONAL FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971 [2]	Change 1970 to 1971	1967	1968	1969	1970	1971 [2]	Change 1970 to 1971
	1961-65 average = 100					Percent	1961-65 average = 100					Percent
Food production												
Western Europe	112	114	115	117	123	+ 5	108	110	109	111	115	+ 4
North America	115	115	115	113	124	+ 10	109	108	107	104	113	+ 9
Oceania	106	128	123	122	128	+ 5	99	117	110	108	111	+ 3
Other developed market economies [3]	123	124	124	124	125	+ 1	117	116	115	113	113	—
DEVELOPED MARKET ECONOMIES	114	116	116	116	124	+ 7	109	110	109	108	114	+ 6
Latin America	115	117	121	126	126	—	103	101	103	103	100	— 3
Far East [4]	106	113	117	123	124	+ 1	96	99	101	103	101	— 2
Near East [5]	114	119	121	123	126	+ 2	103	104	103	102	101	— 1
Africa [6]	108	113	115	119	123	+ 4	98	100	99	100	101	+ 1
DEVELOPING MARKET ECONOMIES	110	114	118	123	124	+ 1	99	100	101	102	101	— 1
Eastern Europe and U.S.S.R.	120	126	123	129	131	+ 1	115	119	116	121	122	+ 1
World [1]	114	118	118	121	126	+ 4	105	107	105	105	107	+ 2
Agricultural production												
Western Europe	112	114	114	117	122	+ 5	108	109	108	110	114	+ 4
North America	109	111	110	109	119	+ 9	103	104	102	100	108	+ 8
Oceania	106	124	122	120	124	+ 3	99	113	109	106	107	+ 1
Other developed market economies [3]	122	122	123	121	123	+ 1	116	115	114	111	110	—
DEVELOPED MARKET ECONOMIES	111	114	113	113	120	+ 6	106	108	106	105	111	+ 5
Latin America	113	113	118	121	122	—	101	98	100	99	97	— 3
Far East [4]	107	112	117	122	124	+ 1	97	99	101	102	101	— 1
Near East [5]	114	119	121	123	127	+ 3	103	104	104	102	102	—
Africa [6]	109	113	116	120	124	+ 3	99	100	100	100	101	+ 1
DEVELOPING MARKET ECONOMIES	109	113	118	122	123	+ 1	99	100	101	101	100	— 1
Eastern Europe and U.S.S.R.	120	125	122	129	131	+ 1	115	119	115	121	121	+ 1
World [1]	112	116	117	120	124	+ 3	104	105	104	104	106	+ 1

[1] Excluding China. – [2] Preliminary. – [3] Japan, Israel and South Africa. – [4] Excluding Japan. – [5] Excluding Israel. – [6] Excluding South Africa.

the exception of Afghanistan, Iran, Iraq and the Yemen Arab Republic, all of which had inadequate rainfall, the other countries enjoyed fair to good crops. Egypt and the Sudan exceeded their 1970 production levels for most crops. Overall, 1971 was a very satisfactory year for African agricultural production. Most African countries had fair to sizable harvests. The aggregate totals for the region indicate that there were few negative trends as increases were reported for most leading commodities, including cereals, fruit, coffee, cocoa and sugar. Production dropped slightly for a few commodities, including pulses, cotton, agaves and wool. Increased planting and better weather were two reasons for the upward trend in production.

There were substantial increases in the output of the developed countries. Western Europe, North America and Oceania all reported significant changes over their 1970 production. North America led the developed countries with a 9 percent increase and western Europe followed with about 5 percent. Oceania reversed its 1969 and 1970 trend and expanded its output by 3 percent. Japan's agriculture, however, continued its downward trend for the third year, and its production was 3 percent below 1970. An intentionally reduced output of cereals, especially rice, was mainly responsible for the continued negative trend.

The larger output of western Europe was due to policies and improved weather. The running down of wheat surpluses contributed to a more favourable market which was supported by higher EEC prices. New records were set by the region's major cereal crops; livestock production, however, tended to level out. Most crops in eastern Europe were larger, but total agricultural output for the region increased

only slightly because of a decrease in U.S.S.R. production.

In North America an easing of controls on production and policy attitudes in general, plus the farm legislation of 1970, appear to have encouraged production increases. A number of factors probably contributed to the larger crops. The farm programme of the United States allowed more freedom of choice in planting, there were higher feed prices and a tendency to overplant against a return of the 1970 corn leaf blight.

A modest 1971 recovery in Australia indicates an adjustment to the reduction of wheat areas in the recent past, and an increase of noncereal crops. In New Zealand, farm production and grazing improved in 1971, generally favoured by better weather than in the drier 1970 growing season.

Every year food and other agricultural production is affected by a plethora of recurring factors and phenomena. During 1971, droughts and excessive dry periods occurred in Afghanistan, Cuba, Haiti, Somalia and the Yemen Arab Republic. Floods, typhoons, heavy storms, volcanic eruptions and earthquakes caused damage in many countries, including Brazil, Congo, Ethiopia, Guyana, the Khmer Republic, Nepal, the Philippines and the United States.

Pests and disease exacted their usual tribute from all countries, but were responsible for particularly heavy losses in Congo and Zaire, where manioc disease struck and spread; in Ethiopia, where food crops were lost to the army worm; in Guyana, which suffered blast damage to the rice crop; in Lesotho, where there were losses in maize and sorghum to the boll worm; and in the Philippines, where the tungro virus damaged part of the rice crop.

Production of main commodities[4]

World aggregates for individual crops showed modest increases for the major food items. Cereals, with the exception of rice, made notable gains, the developed market economies providing most of the total world increase, although the developing countries generally reported larger harvests than in 1970.

World production of cereals rose 8 percent over the previous year, making this commodity group the principal contributor to agriculture's performance in 1971. Some countries reported sizable gains in total cereal production with increases in certain crops of a third or more over 1970.

World wheat output has been estimated at some 353 million tons. This is about 11 percent larger than the 1970 crop and more than 6 percent above the previous record of 1968. It exceeded the 1970 harvest in all regions (including China) except the U.S.S.R., and there the crop surpassed early forecasts. In part, this rise was a recovery from deliberate cutbacks by the large producing countries of North America in previous years, and in part the result of the use of high-yielding varieties and more inputs, and in some cases better weather.

Western European wheat production, at 56.6 million tons, was about 19 percent over 1970. France, Italy, Portugal, the United Kingdom and Yugoslavia all had record crops, with the Federal Republic of Germany and Spain reporting large increases over the previous year. In eastern Europe, Albania, Czechoslovakia, Hungary and Poland all had bumper crops. The U.S.S.R. was an important exception, with a harvest somewhat below the 1970 level.

In North America, the Canadian crop was almost 60 percent higher than in 1970, and the United States crop was a record. In South America, the large wheat-producing countries had better crops than in 1970, as did many countries in Africa and Asia. India and Turkey had record wheat harvests, escaping the very dry weather that plagued some of western Asia, reducing wheat and other crops in Afghanistan, Iran, Iraq and Pakistan. Oceania's wheat crop, down in 1970, rose by about 10 percent in 1971.

Barley followed the pattern of wheat, making a good gain in percentage terms, while maize made still greater gains. The year 1971 saw a complete reversal of the world's coarse grains situation to one of abundant supplies. World production rose by 9 percent as output in the United States and western Europe more than recovered from the previous year's setback, and other regions also showed increases.

Rice was the one cereal crop that lagged in 1971, at less than 1 percent below the 1970 world level, mainly reflecting a cutback of 14 percent in Japan (which has allowed some reduction in the country's surplus stocks), of 5 percent in Pakistan, and the lack of outstanding growth in the other principal producing countries. Many did report small increases, however.

The world output of pulses dropped a little from 1970, many producers reporting approximately the same harvest. Root crops followed a comparable pattern.

The 1971 world output of centrifugal raw sugar was slightly lower than in 1970. Although some large producers reported increases, three out of the four largest producers reported sizable decreases. Cuba, which had a record crop in 1970, suffered an almost 30 percent drop in its cane sugar output in 1971, and India's cane crop dropped almost 12

[4] For a more detailed account of the commodity situation, see *FAO commodity review and outlook 1971-1972.*

percent. Likewise, sugar from the U.S.S.R.'s beet crop was down about 12 percent.

The world fruit harvest showed both gains and losses compared with 1970. Output of citrus fruits rose somewhat and that of noncitrus fruits (principally apples) dropped. Weather was the variable factor responsible for most of the fluctuations, although for some regions new plantings and new irrigation projects effected some change.

The 1971 edible oilseed harvest did not reach the level of early predictions, but showed more than a 3 percent rise over 1970. Despite record crops by two large producers, the United States and Brazil, world soybean production was lower than expected. The supply of soybeans has not kept pace with demand. There was a low carryover of stocks from 1970 and strong demand, but the larger output of oilseeds in 1971 caused a downward trend in prices of most fats and oils during the second half of the year. Indications suggest that there is a trend toward an increased use of animal fat and fish oil. Fish oil production rose more than 10 percent in 1971, with regional shifts, but there was small overall change in tallow and greases.

There was a 2 percent decrease from 1970 in the production of sunflowerseed, but the output of copra and palm oil increased. Philippine copra output rose by more than 300 000 tons and world palm oil made substantial gains. Palm oil is being used increasingly as both edible and industrial oil.

World groundnut production reached record levels, with large increases over 1970 by Nigeria and Senegal. However, in Brazil and India production was slightly lower.

In 1971 coffee responded to more favourable weather in almost all the producing countries. World production is reported at about 81 million (60-kilogramme) bags, about 4.9 million tons. This is almost 19 million bags more than in 1970. The season was troubled with fewer of the frosts and unseasonal rains that had allowed fungus and other diseases to get a foothold. Coffee leaf rust disease is still a serious problem in Brazil and there is fear of its spreading. However, in Kenya losses from coffee berry disease have been checked in recent years.

World cocoa bean production at 1.54 million tons in 1971 was up almost 3 percent. Of the five largest producers, Brazil, Cameroon, Ghana, Ivory Coast and Nigeria, only Nigeria's production dropped some 19 percent from 1970. The larger crop has lowered prices and consumption is picking up. The frequent and severe fluctuations of supplies and prices have caused considerable concern among growers.

World tea production rose by 2 percent, with only minor increases and decreases for the major producers. The troubled conditions in Bangladesh reduced production there and prevented the harvest from reaching world markets on schedule. For a time this cutback in supply caused higher prices and prevented an early accumulation of surplus tea.

World tobacco production of 4.7 million tons in 1971 appears to have reached a constant level, this being almost the same figure reported for 1970. Of the five largest producers, Brazil, India and the U.S.S.R. had increased harvests, China's levelled off, and North America's dropped by over 10 percent.

World meat production in 1971 is estimated at just over 101 million tons and demand is exceeding output. The 1971 rise in total production was more than 3 percent, but increases of specific kinds of meat for some individual countries were much higher. Spain increased its output of beef by about 5 percent and France by over 4 percent. As a region, North America, with nearly a 4 percent increase in total meat production, led the world. Latin America was the only region to have a decrease in 1971, principally due to Argentina's almost 31 percent drop in beef and veal production which resulted from the drastic reductions in cattle numbers in 1969 and 1970.

World pigmeat production was up in 1971 and several countries in eastern and western Europe reported large gains. Hungary increased production by some 14 percent, the U.S.S.R. by about 16 percent and France by 11 percent. There were also moderate advances in mutton production, and poultry meat showed modest gains in most countries.

Milk and egg production remained relatively stable as no dramatic changes in output were reported. The U.S.S.R., the world's largest milk producer, pushed production only slightly above the 1970 level, and the United States output, down since 1969, increased by about only 1 percent. Eggs did better than milk, as world output rose more than 5 percent.

In recent years world production of natural fibres — wool, cotton, hemp, jute, kenaf, sisal and others — has levelled off. In 1971 only cotton was reported to have increased over the 1970 season. The long-term downward trend in wool prices has caused sheep growers in some of the larger wool-producing countries, such as Australia, to shift from sheep to beef cattle.

Of the vegetable fibres, cotton has been in greatest demand and world production in 1971 responded with a record harvest of 11.9 million tons, exceeding expectations in several countries, particularly India, Pakistan, Turkey and the U.S.S.R. China, the largest producer in the Far East, appears to have stabilized its production in recent years. This 1971 increase is attributed to expanded area and higher average yields, although some large producers had

lower yields. Since world production is slightly less than consumption estimated for 1971/72, cotton stocks will probably be reduced to new low levels.

With the exception of jute in India, hard fibre production was lower in most producing countries in 1971. The war in Bangladesh, one of the main producers, interrupted jute marketing for some time and prices soared. The domestic situation there could also change the future supply picture if food shortages require that rice be planted on much of the jute land.

Continuing a trend of several years, the production of agaves, sisal in particular, was lower in 1971. Tanzania, the world's largest producer of sisal fibre, has reduced cultivation in recent years because of the depressed market, dry weather and competition from synthetic substitutes. However, the present short supply of this fibre, which is extensively used for bale and binder twine, is making its production a viable business again.

TABLE 1-3. – ANNUAL CHANGES IN WORLD[1] AND REGIONAL AGRICULTURAL PRODUCTION

	1961-63 to 1969-71 (annual average)	1968 to 1969	1969 to 1970	1970 to 1971	1971 to 1972 [2]
	Percent				
Western Europe	+ 2.3	0	+ 2	+ 5	0 to —1
North America	+ 1.6	— 1	— 1	+ 9	0 to —1
Oceania	+ 2.8	— 2	— 1	+ 3	+1 to +2
DEVELOPED MARKET ECONOMIES [3]	+ 2.1	0	0	+ 6	0 to —1
Latin America	+ 2.7	+ 4	+ 3	0	+2 to +3
Far East [4]	+ 2.6	+ 4	+ 4	+ 1	0 to —1
Near East [5]	+ 3.1	+ 2	+ 1	+ 3	+6 to +7
Africa [6]	+ 2.7	+ 3	+ 3	+ 3	0 to +1
DEVELOPING MARKET ECONOMIES	+ 2.7	+ 4	+ 3	+ 1	+1 to +2
Eastern Europe and the U.S.S.R.	+ 3.5	— 2	+ 6	+ 1	0 to —1
World [1]	+ 2.6	+ 1	+ 3	+ 3	[7] 0 to +1

[1] Excluding China. – [2] Preliminary. – [3] Including Japan, Israel and South Africa. – [4] Excluding Japan. – [5] Excluding Israel. – [6] Excluding South Africa. – [7] Changes in food production between 1971 and 1972 are likely to be similar.

Production 1972

This review of agricultural production in 1972 is based on very provisional data, especially those relating to developing countries. Information for China and other Asian centrally planned countries is lacking. Nevertheless the figures for 1972, based to a varying degree on estimates and partial information, do give a rough indication of the direction and magnitude of change in output. Past FAO experience suggests that changes in world and regional output for the latest year (Table 1-3) are likely to move upward when final revisions are made.

First indications for 1972 suggest that world output (excluding China) remained unchanged compared with the 3 percent gain for 1971. The factors mainly responsible for this situation are no acceleration in the annual rate of increase (1 to 2 percent) for the developing regions and less or unchanged production in all the developed regions except Oceania. The most significant factor is, of course, the slow rate for the developing world at less than half the target rate set for the United Nations Second Development Decade. Tentative estimates for the developing regions do suggest better results for Latin America (up 2 to 3 percent from stagnation in 1971) and particularly for the Near East (up 6 to 7 percent). The densely populated Far East fared badly, however, with production down about 1 percent. Next year's harvests in this region will to a large extent determine whether another food crisis is to be avoided as the pressure of population growth continues. The production figures for Africa, probably the most tentative of all, indicate no increase, but later estimates are likely to be more favourable. The stable level of output in North America and western Europe can be regarded in a different light. These regions enjoyed excellent harvests in 1972 at or only slightly below the 1971 record levels. The combined production of eastern Europe and the U.S.S.R. is estimated to have declined, mainly because of the poor cereal harvests for the U.S.S.R.

Cereals dominated the agricultural situation in 1972. The world situation changed markedly following the record wheat and coarse grain crops of 1971 in both exporting and importing countries. Prospects of a smaller world output of wheat in 1972 and a substantially increased volume of trade are mainly due to events in the U.S.S.R., where wheat production suffered a severe setback as a result of winter kill and drought during the growing period. The crop has been estimated at about 80 million tons, 20 percent below the average of the previous two years. The U.S.S.R.'s massive purchases of wheat in the world market, which began in July and were estimated at the end of September at about 18 million tons, are partly for other countries with which it has supply commitments, and imports for domestic consumption are provisionally calculated at 14 to 15 million tons. This amount would far exceed the largest imports ever made by the U.S.S.R., which were about 9 million tons in 1963 and 8 million in 1965.

Aggregate import requirements for the rest of the world appear unchanged from 1971. Production in eastern Europe is likely to be lower than last year's record, but import requirements may not differ greatly. In western Europe production is expected to be lower than the previous year, and import requirements are likely to increase. Among the developing countries, imports will probably be slightly greater in Latin America, reflecting the adverse effects of weather on production in certain countries, notably Brazil, but in the Near East imports are likely to fall considerably as a result of larger production, mostly in Iran, but also in Iraq, Israel and the Syrian Arab Republic. In Africa also, import requirements may be lower following the very good crops in north Africa. In the Far East, Bangladesh is expected to continue to need substantial imports. In India, on the other hand, with the achievement of self-sufficiency in foodgrains in 1971/72 and the establishment of a buffer stock amounting to 9.5 million tons on 1 July 1972 (7 million tons of wheat and 2.5 million tons of rice) no commercial cereal imports are foreseen at present. However, the autumn harvests of coarse grains and rice suffered from drought, and foodgrain production in 1972 is expected to fall considerably below last year's total in spite of an increase in wheat. To meet domestic requirements the Government is currently releasing stocks and a massive emergency production programme has been launched to secure an increase of 15.8 million tons of foodgrains, of which 8.8 million tons would be wheat. Harvests from the winter crops will particularly affect general prospects.

On the basis of estimates of production and stocks, world wheat supplies for export during the 1972 season seem sufficient to meet import requirements. Production in the United States is expected to be somewhat less than the previous year, but with larger opening stocks supplies are about the same. In the European Economic Community another record crop is anticipated, while in Canada production should be about the same as last year. Acreage planted to wheat has increased in Argentina, where production could be as much as 20 percent greater than last year if conditions remain favourable. Indications are that world trade in wheat will reach record levels, which means that stocks in the main exporting countries will fall substantially and thus that the world wheat situation in 1973/74 will be determined to an unusual extent by the size of the 1973 harvests. On present indications, much larger areas are likely to be planted to wheat in both the United States and Canada, and it is expected that sufficient supplies will be forthcoming to meet demand also in 1973/74 unless extremely unfavourable conditions in important growing areas are repeated on the unusual scale witnessed in 1972.

At the opening of the 1972 season coarse grain stocks in the main exporting countries were almost 20 million tons more than in the previous year, in spite of larger domestic use and record exports. However, 1972 output is expected to fall considerably below the exceptionally high 1971 figure because of unfavourable weather in certain regions and, more important, a cutback in the United States where a more than 10 percent decline (about 20 million tons) is due entirely to reduced acreage. In Canada, barley area was reduced by 10 percent and coarse grain production is expected to fall by the same amount, but in the European Economic Community (EEC) the harvest is likely to exceed the 1971 record. The U.S.S.R. is expected to increase output during the 1972 season as a result of larger areas sown to spring barley and maize following the losses in wheat production, but in eastern Europe the crops appear to be affected by unfavourable weather. A slight decrease in production is expected in the developing countries. In Latin America the reduction may be as much as 15 percent, reflecting in particular a drop in maize and sorghum output in Argentina after the large crops of the previous year. In Africa, a substantial reduction is expected in the important Moroccan barley crop, while in the Far East production of coarse grains was lower in India. In the Near East, on the other hand, production is expected to be higher as a result of better crops in Iraq and the Syrian Arab Republic due to more favourable weather.

Import demand is likely to expand further during the season, also as a result of livestock development programmes. In western Europe, which accounts for more than half of world imports of coarse grains, the use of grains for feed continues to increase, but more local wheat may be fed since some of the region's 1972 wheat crop is of relatively low quality. In Japan, the largest single importing country, feedstuff requirements are likely to increase further, and with the decline foreseen in domestic barley production and in the use of rice for feed, its imports are expected to rise considerably. The U.S.S.R., the world's second largest producer, became a net importer last season when production fell by 6 percent, and this year its net import requirements have expanded again with the increased emphasis being given to livestock production. The decline in coarse grain crops in eastern Europe suggests that imports will grow considerably in these countries also, if livestock production targets are to be attained. Consequently, lower production and higher demand will result in expanded world trade and a reduction in stocks from the particularly high levels existing at the opening of the season.

In the livestock sector, preliminary estimates for 1972 show no increases in total meat production in

North America and western Europe but higher output in the other regions, and a rise in cattle numbers in nearly all major producing countries. Generally good pasture conditions in the spring and summer are likely to improve final estimates. However, the 1972 world meat situation has included an acute shortage of beef in western Europe, especially in the EEC. Strong demand in these and other markets has pushed up prices while beef production continues to fall short of demand. As early as June 1972, the EEC, the United Kingdom and the United States all suspended import tariffs, duties and restrictions for varying periods in an effort to curb and stabilize beef prices.

REGIONS

Western Europe

After the bumper harvests last year agricultural production in western Europe in 1972 is expected to decline only slightly if at all. Cereals output at 146 million tons is only 2 million tons below the record of 1971 although the quality of the crop in certain countries may be less good. In the EEC production is reported to be a record 80.8 million tons. Wheat production in the region is likely to be above the average of recent years although about 4 percent below 1971. In France the crop increased by 5 to 6 percent, mainly the result of higher yields and good weather at harvest time. In contrast reductions due to unfavourable weather, especially in the spring, are expected in the Federal Republic of Germany, Portugal, Spain and Yugoslavia, although in Spain the area sown to wheat was also slightly reduced in line with government policy. In the United Kingdom the crop was extensively affected by yellow rust, and production is currently expected to fall by some 3 percent. The region's barley crop at an estimated 42.8 million tons is a record. Production in both France and the Federal Republic of Germany was above the high levels of the previous year. In the United Kingdom, although the harvest was good, it was lower than in 1971, while in Spain increased plantings did not offset greatly reduced yields and production fell by about 14 percent. Area under maize was up in most countries, particularly in the EEC, and a small increase in production is expected.

There was a reduction in the region's beef production. Output declined in Denmark, the Federal Republic of Germany, the Netherlands, Sweden and Switzerland. In Portugal and Spain beef farmers are still suffering from the low rainfall of 1971. Production is likely to be up in Austria, Norway, the United Kingdom and Yugoslavia but unchanged in France. As a result of stagnating production and increased demand, import requirements of EEC countries have grown and beef prices have increased. Production of pigmeat will probably increase about 3 to 4 percent in 1972 after the substantial growth of 1971. The production cycle has reached its low phase in the EEC and only a slight increase is expected in the other countries. Prices are higher as housewives chose to buy more pork as a substitute for beef, in short supply.

It is anticipated that mutton and lamb production will have declined slightly, with the reduction being more pronounced in southern Europe. Poultry meat output has increased 4 to 5 percent in the EEC; measures taken to limit expansion have been only partially successful in the Federal Republic of Germany and the Netherlands, while production has continued to grow in France (5 percent) and Italy (2 percent). Output changed little in the United Kingdom.

Regional milk production is expected to increase 4 to 5 percent reflecting improved yields and higher prices to producers with most expansion occurring in France, Ireland and the United Kingdom. Butter production is likely to increase by more than 10 percent, with particularly strong growth in Belgium, France, the Netherlands and the United Kingdom. Stocks of butter held by EEC countries have expanded, and reached 350 000 tons in September 1972. Cheese production is also expected to grow by 10 percent, with the largest increases in Ireland, the United Kingdom and the EEC.

Early forecasts of sugar production indicate a reduction of more than 10 percent for the region from 1971, when weather was particularly favourable. In northern Europe beet yields and sugar content are both likely to be down. A marked reduction is expected in France, the Federal Republic of Germany and the United Kingdom.

Eastern Europe and the U.S.S.R.

In most countries in this region output in 1972 is likely to fall short of expectations. In at least two, the U.S.S.R. and the German Democratic Republic, poor crops, particularly grain crops, are responsible for this situation. The disappointing grain harvests in the U.S.S.R. led to action at a high political level, and the early government initiative to secure supplies from abroad had to be intensified. Total U.S.S.R. imports of cereals in 1972/73 are likely to amount to 15 million tons or more.

Output of cereals in the U.S.S.R. may fall some 14 million tons below the 1971 figure. This drop is attributed almost entirely to near failure (due to unfavourable weather) of the wheat crop, which at some 80 million tons is 20 percent below the 1971 level. So small a crop was last harvested in 1969

although on an area (66 million hectares) considerably larger than that expected to be harvested in 1972. Yields of other cereals were also harmed by the weather but losses are expected to be partly made up by increases in the area planted; the area under barley and rye increased by about 15 percent and maize by one third. The good maize harvest is the one bright feature of the current cereal situation in the U.S.S.R. The potato crop suffered from heat and drought and output is certain to be below the previous levels, but cotton production is expected to be unchanged or slightly up from last year's record level.

In most other countries in the region weather conditions were also not always favourable. They were particularly bad in the German Democratic Republic where storms and heavy rains destroyed or flattened crops over large areas and the wheat and barley crops are expected to be some 15 percent lower. This country is normally the largest importer of wheat from the U.S.S.R.

It appears that planned increases in crop production in Bulgaria, Czechoslovakia and Poland, ranging from 6 to 9 percent, will not be achieved, although recent estimates of the situation are more optimistic. While not reaching the 1971 record level, output of cereals in Poland is virtually certain to be above the 1966-70 average and prospects for other crops are reasonably good. Czechoslovakia is likely to have a small drop in crop output and Bulgaria expects only average results. In Hungary the wheat crop is likely to be down about 20 percent because of low rainfall. Weather conditions in Romania were generally better than in neighbouring countries, especially at spring sowing when area sown increased to 6 million hectares (of which one third under maize) and improved strains of seeds were used over large areas. The wheat harvest is a good one, estimated at 5.2 million tons, and maize is expected to be at last year's high level, about 7.6 million tons.

Livestock production is likely to increase from 2 to 4 percent in almost all countries in the region, particularly pigmeat, poultry meat and eggs. Beef and veal increased only marginally, with the possible exception of Bulgaria, and no significant changes are reported in cattle numbers. In the U.S.S.R. in the first half of 1972 output of pork rose by 11 percent and poultry meat by 15 percent in state and collective farms. Milk production changed little in the region.

North America

Preliminary estimates indicate that 1972 agricultural production in North America is only 1 percent below the record level of 1971, and 2 percent above the 1968-70 average. Grain harvests were smaller and oilseed harvests larger, and output of livestock products is expected to stay unchanged. These adjustments correspond generally to production goals in commodity programmes in effect in both Canada and the United States.

The region's wheat harvest approximated 57 million tons, 4 percent less than in 1971. An increase of 10 percent in the Canadian wheat area was offset by lower average yields and the 1972 crop is about the same as in 1971. In the United States the area was slightly smaller, and with lower average yields the crop is 6 percent smaller than in 1971. The region's feedgrain harvest is estimated at 185 million tons, 11 percent below the 1971 total. The United States maize harvest was smaller by about 10 percent as a consequence of a similar reduction in area. Although the Canadian maize area was again larger, yields averaged lower as the result of unfavourable growing conditions. Barley harvests were smaller in both countries because of reduced area and lower yields.

Total output of livestock products in North America is estimated to be unchanged. In both countries small increases in beef and veal production were more than offset by decreases in pigmeat production. Poultry meat output continued to expand in the United States but showed no change in Canada. Milk production is likely to have risen by perhaps 3 percent in both countries.

The region's production of oilseeds is expected to be larger than in 1971. From increased area and a higher average yield, the United States soybean crop is estimated at a record 35 million tons. Harvests are also larger in the United States for cottonseed, groundnuts and sunflowerseed, and in Canada for soybeans and sunflowerseed. Canadian production of rapeseed is notably smaller as the result of a reduction in area. Linseed production was less in both countries, also because of reductions in area.

In the United States, sugarcane production is about 16 percent above 1971 as a result of increased areas in Florida and Louisiana, although the sugarbeet harvest is slightly down. The cotton crop is estimated at 2.9 million tons (lint), 27 percent above 1971 and the largest since 1965; the harvested area was expanded by 15 percent and yields averaged 13 percent higher than in 1971.

Oceania

Provisional data indicate a further expansion of total agricultural production in Oceania during 1972 by about 2 percent. Australia's wheat harvest is expected to fall short of the 1971 level, as drought reduced both area and yield, but the feedgrain harvests, particularly of oats and sorghum, are expected to be significantly larger. In New Zealand, grain

production is much higher than in 1971, with wheat and barley crops larger by a third and maize more than double. Sugarcane production in Australia is likely to equal the 1971 level, while a record cotton harvest, double that of 1971, is expected. Oilseed production in Australia has continued to expand with relatively large increases in the harvests of sunflowerseed, rapeseed, groundnuts and soybeans.

Livestock production continued to grow during 1972 in the region. Production of all the major categories of meats was again higher as the longer term trends continued. Milk production showed little change, and the 1972 wool clip is estimated to be at the 1971 level.

Latin America

Preliminary 1972 estimates for Latin America suggest some improvement over last year's poor results. Regional output of most crops and livestock products is likely to be up (with a few exceptions, including maize and sugar).

Wheat output is expected to exceed last year's figure. Prospects in Argentina, the largest producer, are good mainly because of favourable weather in the major growing areas, and at about 6.4 million tons production may be as much as 20 percent above the previous season. Wheat production in Mexico is recovering from last year's drop. A reduction in Argentina's maize production is unlikely to be offset by good harvests in Brazil and Mexico where yields in principal producing areas promise to be high, and the regional maize output is forecast at some 5 percent below last year's record 39 million tons. Argentina's 1972 sorghum production of 2.4 million tons is half the 1971 figure, but favourable weather has resulted in a very good late harvest and final results may be better. In Mexico, the second sorghum producer in the region, output is likely to remain unchanged at about 2.7 million tons. Rice output is expected to increase because production in Brazil should recover from the poor harvest of 1971 and approach the 1970 level of 7.5 million tons. The outlook is also favourable in Colombia and Peru.

Beef and veal production should recover from last year's fall of 7 percent mainly because of an improved situation in Argentina. The favourable trend in regional milk production continued in 1972 as a number of countries made special efforts to meet increasing domestic demand.

Regional sugar production will probably continue downward because of another fall in Cuba's output. Banana production is expected to increase again because of favourable prospects in the major producing countries, Brazil, Costa Rica and Ecuador. The 1972 coffee crop is currently estimated to be unchanged although frosts in the major producing areas may have some effect on the Brazilian crop and in Colombia coffee farmers have reported excessive rains which seriously affected the first crop harvested early this year. On the other hand, favourable weather may lift coffee production in Mexico to more than 2 million tons, the biggest crop ever harvested in that country. Cocoa output will probably be higher as increased production in Brazil may more than offset decreases in Ecuador and the Dominican Republic. The 1972 cotton harvest promises to be a record because Brazil's crop will be one of the largest this country has had as conditions were excellent during most of the growing season.

Wool output for 1972 is expected to remain slightly below last year's depressed level of 327 000 tons, although indications point to a halt in the downward trend in sheep numbers and wool production.

Far East

Early estimates for the developing countries of the Far East do not indicate any acceleration in the rate of growth of agricultural production, but the reverse. Drought and floods in many countries, notably India and the Philippines, have adversely affected prospects for cereals and other crops. In Malaysia, output is likely to continue its general expansion. Production in Bangladesh is expected to recover because of larger areas sown and greater use of high-yielding varieties, fertilizers and pesticides. Output of most crops in this country, except sugarcane, is expected to be higher than last year when war and its aftermath led to serious reductions. Indonesia is expected to continue the rate of increase of the past few years and in Pakistan there is likely to be a partial recovery from the reduced output of 1971.

The food situation in the developing countries in the region is not promising. Cereal production is expected to increase only marginally because of weather damage to the standing crops and the reduced area sown in the major producing countries. Output of rice in several countries such as India, the Khmer Republic, the Republic of Korea, the Philippines and Thailand is expected to be less owing to the effects of bad weather and, in some countries, war. Coarse grains production is also estimated to be smaller. However, wheat production is expected to continue to increase rapidly in the region (9 percent over 1971) due to higher output in Bangladesh and India. In Pakistan wheat output is lower owing to a decline in area.

Production of oil crops is expected to show a significant increase because of larger output of palm oil and copra in most countries. A substantial increase is also anticipated in jute and kenaf, mainly

reflecting recovery in output in Bangladesh. Production of cotton and tobacco is also expected to be better than in 1971. Coffee, however, is likely to be markedly below last year's record output because of smaller crops in India and Indonesia, while a substantial drop in sugar production is probable owing to smaller cane harvests in the major producing countries of the region.

Japan. The rice harvest in Japan, at some 15 million tons, is 6 percent above 1971. There was no change in the area planted and the increase was entirely the result of higher average yields, which were abnormally low in 1971. Production of wheat and barley is lower by about a third. Total production of livestock products continued to expand in 1972. The output of poultry meat has increased by about 10 percent, eggs by 6 percent, pigmeat by 6 percent, and further small increases in beef and veal and milk production are likely.

Near East

In the Near East region, 1972 was another good year for agriculture with production some 7 percent above last year. There were better harvests for several countries that suffered drought in 1971 and a second year of good crops for most other countries. Favourable autumn and winter weather in late 1971 and early 1972 was followed by generally satisfactory conditions. Cereal crops did well. Wheat appears to have been especially good in Iran, Iraq and the Syrian Arab Republic with early harvest estimates of 4.1, 3 and 1.9 million tons respectively. These countries also had outstanding crops of barley and maize. Iraq is likely to have had record or near-record harvests for all cereals, with barley at twice the level of the 1971 crop and maize about 20 percent up. In the Syrian Arab Republic harvests have also been reported as excellent. Arrangements have already been made for exporting 150 000 tons of wheat — the first time in several years that the Syrian Arab Republic has had a surplus to export. Egypt, the Libyan Arab Republic and the Sudan all appear to have equalled or exceeded their bumper 1971 cereal harvests. The 1972 crops are estimated at 1.8 million, 143 000 and 80 000 tons respectively, all record levels. In Afghanistan, Jordan, Lebanon and Saudi Arabia cereals are estimated to be above 1971 levels. Early figures for Turkey's cereal crop put it below the 1971 record, but above harvests of recent years. Wheat and barley may be as much as 10 percent lower.

Livestock production in all countries of the region increased with better pastures and more feedgrains. All the principal meats shared in this increase: beef and veal up about 1 to 2 percent, mutton and lamb 2 to 3 percent and poultry meat by 4 to 5 percent. Nearly all the Near East cotton-producing countries estimate better 1972 crops with the possible exception of Turkey. In Egypt and the Sudan record harvests are expected. In the Syrian Arab Republic the good cotton crop is largely attributed to better weather and an increased use of locally produced nitrate fertilizer. The crops in Iran and Iraq are excellent and estimated to be about one fifth larger than in 1971. Among other crops, in Iran apricots and dates are 10 to 15 percent up but the raisin crop is lower and pistachios have suffered some fungus damage. In Cyprus the citrus crop remains at the 1971 level.

Israel. The wheat harvest in Israel was again much higher, by 35 percent to another record level, despite an important reduction in area. Production of most other field crops is also likely to have exceeded 1971 levels. Harvests of citrus and other fruits showed little change from 1971. There was a further relatively modest increase in total livestock production.

Africa

In the developing countries of Africa the prospects for several major agricultural commodities seem favourable. Larger wheat crops in northwest Africa are expected to help these countries approach their objectives of self-sufficiency, and regional imports to meet domestic requirements are likely to be lower in 1972. In Morocco, which accounts for some 40 percent of wheat production in the developing countries of the region, the crop is expected to reach 2.55 million tons, more than 15 percent greater than in 1971, while in Tunisia production may increase by more than 30 percent to 800 000 tons. Larger wheat crops are expected also in Algeria and Ethiopia. Regional barley production may decline as lower output in Morocco may not be offset by increases in Algeria and Ethiopia. Maize production is likely to be greater as a result of expanded output in Kenya, the region's largest producer, as well as good crops in other major producing countries such as Ethiopia, Malawi, Nigeria and Rhodesia. Little change is foreseen in millet and sorghum output but, as with most smallholding crops, production data are difficult to obtain.

Indications are that the rice crop in Madagascar, by far the largest producer of the region, will be only slightly greater than in 1971. Further assistance has been extended by the EEC, through the the Fonds européens de développement (FED), to increase rice production in order to restore the country to its position of net exporter. Among the other important producing countries, output is expected to expand slightly in Nigeria, but in Sierra Leone unseasonal heavy rains may have damaged the crop. Ivory Coast, which is one of the largest

rice importing countries of the region, has also received assistance from FED for a rice development scheme for 1972-76, and Liberia, which imports about 50 000 tons a year, plans to become self-sufficient by reclaiming swamp areas.

Regional beef and veal production will expand slightly, reflecting growth in a number of countries including Ethiopia, Kenya, Nigeria and Tanzania. Efforts are being made in many countries to expand meat production for the domestic market. Of particular importance in this respect is the 4 percent increase in output of poultry meat. Milk production may also be greater as increases are expected in many countries, including Kenya, Morocco and Tanzania.

Among the other food crops, indications are that sugar production will be higher, reflecting a substantial increase in Mauritius, the largest producer among the developing countries of the region, where output increased as a result of favourable weather and a high extraction rate. Production in Réunion is also expected to be higher than in 1971 when inadequate rainfall affected the crop. Following good 1971 groundnut crops, production in 1972 is expected to increase further, reflecting continued growth in Senegal where measures to encourage production are being implemented. In Nigeria higher producer prices for the 1972/73 season are expected to result in a larger crop following increased plantings.

Among the beverage and tobacco crops, which as a group contribute about half the agricultural export earnings of the developing countries of the region, early forecasts indicate little change in coffee production and a probable reduction in cocoa output, but the bulk of coffee and cocoa crops is harvested in the latter part of the year and final results will therefore be dependent on weather. In Ghana, the price to cocoa producers has been increased by 25 percent for the 1972/73 main crop. Regional production of tea is expected to be greater than in 1971 when drought affected output in east Africa. Tobacco production may also be up as a result of a larger crop in Rhodesia as well as in a number of smaller producing countries, particularly Malawi, where output has been expanding over the past few years.

South Africa. The maize harvest in South Africa is a record at approximately 10 million metric tons, 15 percent over 1971. Harvests of other major grains (wheat and sorghum), sugarcane and groundnuts roughly equalled 1971 output. Production of citrus and other fruits is likely to be unchanged or slightly larger than in 1971. Total livestock production is estimated to be higher during 1972, with further small increases in beef and veal, mutton and lamb, pigmeat, poultry meat, eggs and milk production. The 1972 wool clip is greater by 9 percent.

Sources of growth

There are two main sources of growth: changes in resources used and changes that affect output per unit of input. Sources of recent growth in world agriculture differ considerably in their importance between the developed and developing countries, yet the rates of growth do not differ substantially. They are slightly higher in developing countries mainly because of faster growth of demand under the impact of large population increase and high income elasticity. The most striking difference is that in the developed countries most agricultural growth, some 60 to 80 percent, comes from organization and technology or increased efficiency. Changes in resources used are still by far the major source of growth in the developing countries: increases in labour, land and traditional capital are still the main contributors.

The graphs illustrate the different patterns of resource use in the rich and poor countries, attention being focused on traditional inputs of land, labour and capital. A measurement of technology and its associated factors, such as education, research and institutional improvements, is not attempted. This short analysis underlines, as other detailed studies of growth have done, the key importance of new or nontraditional inputs in the modernization of agriculture, especially new knowledge used directly, as in new methods of cultivation, or in improved machines, seed, animals, disease control, and so on.

There is generally insufficient appreciation of what is involved in producing the historic 3 percent annual growth rate that world agriculture has achieved in the last 20 years. World output has almost doubled in this period, although this immense achievement is usually overshadowed by the close margin between growth in food supplies and population. Even, for example, one tenth of a percentage point in the long-term growth rate between 1948 and 1971 is enough to increase world grain production by some 20 million tons and world population by some 11 million. Figure 1-1 shows that world grain production almost doubled between 1948-50 and 1969-71, from 669 million to 1 238 million tons, at a growth rate of

3 percent per year. All regions shared in this growth: North America was at one extreme (2 percent), largely owing to government policy, and Oceania (3.7 percent) at the other. All regions in the developing world had relatively high rates judged by earlier figures. Where did this huge growth in grain output and other farm production come from?

Taking the first source listed, changes in resources used, additional land is still a major source of growth in developing countries although gradually becoming less so. With this decline in the relative importance of additional land, intensity of land use is rising, particularly in the more densely populated countries. The area multiple cropped in India, for example, was 49.9 million acres (20 million hectares) in 1964-65 (multiple cropping index = 115.2), rising to 61.8 million acres (25 million hectares) by 1970-71 (index = 117.7), and is projected at 103.5 million acres (42 million hectares) by 1980-81 (index = 129.7).[5] Table 1-4 shows the contribution to growth of world grain production of increases in land and in yield for the two periods 1948-71 and 1960-71. In the first and longer period, more land (with unchanged inputs) accounted for about 28 percent of the growth and higher yields for the rest. The land contribution was much greater in the developing regions, for instance 78 percent in the Near East, 50 percent in the Far East, and 48 percent in Africa. In sharp contrast, additional land area accounted for only 3 percent of the rise in output in western Europe, and in North America the decline in land area meant that yield accounted for 150 percent of the increase. For the second period (1960-71) Table 1-4 shows that additional land area is declining in significance in all regions except Oceania as a source of growth.

This simple comparison of contributions from land and yield does not, of course, imply that land itself brought about the increase attributed to it. It was presumably associated with an unchanged combination of inputs, for example, unimproved seeds, etc. Yield increases, too, are a complex of many factors which tend to vary in different regions. More recently the use of high-yielding varieties has undoubtedly been a major contribution.

Figure 1-2 shows that the economically active population in agriculture, admittedly a crude indicator, increased from 684 million in 1950 to 770 million in 1970, and is expected to amount to 801 million in 1980. It also shows that the great majority of farm people are not in the developed countries.

FIGURE 1-1. – GRAIN PRODUCTION BY REGION, 1948-50 AND 1969-71

(million metric tons)

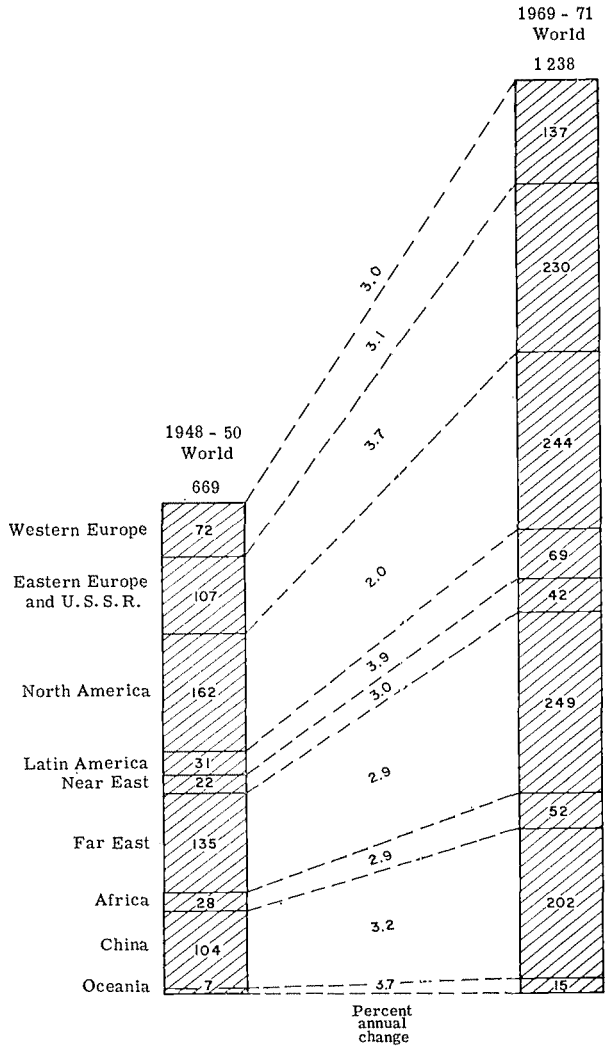
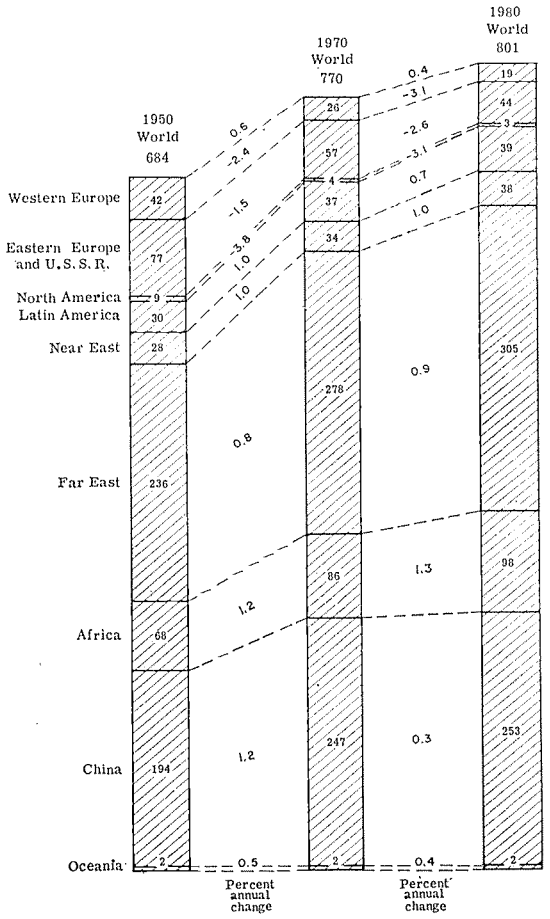


TABLE 1-4. – CONTRIBUTION OF LAND AND YIELD TO INCREASE IN WORLD GRAIN PRODUCTION, 1948-71 AND 1960-71

	1948-71		1960-71	
	Area	Yield	Area	Yield
	..... *Percent*			
Western Europe	3.0	97.0	— 2.9	102.9
North America	— 50.0	150.0	— 34.6	134.6
Oceania	73.0	27.0	118.5	— 18.5
Latin America	68.6	31.4	57.4	42.6
Far East	50.0	50.0	41.7	58.3
Near East	77.8	22.2	36.4	63.6
Africa	48.3	51.7	43.3	56.7
Eastern Europe and U.S.S.R.	10.8	89.2	3.3	96.7
China	28.1	71.9	21.2	78.8
WORLD	27.6	72.4	20.0	80.0

[5] Dana G. Dalrymple. *Survey of multiple cropping in less developed nations*. Washington, D.C., Foreign Economic Development Service, 1971. FEDR 12, p. 70.

FIGURE 1-2. – POPULATION ECONOMICALLY ACTIVE IN AGRICULTURE, BY REGION, 1950, 1970 AND PROJECTED 1980 (millions)



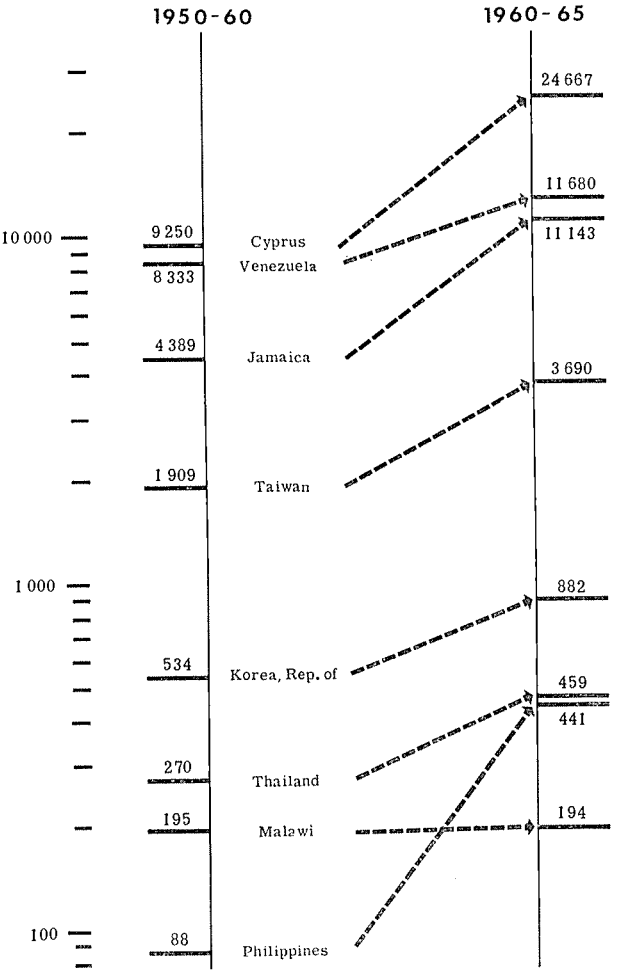
It indicates a continuing rise in the total labour force, but also illustrates changing patterns between the developed and the developing regions, with declines in the developed regions, for instance in western Europe from 42 million in 1950 to 26 million in 1970, compared with annual increases of 0.8 to 1.2 percent in the developing regions. These figures reflect a key problem of agriculture in developing countries — the low productivity per worker. Large-scale movement from rural to urban areas, which has recently enabled farm labour productivity to rise rapidly in developed countries, is not an easy solution for developing countries. Some measure of their low productivity is shown by the following: if 1 = output related to population economically active in agriculture, then North America is 28, Oceania 9, western Europe 3.4, eastern Europe and the U.S.S.R. 1.9, Latin America 1.2, Near East 0.7, Africa and the Far East 0.4.

Although it is very difficult to estimate labour's contribution to increases in agricultural output, the factor share approach derived from marginal productivity analysis is widely used in economic literature.[6] It assumes that the fraction of additional output attributable to one factor, for example labour, is the same as the fraction of total national income that is earned by the factor, or group of factors, that increase. Very roughly, if it is assumed that labour's share in national income in developing countries is from 70 to 80 percent and that the agricultural labour supply has been increasing there by 1.1 percent annually since 1950, then additional labour would account for a rise of about 0.8 to 0.9 percent annually in total production, or a share of between 25 and 35 percent of the total rise in agricultural production.

As for capital, it is difficult to measure both its quantity and its contribution to growth. Capital as

FIGURE 1-3. – INVESTMENT PER ADDITIONAL AGRICULTURAL WORKER IN SELECTED DEVELOPING COUNTRIES, 1950-60 AND 1960-65

(U.S. dollars)



SOURCE: Szczepanik, Edward F. *Agricultural capital formation in selected developing countries*, Rome, FAO, 1970, p. 37, Agricultural Planning Studies No. 11.

[6] See Edward F. Denison, *Why growth rates differ: postwar experience in nine western countries*, Washington, D.C., The Brookings Institution, 1967, p. 33-44.

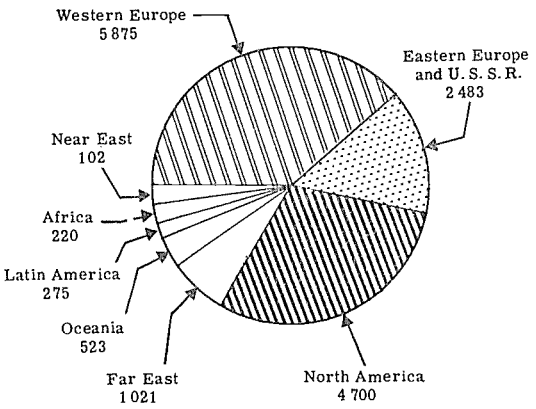
FIGURE 1-4. – FERTILIZERS AND TRACTORS IN AGRICULTURE, BY REGION, 1950 AND 1970

FERTILIZERS

(Thousand metric tons)

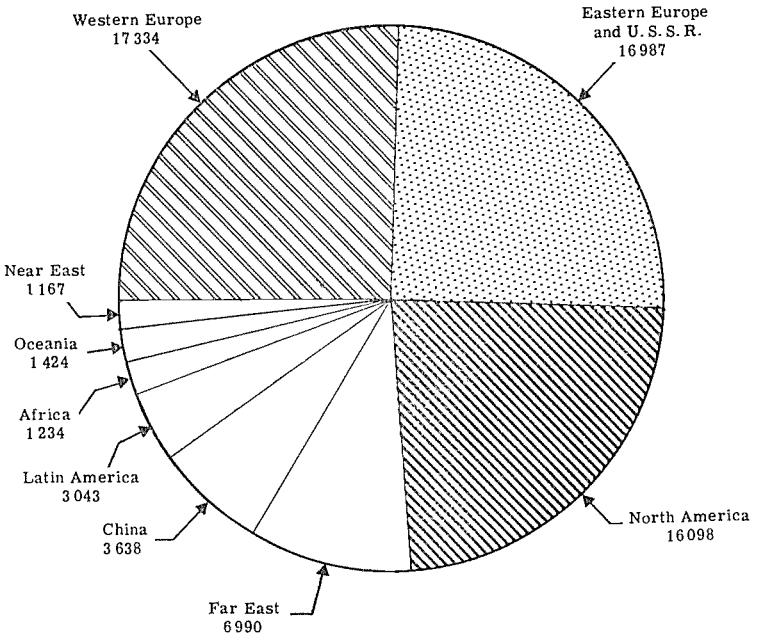
1950

World [1] 15 227



1970

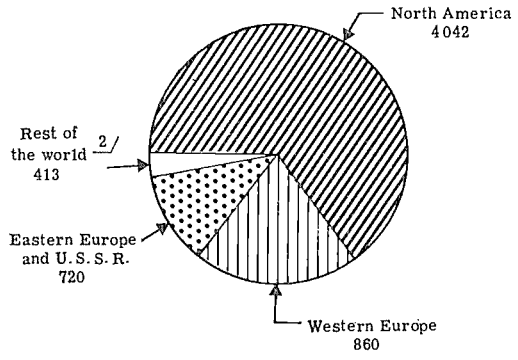
World 67 916



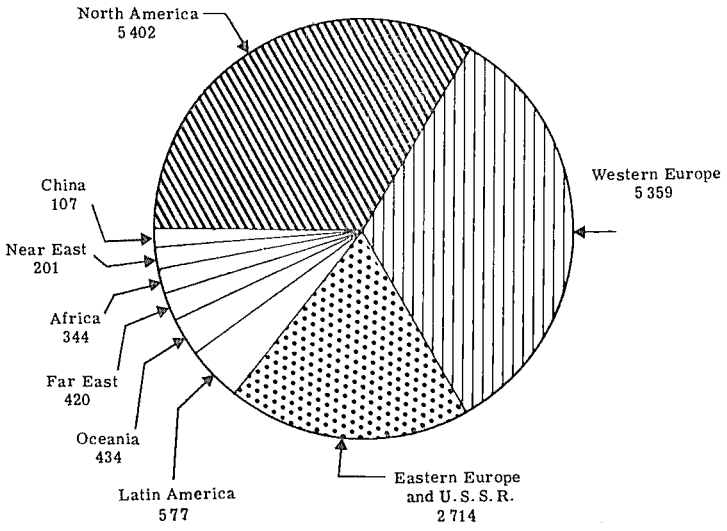
TRACTORS

(Thousands)

World 6 035



World 15 558



[1] Excluding China (estimated 28 000 metric tons). – [2] Includes: Oceania 164, Latin America 122, Africa 87, Near East 27, Far East 13.

such may also embody, and nowadays does, improvements in technology. These improvements, rather than unchanged capital, are the major contributor to growth. Statistics on capital, when they are available, are generally unsatisfactory because concepts used in economic research or in accounting are often inadequate. However, there is no doubt concerning the contrast in the quantities of capital used in developed and developing countries. Within developing countries there is a surprisingly wide range in the quantity required per additional worker (Figure 1-3). Two indicators are used in Figure 1-4 to show the wide differences between and within developed and developing regions in amounts of capital invested in agriculture between 1950 and 1970: fertilizer consumption and number of tractors. Fertilizer has been called the spearhead of agricultural development. Its use implies a radical change in farming methods and more capital investment although fertilizer, strictly speaking, is only working capital. It is being used to an increasing extent in package programmes combining improved seeds, power equipment, insecticides and other inputs associated with a more capital-intensive system. Tractors are relevant not only for their displacement of labour, but also for their provision of greatly increased power to labour. Inputs in the form of tractors and fertilizers are increasing rapidly, especially in the developing regions, but are still overwhelmingly concentrated in developed areas. Recent trends show that total annual additions of capital in agriculture in developed countries, such as the United States, are beginning to decline, although the capital per farm worker is radically increasing due to the decrease in numbers of workers.

The picture is thus one of reduction in land area and labour and a slowing down or even decrease (United States) in annual investment in the agriculture of developed countries, with the opposite occurring in developing countries.

As stated earlier, developed countries get from 60 to 80 percent of their expansion in agricultural output from the second source, technology.[7] Although comparable figures are not generally available for developing regions the proportion is very much smaller, probably below 20 percent.[8] However, technology is responsible for the most radical improvements in agriculture now under way in the developing countries. It is not easy to measure the contribution of technological factors to farm productivity, but detailed analyses confirm that it is from these largely invisible inputs (education, development and diffusion of technological knowledge, larger markets and better communications, improved private and public institutions for conservation, capital formation and investment) that the developed countries have obtained most of their growth in agricultural output for the past two decades.

A direct transfer of their experience and knowledge to developing countries has not generally proved a success. Sources of growth in developed and developing countries vary, reflecting differences in economic endowments as well as in social, historical and ecological conditions. Future patterns of growth are likely to assume closer similarity as greater investment in research and development in developing countries leads to higher rates of return on purchased inputs and as means of providing technical inputs and services to farmers improve. Nevertheless, more intensive use of land and labour is likely to be a prime source of growth in the agriculture of many developing countries for a long time to come.

[7] See, for example: Dana G. Dalrymple, *Technological change in agriculture: effects and implications for the developing nations*, Washington, D.C., Foreign Agricultural Service, 1969, 82 p.; Raymond P. Christensen, William E. Hendrix and Robert D. Stevens. *How the United States improved its agriculture*. Washington, D.C., Economic Research Service, Foreign Agricultural Economic Report No. 76, 1964, 32 p.; D.C. Myrick and Lawrence A. Witucki, *How Greece developed its agriculture*, Washington, D.C., Economic Research Service, Foreign Agricultural Economic Report No. 67, 1971, 132 p.

[8] See: S.C. Hsieh and V.W. Ruttan, Environmental, technological and institutional factors in the growth of rice production: Philippines, Thailand and Taiwan, *Food Research Institute Studies*. 7 (3): 307-341, 1967; W.E. Hendrix *et al.*, *Changes in agriculture in twenty-six developing countries, 1948 to 1963*. Washington, D.C., Economic Research Service, Foreign Agricultural Economic Report No. 27, 1965, 134 p.

International trade in agricultural products

During 1971 the value of world trade in agricultural, fishery and forestry products increased, but appears to have made less than half the gain it made during 1970.[9] Preliminary estimates indicate about a 5 percent increase in the value of exports in 1971[10] (Table 1-5). Thus, after the spurt of 1970, the expansion of agricultural trade resumed its longer term rate of growth. The value of fishery and for-

[9] It should be noted, however, that except for fishery and forest products, the FAO indices refer essentially to primary commodities and exclude trade in processed products of agricultural origin. This omission results in an underestimation of the agricultural sector's contribution to total export earnings, and is also likely to understate the growth of trade in agricultural products.

[10] The preliminary indices of international trade exclude not only the Asian centrally planned economies, but also eastern Europe and the U.S.S.R. for which data available are insufficient to enable the indices to be computed. Data for other regions are also incomplete, and the estimates presented at this time must be used cautiously as substantial revisions are often made later in the year.

TABLE 1-5. – INDICES OF THE VALUE OF EXPORTS OF AGRICULTURAL, FISHERY AND FORESTRY PRODUCTS COMBINED, BY REGION

	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	..... *1957-59 average = 100*					*Percent*
Western Europe	169	180	207	239	260	+ 8
North America	152	155	154	184	197	+ 7
Oceania	146	126	146	157	168	+ 7
Latin America	123	131	139	160	156	— 2
Far East[2]	118	124	132	143	151	+ 6
Near East[3]	125	129	137	144	162	+ 12
Africa[4]	113	123	126	140	131	— 6
WORLD[5]	141	146	156	178	187	+ 5

[1] Preliminary. – [2] Excluding Japan, and China and other Asian centrally planned countries. – [3] Excluding Israel. – [4] Excluding South Africa. – [5] Excluding eastern Europe and the U.S.S.R., China and other Asian centrally planned countries.

estry products also gained, but by less than the previous year.[11]

Although the growth rate in value of world agricultural trade slackened considerably, prices were generally higher than in 1970. However, with a rise of about 3 percent in the prices of agricultural commodities and one of 6 percent in those for manufactures, there was a fall in 1971 in the real purchasing power of agricultural exports for the world as a whole.

Unlike 1970 when the expansion of world agricultural exports was shared, although unequally, by both developed and developing countries, 1971 saw an absolute decline in exports from the latter in contrast with the 11 percent growth in the value of exports from developed countries (Table 1-6). In Africa the value of exports declined by 8 percent compared with a large increase in 1970; in Latin America a decrease of 3 percent contrasted sharply with the strong expansion in 1970 and the longer term rate of growth.

The products which suffered losses in export value in 1971 were mainly those of importance in the export trade of the developing countries, particularly coffee, cocoa, rubber, oilcakes and meal. Developing countries also lost ground in some temperate zone products such as wine, wheat, hides and skins, and wool. On the other hand, food and feed products, largely of temperate zone origin, again contrib-

[11] Value indices are based on current unit values, volume indices are based on constant base period unit values, and the unit value indices are based on current unit values weighted with base period quantities entering foreign trade. As in the past, indices of volume, unit value and value of trade in farm products were calculated separately, although with the same methodology. Therefore, they bear no direct relationship to each other.

TABLE 1-6. – INDICES OF THE VALUE OF AGRICULTURAL EXPORTS, BY REGION

	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	.... *1957-59 average = 100* ...					*Percent*
Western Europe	182	191	222	253	289	+ 14
North America	151	146	132	169	184	+ 9
Oceania	144	122	142	152	162	+ 7
ALL DEVELOPED REGIONS[2]	160	157	165	193	214	+ 11
Latin America	117	124	132	151	147	— 3
Far East[3]	103	105	107	111	116	+ 4
Near East[4]	124	129	137	144	162	+ 12
Africa[5]	108	117	117	133	123	— 8
ALL DEVELOPING REGIONS	112	117	122	135	134	— 1
ALL ABOVE REGIONS	135	136	143	163	173	+ 6
Eastern Europe and U.S.S.R.	198	189	200	184	...	...
World[6]	139	139	146	164	...	...

[1] Preliminary. – [2] Including Israel. Japan, and South Africa. – [3] Excluding Japan, and China and other Asian centrally planned countries. – [4] Excluding Israel. – [5] Excluding South Africa. – [6] Excluding China and other Asian centrally planned countries.

uted most of the expansion in agricultural export earnings.[12] As the prices of agricultural products of major export interest to the developing countries were depressed last year and those of manufactures rose considerably, it would appear that the real purchasing power of the agricultural export earnings of the developing countries fell.

Disturbances in the monetary system and financial developments and policies instituted by many countries during 1971, in particular the monetary and other measures taken by the United States in August 1971, influenced international agricultural trade in varying degrees. The actual effect of the financial crisis depended on the change in a country's own currency with respect to the currencies of its trading partners and the balance of trade between individual countries.

For the year 1971, markets were only temporarily disturbed by currency changes and the fluctuation appears to have had little more than a short-lived effect on agriculture in general. The change in exchange rates may continue to have a much more marked effect on the movement of trade for some countries. Thus, the impact on future trade flows, and especially on the new round of trade negotiations scheduled for 1973, may be considerable.

[12] For a more detailed discussion of developments in agricultural commodity markets and of international trade policies, see *FAO commodity review and outlook 1971-1972.*

Export earnings

Although data for the regions are preliminary and substantial revisions are often made later in the year, it nevertheless appears that the value of export trade of developing countries fell in absolute terms from the 1970 level (Table 1-6). The largest fall was in Africa where, at the regional level, gains in value were made only in exports of live animals, meat, and coffee. The decline in Latin America reflected significantly lower exports of wheat, raw sugar, meat and cotton, which were not offset by higher prices. Earnings from coffee declined considerably reflecting the drop in prices from the high level of 1970. In the Far East,[13] export earnings increased by 4 percent. Substantial gains were made in sugar, fruit and vegetables, tobacco, oil and oilseeds, cotton, live animals and dairy products. Smaller gains were recorded for cereals, tea, jute and kenaf. In the Near East[14] the value of exports increased 12 percent over 1970. High cotton prices made this raw material the leading export commodity, accounting for about two thirds of the region's earnings. Exports of oils and oilseeds, fish, dried fruit and tobacco rose, but tobacco increased only marginally in value because of a severe price decline. Exports of rice — mainly from Egypt — were a fifth lower than in 1970 and their value dropped by 28 percent.

TABLE 1-7. – INDICES OF THE VALUE OF WORLD[1] EXPORTS OF AGRICULTURAL PRODUCTS, BY MAIN COMMODITY GROUPS

	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	... *1957-59 average = 100* ...					*Percent*
AGRICULTURAL PRODUCTS	135	136	143	163	173	+ 6
Food and feedstuffs . .	164	163	172	202	225	+ 11
Cereals	187	174	167	193	206	+ 7
Sugar	117	120	125	161	173	+ 8
Vegetable oils and oilseeds	142	150	150	200	226	+ 13
Fruit	157	157	168	170	185	+ 9
Meat	200	210	251	288	325	+ 13
Dairy products	145	142	152	175	228	+ 31
Beverages and tobacco .	113	120	121	140	133	— 5
Coffee	107	122	117	144	130	— 10
Cocoa	115	125	141	168	140	— 17
Tea	100	94	82	91	98	+ 8
Tobacco	134	127	130	128	130	+ 1
Agricultural raw materials	92	92	99	99	95	— 4
Wool	98	90	99	90	69	— 23
Cotton	96	103	96	110	125	+ 15
Rubber (natural) . . .	72	75	101	90	76	— 16
Jute and kenaf	143	119	112	106	109	+ 3

[1] Excluding all centrally planned economies. – [2] Preliminary.

[13] Excluding Japan, and China and other Asian centrally planned countries.
[14] Excluding Israel.

The value of exports from the developed regions rose almost 11 percent. The largest increase was in western Europe (about 14 percent) reflecting higher prices of food and feedstuffs, which account for the bulk of earnings. In North America, earnings increased by about 9 percent as a result of higher prices for a number of commodities, including wheat and flour, oilseeds and vegetable oils, and cotton — which also expanded considerably in volume. The value of exports from Oceania grew by 7 percent as almost all principal commodities, with the notable exception of wool, were significantly larger in terms of both volume and value.

International prices

Unlike 1970, when large increases in the value of agricultural exports were associated more with growth in volume than with price rises, in 1971 the greater part of the expansion in export values reflected increases in the unit values of a few selected commodities, due either to continued pressure of demand or shortage of supplies (Tables 1-7 and 1-8). These included fishery products, sugar, beef and veal, mutton and lamb, canned meat, butter and milk products, wine, fats and oils, and cotton. For wheat, the unusually high level of prices in 1971, which reflected developments in the world market for maize rather than wheat, raised the value of exports, while

TABLE 1-8. – INDICES OF WORLD[1] AVERAGE EXPORT UNIT VALUES OF AGRICULTURAL PRODUCTS

	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	... *1957-59 average = 100* ...					*Percent*
AGRICULTURAL PRODUCTS	100	98	101	104	107	+ 3
Food and feedstuffs . .	109	107	110	112	122	+ 8
Cereals	113	113	112	104	108	+ 4
Sugar	93	93	106	113	124	+ 10
Vegetable oils and oilseeds	99	99	97	106	112	+ 6
Fruit	104	102	105	105	109	+ 4
Meat	129	126	134	143	159	+ 11
Dairy products	108	102	105	105	131	+ 24
Beverages and tobacco .	91	93	93	104	98	— 5
Coffee	79	84	81	104	92	— 12
Cocoa	76	85	108	109	85	— 22
Tea	85	78	73	73	76	+ 4
Tobacco	104	102	103	102	99	— 3
Agricultural raw materials	88	83	88	85	83	— 2
Wool	89	76	81	74	62	— 17
Cotton	84	89	88	91	103	+ 13
Rubber (natural) . . .	66	59	71	65	53	— 18
Jute and kenaf	117	105	117	112	125	+ 12

[1] Excluding all centrally planned countries. – [2] Preliminary.

the volume was lower. The commodities for which unit export values were higher contributed more than two thirds of the gross increase in the value of world exports.

Increased import requirements were reflected in generally buoyant world market prices for beef and veal, dairy products and wine. Demand for fats and oils continued the strong upward movement of recent years, and although the average price level was 2 percent higher than in 1970 it tended to move down during the year, particularly for coconut oil. Sugar prices rose sharply in 1971 as world supplies fell short due to the rise in consumption. Similarly, cotton prices rose substantially following lower output in the two crop years preceding 1971/72, the steadily rising utilization and the drop in carryover stocks to very low levels by the middle of 1971. Developments which culminated in the Indo-Pakistan war and their aftermath reduced the jute output and exports of Bangladesh and prices rose to high levels. Prices of sisal and henequen also rose in 1971, following reduced production due to adverse weather and the exhaustion of stocks.

For several commodities, especially coarse grains, rice, oilcakes and meal, some vegetable oils (particularly palm and coconut oil), all tropical beverages except tea, bananas, wool, rubber, and hides and skins, prices were generally lower because supplies exceeded effective import demand. Many of these commodities are of considerable importance in the export trade of the developing countries. Several of them, especially coarse grains, oilcakes and meal, coffee and cocoa, enjoyed relatively higher rates of export growth in the 1960s (in value terms) than many other commodities and in 1970 prices for some (excluding rice, cocoa, wool and rubber) were exceptionally high.

A complete reversal took place in the coarse grains market from the situation of near shortage in 1970, following the steep rise in North American production together with higher output in other major producing countries, while rice prices declined further, reflecting large export supplies in 1971 and weak import demand which resulted in intensified competition and increased resort to export aids and concessional transactions.

Among the tropical beverages, Arabica coffee prices fell sharply from the high level of 1970 due to larger export quotas for 1970/71, expectations of recovery in the 1971/72 crop, and a more competitive Brazilian export policy. However, the decline was stemmed after mid-1971 following substantial quota reductions and purchases for inventory building in the United States in anticipation of major dock strikes. Excess production of cocoa in 1970/71 and the expectations of a further surplus in 1971/72 led to large price declines. Tea quotations fell in London auctions, but increased in the major producing countries due to growing domestic consumption.

Prices of natural rubber declined further as world production again exceeded consumption in 1971, due mainly to steady expansion in the use of synthetic rubber. Depressed conditions in the textile industries in most developed countries and more severe competition from synthetic fibres resulted in reduced wool imports, and prices averaged lower than in 1970.

On the whole, increases in prices were of relatively greater benefit to developed than developing countries. While earnings from food and feed exports grew by more than 12 percent for developed countries, the increase for developing countries was 7 percent. Earnings from beverage and tobacco exports expanded by about 8 percent in developed countries but they fell by about 8 percent in developing countries. Export earnings from raw materials, of relatively less importance to developed countries (in 1971, 8 percent of the value of total agricultural exports compared with 22 percent for developing countries), fell by about 5 percent in developed countries and 4 percent in developing countries.

Agricultural imports

Figures for 1971 were not available from all regions for the calculation of a complete volume index (Table 1-9). According to the data available, im-

TABLE 1-9. – INDICES OF THE VOLUME OF AGRICULTURAL IMPORTS, BY REGION

	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	... 1957-59 average = 100 ...					*Percent*
Western Europe	126	128	134	139	141	+ 2
North America	113	124	115	119	123	+ 4
Oceania	110	113	123	128	131	+ 2
ALL DEVELOPED REGIONS[2]	129	134	138	144	146	+ 2
Latin America	144	154	156	151	153	+ 2
Far East[3]	176	173	169	181	182	+ 1
Near East[4]	175	176	166	189	216	+ 14
Africa[5]	152	148	142	163	165	+ 1
ALL DEVELOPING REGIONS	164	165	161	172	177	+ 3
ALL ABOVE REGIONS	135	139	141	148	151	+ 2
Eastern Europe and U.S.S.R.	144	147	146	177	...	...
World[6]	136	140	142	151	...	...

[1] Preliminary. – [2] Including Israel, Japan and South Africa. – [3] Excluding Japan, and China and other Asian centrally planned countries. – [4] Excluding Israel. – [5] Excluding South Africa. – [6] Excluding China and other Asian centrally planned countries.

ports for developing countries increased in volume and value by about 3 and 7 percent respectively.

In Africa, the diversion of more domestic production for home use and greater import substitution held imports to a small volume increase, but the value was up because of price rises. Cereals, vegetable oils and sugar were the main items purchased. Imports in 1971 for the Far East increased but at a lower rate than during 1970. Larger grain harvests in countries that are traditional importers reduced demand. A decrease in economic activity, political disturbances and policy measures also helped to reduce imports. Preliminary figures for the region indicate that volume was up less than 1 percent and value by about 3 percent. Sugar, cotton, and vegetable oils and oilseeds were the leading commodities imported.

In Latin America the index of agricultural imports rose almost 4 percent in value over 1970, with large increases in sugar, vegetable oils and oilseeds, and dairy products. Conversely, imports of cereals, live animals, beverages and tobacco were smaller in volume and value.

The import trade in the Near East increased as a result of poor crops in some countries, but greater population pressure and a rising level of per caput income are having longer term effects in other countries in the region. Cereals, sugar, live animals, dairy products, tea and coffee were the principal items imported and considerable intraregional agricultural trade took place. Higher prices led to generally greater increases in value than in volume. Imports in 1971 in the developing countries of the region increased over the previous year by about 14 percent in volume and 24 percent in value.

Strong demand in North America for most traditional import commodities resulted in increases despite some higher prices. The volume of imports of coffee, cocoa, sugar, bananas, tobacco, and vegetable oils and oilseeds increased, while meat and meat products lagged. For Japan this was reversed, as imports of livestock products and all red meat were larger. Sugar and wheat imports were also up but feedgrains and oilseeds were lower, and cotton and wool imports were slightly lower than in 1970. South Africa imported less in terms of both volume and value, particularly of cereals and meat. Israel imported more feedgrains, sugar, dairy products and oilseeds and vegetable oils, but wheat imports dropped by about 25 percent following increased domestic production. In western Europe agricultural imports grew at a much lower rate than during the past years. Food and feedstuffs made up almost two thirds of total imports, with cereals, vegetable oils and oilseeds and meats together accounting for over a third of this share. Raw materials as a group dropped by 6 percent.

A more detailed review of the trade of the individual regions is given in Chapter 2.

Stocks

Changes in stocks of agricultural products reflect not only developments in production and trade but also government policies affecting prices, output and utilization.[15] Little information is available regarding stocks in centrally planned and developing countries. Annual changes in food availabilities in developing countries are almost entirely dependent on crops. In poor crop years this can give rise to dramatic shortages, and to safeguard against these a number of countries are building stocks of staple foods.

Wheat stocks in the main exporting countries [16] are expected to amount to about 47 million tons by the end of the 1971/72 season compared with 48 million the previous year. Wheat production reached a record in 1971, about two thirds of the increase being in developed countries. Stocks increased most in the United States, to 23.5 million tons from 19.9 million the previous season, reflecting in part a 20 percent increase in production as a result of favourable weather and of increased acreage following a modification of domestic policies (see Chapter 2). In Canada, too, production expanded, with the restoration of a more normal area of cultivation after the end of Operation LIFT (Lower Inventories for Tomorrow) which had reduced acreage by 50 percent in 1970; stocks are nevertheless expected to decline as a result of expanded shipments. Developments in wheat production, consumption and trade, and their effects on stocks for both the United States and Canada, are shown in Table 2-24 (Chapter 2). In the EEC countries, larger production as a result of higher yields led to expanded exports and increased stocks.

Although substantially below the record 1970 figure of 64 million tons, the level of stocks at the end of the 1971/72 season is considered to contain an element of surplus. In line with the Agricultural Act of 1970, the objective of the United States wheat programme is to adjust production to prospective domestic and export requirements, and the 1972 programme aims at reducing the wheat area below the 1971 figure. In Canada, the one-year LIFT operation has been succeeded by longer term measures designed to influence wheat production so as to avoid excessive stock build-up. In Australia, on the other hand, the falling level of stocks during the 1971/72 season led to an increase in the national

[15] Statistics on stocks are given in Annex table 5.
[16] Argentina, Australia, Canada, the United States, and EEC countries.

quota to 11.1 million tons compared with 9.2 million for the 1971 crop. However, if domestic and export requirements fall below expectations, the national quota will be reduced in the following season. In EEC there was an increase of 4 percent in both the target price and the basic intervention price for soft wheat, basically for the purpose of income support.

Stock figures for India reflect the fundamental change which has taken place in its supply position. Since the introduction of high-yielding varieties in 1966/67, production of wheat has continued to increase and has reached a level where the country can now be regarded as virtually self-sufficient. With procurements of 5.1 million tons exceeding public distributions of 4.5 million tons, 1971 marked a turning point. A substantial wheat reserve has been established, and at its peak of 8.5 million tons in 1971 raised problems of storage and transport. The fourth plan target for the buffer stock of foodgrains to guard against poor harvests has been attained and concessional imports have been discontinued. In view of the further expansion of wheat production in 1971/72 another addition to stocks is likely unless the absorptive capacity of the market increases or export outlets become available. Government support payments for domestic procurement and public distribution are expected to increase considerably. In Pakistan, wheat production declined as a result of drought and imports of more than 1 million tons are envisaged to build reserve stocks to avoid future shortages.

The sharp increase expected in the level of coarse grain stocks in 1971/72 follows a near shortage in the previous season. Stocks in the main exporting countries [17] are expected to rise by almost 40 percent to about 62 million tons. Most of this increase is due to a sharp recovery in maize production in the United States, where an exceptionally large area was planted because of the serious effects of corn blight the previous year, the low level of stocks and the possible recurrence of the disease in 1971. Stocks of coarse grains in the United States are expected to reach 46 million tons, compared with 31 million at the end of 1970/71. Increases are also foreseen in Canada, where barley stocks will reach a new record and overall stocks will amount to about 8 million tons.

Although the rise in the United States carryover of coarse grains represents partly a replenishment of reserves which were below normal, an element of surplus has emerged and the United States feedgrain programme for 1972 aims at withdrawing from production about 15 million hectares, double the land actually retired in 1971. In Canada, also, there is a surplus element in barley, and some basic income support continues to be given to farmers, leaving them free to adjust production plans in accordance with market expectations. In Argentina, support prices for coarse grains were increased, reflecting the upward trend in domestic prices, while in EEC target prices for the 1972/73 season have been increased by 4 percent for barley and 5 percent for rye and maize.

Ample stocks of rice exist in certain exporting countries, although some reductions took place from the previous year following smaller crops or bigger disposals. However, with large export supplies and weak effective demand, prices fell in 1971 to the lowest level in more than a decade. In Japan, stocks were reduced substantially following larger exports and domestic consumption, but the volume held by the Government was still high at the end of the year. The land diversion programme in Japan curtailed the paddy area by 8 percent. In the United States, the 1971 acreage allotment remained at the 1970 level, but production increased slightly because of favourable weather. The 1972 allotment has been kept at the same level.

Stocks of butter and skim milk fell to relatively low levels in 1971. The world shortage of major milk product supplies became more acute during the year and availabilities for food aid were sharply reduced. EEC, the main area of surplus butter supplies in the late 1960s, virtually withdrew its export subsidies, but following a build-up of stocks in certain countries during the first part of 1972 prices began to fall and the subsidies were reintroduced. With relatively low opening stocks, most major exporters of skim milk powder were forced to reduce shipments in spite of further drawing on stocks and lower food aid donations. EEC not only withdrew all subsidies on exports during the first half of 1971, but even imposed a levy in the autumn. Purchases by the main developing commercial importers (Chile, Cuba, Malaysia, Mexico, Peru and the Philippines) increased by about 20 percent, due to an expansion of nutrition programmes and the requirements of milk recombining industries set up in years of low import prices. By the end of 1971 prices of skim milk powder were nearly twice the level of a year earlier, but there was some decline at the beginning of 1972.

The recovery of Brazilian coffee production from the frosts and drought which severely reduced the 1970/71 crop raised world production in 1971/72 to the highest level since 1965/66, bringing it close to the current level of world consumption after five years of deficit. Stocks in producing countries at the opening of the season were considerably lower than the previous year as a result of further drawings on Brazilian stocks, which in 1971 accounted for about one half the world carryover in producing countries as compared with more than 80 percent

[17] Argentina, Australia, Canada, the United States, and EEC countries.

in 1966. In other producing countries total carryover rose considerably. Much of the increase was in Africa (where the carryover rose by more than 700 000 tons, equivalent to a large proportion of the region's annual output), in Central America, and also in India and Indonesia. Developed importing countries, notably the United States, had relatively large stocks, thus making the demand for imports over the short term relatively more sensitive to price movements.

A significant reduction took place in the world carryover of sugar in 1971 for the first time since the emergence of surpluses in 1965, as a result of the continued expansion in 1970/71 of world consumption of centrifugal sugar and the slight decrease in total output compared with the previous season. Carryover at the end of the 1970/71 season is estimated provisionally at 18.5 million tons, about 13 weeks' (world) supply, compared with 21.1 million tons or 15 weeks' supply at the end of the previous season. About one quarter of the reduction resulted from heavy drawing from the previously large stock in India. By the end of the 1971/72 season a further decrease in carryover stocks is foreseen, as production is again expected to fall short of consumption.

Food prices

Food prices[18] continued to increase in 1971. Inflation was a source of major concern in developed countries, and measures were taken in many to control rises in the general price level which often trigger automatic wage adjustments resulting in further inflationary pressure. Increases in retail prices were particularly great in a few developing countries where strong inflationary pressures affected all items, but in most developing countries changes were also associated with developments affecting supplies of certain staple foods. Changes in relative prices of foods have a bearing on consumption patterns as rising prices of particular items may result in substitution of lower cost and, sometimes, less nutritious foods. With inflation, food prices normally rise along with those of other goods and services.

Prices in developed countries

In most developed countries the cost of living increased more rapidly in 1971 than in 1970, and the rate of increase was sometimes two or three times greater than during most of the 1960s. Action aimed at reducing demand pressure, including wage and price freezes, was taken by several countries for varying lengths of time and with varying degrees of success. In a number of countries the rates of price increases declined during the second half of 1971, and in others, particularly Italy, Japan, the United Kingdom, and the United States, demand management policies have become less restrictive in order to stimulate higher rates of economic growth.

Food prices rose more rapidly than the general index for all items in only about one third of the developed countries, but increases in most were still considerably above those experienced during the past decade, and in more than half the rate of growth increased over the previous year. The fastest price rises took place in Yugoslavia (22 percent), Israel (13 percent), the United Kingdom (11 percent), and New Zealand, Portugal and Sweden (each about 9 percent). In spite of slowing in certain countries in the latter part of the year, in each of these the increase was greater than in 1970.

In some cases increases were contained or reduced. In the United States, food prices rose by about 3 percent compared with 5.2 percent in 1970. However, prices of pork and beef continued to rise in spite of the August-November price freeze because of increases at the farm-gate level, reflecting reductions in pig production and slow expansion in beef output. In Japan, the increase was lowered to about 6 percent compared with 9 percent in 1970.

Although food price increases have less effect on household budgets in developed than in developing countries, where a large proportion of relatively lower income is spent on food, they still stimulate public concern over the effects of inflation on real income and wages, particularly in the case of fixed wage earners or pensioners.

The need to contain food prices also raises complex questions concerning agricultural protectionism, especially support prices for surplus commodities and the admission of low-cost food imports, as well as economic means for achieving social and other objectives for improving farm incomes.

Prices in developing countries

In the developing countries, cost of living and food price indices are generally compiled in large urban areas and based on the expenditures of wage earners. Consequently they do not reflect overall conditions in individual countries since large portions of the population live in rural areas and are sometimes outside the money economy. Moreover, there are

[18] See Annex table 6.

considerable differences in income levels and expenditure patterns between urban and rural areas.

The general price levels in developing countries continued to rise in 1971, often reflecting demand pressure associated with deficit financing for development and other projects and the need to mobilize limited resources. However, compared with developed countries, price increases were relatively less widespread. Upward price movements of more than 6 percent were reported for 18 out of 54 developing countries (33 percent), compared with 14 out of 25 developed countries (56 percent).

Food prices in urban centres in developing countries tended to rise more rapidly than the general price level, and increases of 6 percent or more were recorded in about half the countries. Because of the burden on household expenditure a number of governments have adopted price and income policies, as wage increases in certain sectors may affect the competitiveness of export products on the world market and damage balance of trade positions which in some cases are already precarious. Price controls may also be associated with the public distribution of essential items at subsidized prices.

Increases in food prices were particularly great in a number of Latin American countries, reflecting general inflation which in some cases was connected with social and political disturbances, but the effect on household budgets was less because of associated increases in money wages and income. The largest increases occurred in Argentina (about 42 percent), and Brazil, Chile, and Uruguay (each about 24 percent). However, in certain countries the rises were smaller than in earlier years as a result of stabilization measures. Large increases also took place in certain countries of the Far East, where war and other disruptive factors affected supplies of consumer goods. In the Khmer Republic, food prices rose by more than 100 percent in 1971 and mainly reflected changes in the price of rice, the production and distribution of which were disrupted by war. In Africa, the largest increases were in Nigeria (26 percent), where prices have grown rapidly following the civil war, and in Uganda (25 percent), where production of most food crops was reduced as a result of widespread drought and the rate of increase in food prices almost doubled.

The rate of increase in food prices is often more responsive to changing supply conditions in developing than in developed countries where the cost of the agricultural product represents only a small percentage of that of the finished product, as processing and distribution costs are often very important. In many developing countries the lower rate of increase in food prices in 1971 reflected improved supplies of staple commodities, particularly cereals, whereas in others price increases could be attributed to poor crops or an inadequate rate of growth in production. Little information is available on retail market conditions in developing countries, but among the countries with larger crops in 1971 food prices rose only slightly in India and Indonesia. In the former, prices of foodgrains declined, and the 1.5 percent increase in food prices reflects the significant proportion of consumer expenditures accounted for by foodgrains. In Indonesia, where rice accounts for almost 50 percent of total food expenditure, food prices increased by only about 3 percent compared with 9 percent in 1970, reflecting a record rice crop. In Ivory Coast, where rice is becoming a main food staple, 1971 food prices actually declined compared with a 13 percent increase the previous year, as a surplus of rice developed in 1970/71. However, in many countries the continued increase in food prices reflected difficulties in expanding output to meet the growing food requirements of the population.

Food and nutrition situation

The last comprehensive analysis of the world's food and nutrition situation was made a decade ago in FAO's third World Food Survey,[19] on the basis of food balance sheets for over 80 countries covering some 95 percent of the world's population, supplemented by information on food distribution among populations from surveys conducted in various parts of the world. The FAO survey presented data on levels in per caput food supplies and their nutritive value at the retail level by subregions and regions for three periods: 1934-38, 1948-52 and 1957-59. It tried to clarify particularly three points: the incidence of undernutrition,[20] the incidence of malnutrition[21] and the increase in world food supplies required to eliminate undernutrition and to gradually reduce malnutrition.

[19] FAO. *The third World Food Survey*. Rome. 1963. FFHC Basic Studies No. 11.

[20] Undernutrition means inadequacy in the quantity of the diet, i.e., calorie intake, which, continued over a long period, results in either loss of normal body activity or reduction in physical activity, or both. This definition is strictly appropriate to adults, not to children. For children, the consequences of low caloric intake are unsatisfactory growth and physical development and a reduction of the high degree of activity characteristic of healthy children.

[21] Malnutrition means inadequacy of the nutritional quality of the diet, which if made good enables a person to lead a healthy active life. More precisely it denotes inadequacy of a particular nutrient or several essential nutrients. Serious shortages of nutrients may result in clinical signs of deficiency diseases; minor degrees of deficiency can contribute to poor general health.

With respect to undernutrition the survey found that in 1957-59 per caput calorie supplies in the developing regions[22] fell short of corresponding requirements, as recommended in 1957 by the second FAO committee on calorie requirements,[23] by 7 percent. New techniques of analysis, based on the concept of variation in intake and requirement, were applied to data from household food consumption surveys available for a number of countries. Extrapolation of these data was achieved using individual country means and an assumed variance as the parameters of a log-normal distribution. The conclusion was that at least 20 percent of the population in these areas was undernourished. Taking into account the complicated methodological issues involved and the paucity of information available on the distribution of food supplies among the population, this led to the statement that between 300 and 500 million people were undernourished in this period.

The findings of the survey with respect to malnutrition were based on less firm grounds. In the absence of satisfactory information on the distribution of nutrient intakes and international requirement scales, the incidence of malnutrition was estimated on the basis of a general indicator of the nutritional quality of diets (i.e., the percentage of calories derived from cereals, starchy foods and sugar) using as the standard of reference the lower prevailing levels of this indicator in developed countries. Not surprisingly, therefore, much of the critical attention given to the survey centred around its finding that some 60 percent of the population in the less developed areas lived on diets which were inadequate in nutritional quality.

In order to provide a sufficient quantity of food for the growing population, and to meet progressively the needs of the vulnerable groups for a diet of a better nutritional quality, it was estimated that total food supplies of the developing countries covered had to be increased by 75 percent over the period 1965-80 and by 225 percent over the period 1965-2000.[24] The achievement of these targets implies annual rates of increase of 3.8 and 3.4 percent respectively. These estimates were obtained by using a linear programming model incorporating the target of an annual growth rate of 5 percent in GDP postulated as a minimum for the first United Nations Development Decade and linking this with the medium variant of the United Nations projections of total population as assessed in 1958.[25]

Since the preparation of the third World Food Survey no major advances have been made in the methodology for estimating the incidence of undernutrition, and further limited data that have become available on the distribution of calorie intake in relation to requirements broadly confirm the distributional characteristics observed earlier. Recently revised recommendations for calorie requirements[26] have not led to any significant changes in this situation. A more accurate appraisal should be possible through clinical and anthropometric surveys and an intensified programme of such surveys is badly needed, although their high cost must be weighed against the benefits. In any case clinical and anthropometric data of adequate volume will not be available for some time. In these circumstances it will not be inappropriate to judge recent changes in the incidence of undernutrition by the trend in per caput calorie supplies of the developing countries which, according to the latest data available, have experienced a modest increase since 1957-59.[27] This suggests a small decrease in the percentage incidence of undernutrition. If applied to the larger population of 1970, however, the lower percentage gives an estimate of absolute numbers involved which remain in the range of 300 to 500 million as reported above. The studies referred to reveal the following broad features of the trends in food supplies during the 1960s.

In developed countries there was a small increase in energy supplies per caput, and consumption reached — or must be close to — saturation level in most of them. Also in centrally planned countries, including the U.S.S.R., and developing countries, energy supplies appear to have slightly improved. Compared with 1965 (index 100), total supplies rose to 118 at the end of the decade, thus meeting population growth and giving a slight per caput improvement (index 104). The gains, however, were unequally distributed: almost zero in Africa and very limited in Latin America and the Near East (index 102). Significant increases of about 100 calories per head were achieved in Asia and the Far East (index 106) in the most highly populated regions where the situation was the most precarious.

In developed countries, total protein supplies per caput rose from 85.6 grammes in 1962 to 89.5 in 1970, an increase of 4 percent in eight years. This improvement was due to a rise in animal protein intakes of from 45.3 to 52.7 grammes, or 16 percent, more than offsetting a fall in consumption of vegetable protein. In the U.S.S.R. and eastern Europe,

[22] Comprising the countries of the Far East, Near East and Africa, and Latin America excluding Argentina, Paraguay and Uruguay.

[23] FAO, *Calorie requirements: report of the Second Committee on Calorie Requirements*. Rome, 1957. FAO Nutritional Studies No. 15.

[24] P.V. Sukhatme, D. Basu and W. Schulte, *Problem of population resources with special reference to land use and food supply*. Rome, FAO, 1969. ST/Misc/69/5.

[25] United Nations, *The future growth of world population*. New York, 1958. E.58.XII.2.

[26] FAO/WHO Expert Committee on Energy and Protein Requirements. Rome, April 1971. Report to be published.

[27] Estimates of trends in available food supplies in the period 1962-70 have been made using a series of food balance sheets for 1962 and 1965 and projected balance sheets for 1970. FAO, *1964-66 average food balance sheets*. Rome, and FAO, *Agricultural commodity projections, 1970-1980*, 2 v., Rome, 1971.

the same trends were even more marked. Animal protein consumption, relatively low in 1962, rose rapidly by 10 grammes per head (32 percent). The increase was of the same order for total proteins, from 83 to 93 grammes per person per day. The situation was quite different in the developing and in the Asian centrally planned countries. Total protein intake rose slightly, by about 1 to 3 grammes per head; there may have been no increase in Africa. Per caput consumption of staple foods rose slightly, improving both energy intake and vegetable protein intake. The most noteworthy performances were in Asia and the Far East (plus 2 to 3 grammes of vegetable protein per head) between 1965 and 1970, as the result of an increase in rice and, especially, wheat supplies. On the other hand, the relative per caput increase in supplies of pulses (index 103) was only half that of cereals. This tendency could lower the quality of the proteins in the diet. While in all developing regions the indices of intake of animal protein did tend to rise, the starting levels were so low that absolute increases were small and there was even a falling off in certain subregions of Africa. To sum up, over the 1960-70 decade a slight improvement took place in per caput consumption in developing countries, especially in Asia and the Far East, in regard to calories and vegetable protein. The differences in per caput consumption levels between the high-income and developing countries grew more for proteins and fats but, because the former countries were approaching per caput saturation levels, the disparity lessened slightly for calories.

The publication in 1965 of international recommendations for protein requirements,[28] and subsequent work by the Joint FAO/WHO Expert Committee on Nutrition leading to the meeting on requirements and recommended intakes for energy and protein,[29] have helped the more accurate assessment of malnutrition, particularly calorie/protein malnutrition. The data shown in Table 1-10 would suggest a considerable surplus of protein availability. However, food consumption surveys show a very uneven distribution of the protein supplies among populations, aggravated by seasonal imbalances in supply, caused by low incomes and other socio-economic and ecological factors, inadequate education in nutrition, disease and parasitic infestations, and waste. Equally important, proteins must not be viewed in isolation but rather as one of the many essential and correlated elements of human nutrition. Calories and proteins interact in a particularly striking manner. Very often diets are more deficient in calories than in proteins, with the result that proteins are diverted

TABLE 1-10. – PER CAPUT DAILY CALORIE AND PROTEIN REQUIREMENTS, 1970 LEVELS OF CONSUMPTION AND 1980 LEVELS OF DEMAND

	Per caput daily requirements [1]		Percentage of requirements			
			1970 consumption		1980 demand	
	Calories	Proteins [2]	Calories	Proteins	Calories	Proteins
		Grams				
World	2 385	38.7	101	173	105	178
DEVELOPED REGIONS	2 560	39.5	121	229	123	237
Developed market economies	2 555	39.2	119	228	122	237
Eastern Europe and the U.S.S.R.	2 570	40.0	124	232	126	238
DEVELOPING REGIONS	2 284	38.4	96	147	101	155
Asia and Far East [3]	2 223	36.6	93	141	99	150
Africa	2 335	41.5	93	141	98	149
Latin America	2 383	37.7	106	172	110	179
Near East	2 456	45.5	97	147	101	153
ASIAN CENTRALLY PLANNED ECONOMIES	2 355	38.3	88	153	93	163

SOURCE: FAO. *1964-66 average food balance sheets.* Rome, and FAO. *Agricultural commodity projections. 1970-1980.* 2 v., Rome, 1971. CCP 71/20.

[1] Revised standards of average requirements. – [2] Provisional data expressed in local proteins. – [3] Excluding Asian centrally planned countries.

from their primary functions of providing for growth and maintenance of tissues to the supply of energy for other vital functions. Thus the widespread incidence of protein/calorie malnutrition which, it is estimated, affects one quarter to one third of the population in many of the developing countries for which data are available.[30] This finding is confirmed by the results of clinical surveys in various parts of the world that point to the widespread existence of protein/calorie malnutrition, particularly among poor children under five years, and its adverse effects on physical and even mental development.

According to clinical surveys carried out between 1952 and 1966 in 26 countries, the prevalence of cases of moderate protein/calorie malnutrition (PCM) varied between 4.4 and 57 percent in children up to five years.[31] The available literature, covering 80 surveys in over 39 countries from 1966 to 1969, has been reviewed recently. The prevalence of severe cases of PCM (defined as cases of kwashiorkor and nutritional marasmus combined) in the limited surveys conducted in a few communities ranged be-

[28] FAO. *Protein requirements: report of a Joint FAO/WHO Expert Group.* Rome. 1965. FAO Nutrition Meetings Report Series No. 37.

[29] FAO/WHO Expert Committee on Energy and Protein Requirements. Rome. April 1971. Report to be published.

[30] FAO. *A statistical appraisal of the protein problem.* Paper presented at the fourth session of the FAO Statistics Advisory Committee of Experts. Rome. 15-23 September 1969.

[31] Bengoa. J.M. Priorities in public health nutrition problems. *Proceedings of the 7th International Congress of Nutrition. Hamburg. 1966.*

tween 0 and 7.6 percent in children below five years. Severe PCM has also been estimated from the percentage of children below 60 percent of the standard weight for a given age (third degree of malnutrition in the Gomez classification). These surveys show a range of severe malnutrition between 0.5 and 4.6 percent.[32] The prevalence of moderate cases was much higher, between 4.4 and 43.1 percent in children up to five years of age.[33]

Recent FAO studies on the size of future needs have been mainly based on demand projections under various assumptions for growth of population and income, that in certain cases were modified by nutritional considerations.[34] Although these studies differ in geographical and time coverage, their conclusion is that annual growth rates of around 4 percent in food supplies are required. This is also postulated in the strategy for the Second United Nations Development Decade.[35] Recent advances in improved varieties of cereals seem to have ensured that the achievement of such a rate is at least technologically possible in the medium term. The fact remains, however, that this rate is considerably higher than that achieved in the past by most of the countries concerned, and this emphasizes the importance of economic, social and institutional considerations. Neither must the need for simultaneous measures on the demographic side be overlooked for a balance between food and population in the long term.

[32] Bengoa, J.M. Recent trends in public health nutrition. *Proceedings of the 8th International Congress of Nutrition. Prague.* 1969.
[33] Joint FAO/WHO Expert Committee on Nutrition. Geneva. 1970.
[34] FAO. *Provisional Indicative World Plan for Agricultural Development*, 2 v., and *Provisional Indicative World Plan for Agricultural Development: summary and main conclusions*. Rome. 1970. – FAO. *Agricultural commodity projections. 1970-1980. op. cit.*

[35] United Nations. General Assembly, Resolution 2626 (XXV). *International development strategy for the second United Nations Development Decade*. New York. 11 November 1970.

Fisheries

Production and trade [36]

Strong demand and growing tightness of supplies in most markets for fishery products were dominant features in 1971. Landings of the countries reporting to FAO were slightly below the 1970 level and are estimated to have been 62 million tons (Table 1-11). The most significant change occurred in Latin America where landings were down by 11 percent. Global production value rose significantly, as prices of many items reached record levels, but net gains by producers were often not proportionate because of rapidly rising production costs.

A number of major fish-producing countries, as well as many developing countries with more modest fisheries, reported higher catches than in 1970. In Japan and Norway, the increase in catch value due to higher prices was considerably more important than volume gain. In Chile, the expansion of raw material catches was significant while the prices of meal and oil manufactured from these catches were actually lower than the year before. Peru, which reduced its catches of meal and oil raw material by almost one seventh, failed to follow the upward trend. The U.S.S.R. produced about as much as in 1970, while most other centrally planned countries increased their catches.

[36] For a detailed account of the fisheries situation see FAO, *Yearbook of fishery statistics. 1971*, Vol. 32. Rome, 1971.

TABLE 1-11. – ESTIMATED WORLD[1] CATCH OF FISH, CRUSTACEA AND MOLLUSCS

	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	....Thousand metric tons....					*Percent*
DEVELOPED COUNTRIES	24 620	25 820	24 950	26 110	26 670	+ 2
Western Europe	11 290	10 990	10 430	11 010	11 130	+ 1
North America	3 710	3 940	3 870	4 090	4 060	— 1
Oceania	150	160	140	160	180	+ 12
Other developed countries[3]	9 470	10 730	10 510	10 850	11 300	+ 4
DEVELOPING COUNTRIES	23 010	24 630	23 670	28 130	26 930	— 4
Latin America	12 820	13 640	11 920	15 470	13 700	— 11
Far East[1,4]	7 440	8 270	8 760	9 440	9 850	+ 4
Near East[5]	550	500	570	630	650	+ 3
Africa[6]	2 110	2 140	2 340	2 510	2 650	+ 6
Other developing countries[7]	90	80	80	80	80	—
CENTRALLY PLANNED COUNTRIES						
Eastern Europe and the U.S.S.R.	6 540	6 940	7 390	8 230	8 400	+ 2
World[1]	54 170	57 390	56 010	62 470	62 000	— 1

NOTE: Figures refer to the weight of the catch in metric tons. The annual changes in percentage terms may therefore differ considerably from those in Table 1-1, where the quantities of production are weighted by the unit values, as indicated in the explanatory note on page 166.

[1] Excluding China and other Asian centrally planned countries (catch estimated at 8 million tons). – [2] Preliminary. – [3] Israel, Japan, South Africa. – [4] Excluding Japan. – [5] Excluding Israel. – [6] Excluding South Africa. – [7] Includes developing countries in North America and Oceania.

TABLE 1-12. – INDICES OF THE VALUE OF FISHERY EXPORTS BY REGION

	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	... *1957-59 average = 100* ...					*Percent*
Western Europe	176	171	193	228	263	+ 15
North America	159	161	194	207	231	+ 11
Oceania	277	385	456	468	610	+ 30
Latin America	379	427	442	580	595	+ 3
Far East[2]	267	298	375	443	475	+ 7
Near East[3]	183	151	175	104	109	+ 5
Africa[4]	116	129	149	159	164	+ 3

[1] Preliminary. – [2] Excluding Japan, and China and other Asian centrally planned countries. – [3] Excluding Israel. – [4] Excluding South Africa.

Trade value continued its upward trend (Tables 1-12 and 1-13) in spite of a drop in shipments and a weakening of fish-meal and fish-oil markets, because of substantial increases in prices of fishery products for human consumption. With the exception of some further change in the distribution of Peruvian and Chilean exports of fish meal and fish oil which began in 1970, the main trade flows in fishery products remained substantially the same. In terms of value, shipments of fresh, frozen and canned fish products from one developed country to another continued to lead in importance. As in the past decade, developing countries dominated the export trade in crustacean products, fresh and frozen shrimp in particular, while Peru, Chile and Angola shared a large part of world markets for fish meal and fish oil with Norway, South Africa and Iceland.

As usual, the United States, Japan and western European countries absorbed a major part of fishery supplies in international trade. Japan's imports followed their remarkable climb of recent years, their value approaching the earnings of the country's fishery exports. United States and United Kingdom imports were smaller in volume than a year ago but higher in value, while the Federal Republic of Germany, ranking next to the United Kingdom among western European importers, reported increases in both volume and value of purchases. In most instances, greater changes in trade volume were accounted for by shipments of fish meal and oil, and the lower prices of these commodities had a depressing effect on trade value.

TABLE 1-13. – INDICES OF VOLUME, UNIT VALUE AND TOTAL VALUE OF WORLD[1] TRADE IN FISHERY PRODUCTS

	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	... *1957-59 average = 100* ...					*Percent*
Volume	160	171	168	174	178	+ 2
Average unit value	122	121	130	145	155	+ 7
Value	185	195	215	250	278	+ 11

[1] Excluding centrally planned countries. – [2] Preliminary.

MONETARY INFLUENCES ON DEVELOPMENT AND TRADE

Next to scarcity of supplies, inflation was among the more important factors in upward pressure on prices. Financial developments and the economic policies instituted by the United States in late summer 1971 influenced fishery industries in different degrees, depending on the change in a country's currency with respect to other currencies, the relative importance of foreign trade in fishery products and requisites, and whether it had a net export or import balance in the sector. On the whole, the United States import surcharge had a minor effect, as only those fishery items (about 50 percent) which were dutiable were subject to the surcharge, and since the maximum allowed duty was often less than the surcharge. Japan expected a reduction of its fishery exports following the revaluation of the yen. The latter was cited as a factor, together with the increase in Japanese purchases of shrimp, in the rise in the export price of Indian shrimp. Export-oriented industries of countries such as Peru, whose exchange rates for the United States dollar remained the same, expected some benefits, especially as far as shipments to European markets were concerned. The extent of repercussions on trade, however, is likely to become known only late in 1972. The devaluation of the Turkish lira in August 1970 was given as a reason for reduced 1971 imports of fishing requisites. High interest rates and stringent foreign exchange controls were other factors which had unfavourable consequences on fishery investment, especially by foreign interests, in countries with considerable fishery development potential, including some Latin American countries.

Policies and other issues

INVESTMENT, INDUSTRIAL DEVELOPMENT AND ORGANIZATION

Large-scale investments in fisheries were made or were under active consideration in many parts of the world, particularly in centrally planned eastern European and developing countries. The countries of eastern Europe, which have coordinated their

plans for fisheries development under the Council of Mutual Economic Assistance (CMEA), set a combined target for fish production in 1975 at from 13 to 14 million tons which, if attained, would probably place them in the lead in world production. The expansion, equivalent to about 50 percent of their combined 1970 output, was to be achieved by additional fleets of catcher, factory, and supporting vessels as well as by large investments in shore facilities and inland fisheries. The U.S.S.R. has recently constructed the largest factory ship in the world which, when in operation with its supporting vessels, will function as a sea-borne city.

Several developing countries have formulated ambitious new fishery programmes to be financially supported by government, international and regional development banking institutions as well as by private industry, including foreign companies. Peru plans to give emphasis to domestic food fish market development in a five-year programme (1971-76) budgeted at over U.S.$450 million, to be raised in almost equal proportions from public and private sources. An $85 million programme in Mexico, to be financed with Inter-American Development Bank assistance, will concentrate on training and the modernization of fleet and shore facilities. In India there has been growing recognition of the development opportunities in the Indian Ocean for deep-sea trawling operations. Large firms, including international corporations, were also motivated by the possibilities of obtaining essential foreign exchange allocations and the fact that for such operations it was not necessary to file applications for industrial licences.

Changes in the structure of fishing, fish processing and distribution operations were taking place everywhere in the world, some due to natural evolutionary processes and others as a consequence of specific improvement programmes. Some developed countries sought to guide investments away from operations of diminishing profitability into more promising channels by support and regulatory measures. Japan and the United Kingdom, for example, were building fewer long-distance deep-sea vessels in 1971; others, like the Federal Republic of Germany, were converting older and unprofitable freezer vessels for middle-distance operation or were replacing small unmotorized craft with larger, engine-powered vessels. Other means to increase efficiency and to compensate for decreased resources included: consolidation of enterprises (in the Federal Republic of Germany, Portugal and Spain, among others), measures to obtain a better balance between fishing and fish handling and processing operations (in several Latin American countries, including Peru), and improvement in the deployment of fishing fleets through centralized planning and better ship-to-shore communications. In several developed countries, for example the Federal Republic of Germany and the United Kingdom, the number of distribution agents declined because of consolidation measures (bringing about an increase in the volume handled per outlet) and prevailing market conditions. Structural reforms were also instituted in several developing countries, for example in Senegal, in the modern sector of the fishing fleet, and in Taiwan, where economic difficulties in recent years were blamed in part on the small size and weak capital structure of fishing companies and the lack of organized marketing channels.

Processing establishments in some countries were in difficulties because of raw material problems. In India, much of the small shrimp traditionally used for canning was being frozen because of the strong export demand for frozen shrimp. In Morocco, poor catches in the coastal fishing caused difficulties in the sardine canning industry and made it necessary to plan for a shift to high seas fishing.

Several countries reported that rising costs in the construction and operation of facilities seriously hampered new investment and modernization programmes. In other countries, the increase in the value of landings appeared to be more than sufficient to cover planned expenditures.

Measures for the protection of fishery resources and human health

Operations and landings in many countries were increasingly affected by scarcity in important marine fisheries. Concern over this trend resulted in new measures aiming at a reduction of fishing pressure on threatened resources. A new management agreement (not yet ratified) covering the previously unregulated herring fishery of the northwest Atlantic, which was reached by the member countries of the body concerned with fishing in this area in early 1972, was of special note since, for the first time in the history of any fishery in which a large number of nations participate, national quota allocations were negotiated. A convention to conserve the living resources of the southeast Atlantic Ocean came into force in October 1971. The new treaty, drafted under FAO auspices, provides for the establishment of the International Commission for the Southeast Atlantic Fisheries which will undertake studies and make recommendations for the rational exploitation of the area. The immediate consequence of new management action was a catch decrease in some fisheries, including those for North Sea herring and certain groundfish resources in the northwest Atlantic area.

Resources protection measures were instituted also at the national level. Regulations on the exploi-

tation of coastal shrimp resources were put into force by many developing countries, and measures to protect the physical environment, including the habitat of fishery resources and man, from the effects of pollution. There were new United States legislative provisions which, *inter alia*, barred United States citizens from whaling, prohibited the import of whale products, and conferred authority on the President to stop fishery imports from countries conducting fishing operations considered to be in violation of multinational conservation programmes in which the United States participated. A bill, not yet enacted, provides for quality control measures on fishery imports, which could lead to repercussions not only on trade, but also on the fishing operations of developing countries. Trade and profitability were also influenced by the rejection, on the part of major fish-importing countries like the United States, the Federal Republic of Germany, and Italy, of some fishery imports (for example, canned tuna) on the grounds of excessive mercury contamination. However, fear of pollution damage had less impact on markets than had been expected a year ago.

Official concern with the environment was illustrated by the approval of a draft convention prohibiting the disposal of poisonous wastes in the northeast Atlantic by the 12 countries directly concerned. In Canada, an environment department was established. The new department, originating with the former Department of Fisheries and Forestry, also includes the principal agencies concerned with the quality of water and air.

Fishing limits

Promulgation of new national fishing limits by a number of countries, as well as attempts to enforce claims to expanded fishing zones made in earlier years, also influenced marine fisheries to a substantial extent. Enforcement efforts resulted, in some instances, in the seizure of vessels. New claims, whether internationally recognized or not, spurred numerous bilateral agreements for the preservation of traditional fishing rights. Where countries found themselves barred from grounds they had previously exploited, fishing operations were redirected to other areas, in some instances increasing pressure on already heavily fished resources. Developing countries which claimed new exclusive fishing zones or discontinued the licensing of foreign operations in their territorial waters were not always in a position to enter the fisheries with their own fleets, or did not do so for conservation purposes. This led to catch reductions in some of the areas affected. New licence fees for fishing rights had a similar effect, insofar as they were considered too high by interested foreign operators.

Developing countries sought increased recognition of their interests in multinational fisheries arrangements. Larger national quotas, for instance, were demanded by several Latin American countries participating in the Inter-American Tropical Tuna Convention.

Economic cooperation and integration

The most important event in regional economic integration of recent months has been the successful conclusion of negotiations between the European Economic Community and the four applicant countries on the treatment to be accorded to fisheries. This removed the last obstacle to entry. Under the agreement, member states of the Community were to be permitted to restrict fishing in specified coastal waters until the end of 1982; the question of arrangements to follow thereafter would be taken up later by the expanded Community. Modifications to Community rules on fish marketing, to take account of special circumstances in the applicant countries, were also approved.

The new EEC fishery policy does not appear as yet to have had a significant impact on fish production and trade, nor are there reasons for expecting a major reorientation of trade flows in the expanded Community, at least not as long as supply and market conditions in Europe and North America remain as they were in 1971. Within the Community, some shift in utilization is likely, with more emphasis on production of frozen than cured products. The opportunity for closer cooperation by the member countries may produce fringe benefits in regional negotiations on resources management.

In other regions, efforts to strengthen intercountry ties included the preparation of plans for joint investments, investigations of the feasibility of establishing multinational fisheries companies and promotion of joint research activities. Prominent among the sponsors of such programmes in recent months — apart from intercountry bodies concerned with economic integration and trade liberalization, and the regional commissions of the United Nations — were a number of regional fisheries commissions, including some established under the aegis of FAO such as the Indian Ocean Fisheries Commission.

National support policies

In most developed countries, favourable market trends made it possible to reduce direct aid to the industry and to give increased emphasis to social security and measures promoting structural reform. Temporary assistance was instituted in some instances, for example in the Swedish herring fishery to com-

pensate for catch bans. In the United States, the owners of fishing boats seized on the high seas received reimbursement from a fund to which they contribute. Although loan and mortgage insurance programmes were continued for United States fishing vessels, the construction subsidy programme was being phased out. In the United Kingdom, operational subsidies were reduced because of the rise in vessel profits. In Finland, seasonal price support, as well as help in transporting local catch surpluses to other areas, contributed to the stabilization of herring markets. In Belgium, a national minimum price scheme for stabilization of fishermen's prices was discontinued as the EEC scheme came into force in September 1971.

In Sweden, assistance was provided to enable fishermen at the economic margin to shift to other occupations. Social security received increasing attention in Norway. In the Netherlands, financial support was given for pioneer expeditions to new fishing areas. Structural reform continued to be a major objective in the fisheries policy of the Federal Republic of Germany.

In some developing countries where fisheries are an important sector of the economy, the state assumed a larger role in their effective control. A comprehensive fisheries law gave the Peruvian Government full authority to develop the industry according to new priorities in the national interest. In Chile, nationalization of fisheries is the objective of new policies. New development agencies for fisheries were created (for example, in Malaysia) and existing agencies (such as the State Fishing Corporation in Ghana) revitalized, to conduct fisheries operations on their own account and/or stimulate private initiative.

Improved provision of craft and gear and other fishing requisites was an important aim of fishery support policies in many developing countries. Pakistan granted customs exemption on fishing gear imports. India gave permission to import two vessels if one vessel were bought locally. On the other hand, in Turkey an act exempting fishing equipment from import duty was abolished and interest rates on loans by official banking sources were increased.

Bilateral and multilateral assistance

Fisheries assistance programmes in a number of developed countries continued to expand. The tendency to transfer technical supervision of projects to international agencies such as FAO became more pronounced, and improved coordination between bilateral and multilateral assistance, as well as the new United Nations Development Programme (UNDP) country programming procedures, enhanced the effectiveness of aid machinery. Arrangements for aid or cooperation in fishery projects of mutual interest between developing countries multiplied. There were not only agreements between neighbouring countries (the Libyan Arab Republic and Tunisia) but also between countries far apart, such as the Republic of Korea and Ecuador, where one of the partners was able to offer the experience, for example in fishermen's training or exploratory fishing operations, needed by the other. Centrally planned countries were also active in giving technical assistance and in return were often able to obtain facilities for the servicing of their long-distance fishing fleets.

Manpower problems

Several developed countries experienced difficulties in finding qualified recruits for technologically advanced operations and in accelerating the retirement of fishermen of limited skill engaged in fishing that is no longer viable. In all the major developed fishing countries manpower for fishing has been decreasing for years. This has led to serious crewing problems in, among other countries, Japan, the Federal Republic of Germany and Canada. Increased importance was given to the improvement of social conditions in the sector. In Peru, new legislation provided substantial benefits, not only in terms of wage increases, but also through new obligations on employers to construct school facilities where no state schools exist, by ensuring financial participation of the fishermen in the ownership of fishing enterprises, and through the enforcement of improved working standards and rules. In one country, owners claimed that social contributions had reached a level that made it uneconomic for them to continue trawler operations requiring large crews.

Labour strikes in the fisheries sector were relatively rare and not protracted. Of more serious consequence for the industry were dock strikes in late 1971 in the United States which disorganized normal distribution and discouraged imports, accentuating an already tight fish supply situation in domestic markets.

Education and training

Lack of personnel at all levels necessary for the promotion of fisheries development, in both government and private sectors, persuaded most developing countries to assign top priority to education and training. An increasing number of national and foreign technical assistance programmes focused on this area through the organization of training cen-

tres, seminars, fellowships and study tours. Much progress has been made, but much remains to be done. The known tenacity of fishermen to cling to traditional ways makes it necessary to harmonize technological advances and training with ability and willingness to accept change.

DEVELOPMENT PLANNING

Programmes for expanded aid to small-scale (artisanal) fisheries in developing countries were giving more attention to integrated projects for technical improvement and training which also provide for community development.

Developing countries ready to launch industrial-scale operations experienced difficulties in mobilizing sufficient capital and skilled labour locally but the most serious handicap, as a rule, was a lack of entrepreneurship. Many of these countries, therefore, in particular on the west coast of Africa, were interested in entering joint ventures. Fishery companies in developed countries also showed interest in such ventures as a way of extending their operations to new areas and improving their supply. However, most of the new ventures formed recently, for example the numerous shrimp operations entered into by Japanese interests in all developing regions, have been related to luxury commodities, and foreign aid for larger scale enterprises for supply to domestic markets remained scarce in developing countries.

Outlook

Food fish markets can be expected to remain strong over the short term. Signs of weakening in retail for frozen fish staple products in the United States and in wholesale markets for shrimp in Japan may be temporary. Supply tightness is likely to increase rather than relax and fishery products, as shown by relative price trends, continue to register gains in consumer popularity over competitive products. Economic controls in the United States may help to prevent price inflation from reaching a level that would tend to provoke buyer resistance.

Markets for fish meal and oil may well expect a period of increased stability. Downward pressure on prices, attributable to the large stocks of meal in the principal producing countries, could be offset by developments in end-use markets, such as the increase in broiler production in the United States, and a favourable change in the price ratio of fish meal to competitive feed ingredients. Attempts by major producers to relate output to market needs, and the development of new markets in countries whose previous trade in fish meal was insignificant are other elements that may lessen the severe fluctuations in fish meal prices of recent years.

Forestry

Production and trade

World roundwood production has continued to grow (Table 1-14) although more slowly than in previous years due to a standstill in pulpwood output. The output of logs for plywood and sawnwood manufacture increased largely because of the rapidly growing demand for these products in North America. Indonesia accounted for a large share of the increase in roundwood production in developing countries. The lowest figure was registered in western Europe where production fell by 3 percent. Production of industrial roundwood is still heavily concentrated in the industrialized regions, which accounted in 1971 for about 90 percent of the world total.

World production of sawn hardwood in 1971 is estimated to have remained near the 1970 level of approximately 97 million cubic metres. Output fell for the second year in succession in North America, as the recovery in demand as usual lagged well behind that of sawn softwood.

Increasing forest production remained the fundamental objective of forestry programmes, policies and institutions. In the developed countries, espe-

TABLE 1-14. – INDICES OF WORLD[1] ROUNDWOOD PRODUCTION, BY MAIN COMMODITY GROUPS

	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	...1961-65 average = 100...					*Percent*
Logs	105	109	110	112	114	+ 1.7
Pulpwood and pitprops	116	114	124	134	134	+ 0.5
Other industrial wood	126	130	125	129	127	— 1.0
ALL INDUSTRIAL WOOD	109	112	114	117	119	+ 1.2
Fuelwood	104	104	105	106	106	+ 0.8
TOTAL ROUNDWOOD	108	110	112	114	116	+ 1.1

[1] Excluding China and other centrally planned Asian countries. – [2] Preliminary.

TABLE 1-15. – INDICES OF WORLD[1] TOTAL ROUNDWOOD PRODUCTION, BY REGION

	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	...1961-65 average = 100...					Percent
Western Europe	104	100	106	113	110	— 2.7
North America	108	113	115	116	119	+ 3.1
Oceania, developed	108	112	115	119	119	—
Other developed market economies[3]	105	98	95	92	90	— 2.2
DEVELOPED MARKET ECONOMIES	106	108	110	113	114	+ 0.9
Latin America	111	114	117	121	125	+ 2.5
Far East[4]	117	122	128	130	133	+ 2.4
Near East[5]	122	126	133	136	138	+ 1.0
Africa[6]	114	116	121	122	124	+ 1.5
DEVELOPING MARKET ECONOMIES[1,7]	115	118	123	126	128	+ 2.0
Eastern Europe and the U.S.S.R.	103	104	103	106	106	+ 0.4
World[1,7]	108	110	112	114	116	+ 1.1

[1] Excluding China and other centrally planned Asian countries. – [2] Preliminary. – [3] Israel, Japan and South Africa. – [4] Excluding Japan, and China and other centrally planned Asian countries. – [5] Excluding Israel. – [6] Excluding South Africa. – [7] Including Oceania developing, not shown separately.

cially, these aim at improved operational efficiency through mechanization and worker training. A trend toward a full-time, permanent labour force and a corresponding reduction in the employment of seasonal labour is also a factor contributing to increased efficiency and productivity.

In Sweden productivity rose, as the average number of man-days required for the production of 1 cubic metre of roundwood was reduced from 0.3 in 1967 to 0.22 in 1970. In the Federal Republic of Germany, labour input decreased by nearly 10 percent from 1967 to 1970. However, labour cost has increased by some 45 percent, and the present ratio between labour and equipment is 70 to 30. Further mechanization is expected to reduce the labour component of costs to 50 percent.

The fragmented nature and small size of forest holdings in most European countries seriously handicap progress in the rationalization of operations. The bringing of larger forest areas and groups of holdings under unified management is therefore being pursued. To facilitate increased mechanization, the consolidation of holdings into larger operational units and the development of better forest road networks are necessary. The Scandinavian countries have a tradition of cooperation among private forest owners which has led to more efficient methods in the management, harvesting and marketing of wood.

Administrations in virtually all the countries of Africa and the Far East with important forests continue to give close attention to two major problems relating to the development of these resources for export. Logs continue to form the bulk of total tropical hardwood exports, and in the case of African and some Far East countries the number of species being exported in large quantities is small in relation to the numbers growing in the forest. Policy objectives are therefore to extend the range of exports in two directions: to sell processed products (sawnwood, veneers, plywood, furniture parts, etc.) of higher unit value, and to sell more species. This will require considerable investment, mainly foreign, in equipment and manpower, and the development of markets in the industrialized countries for new species and products manufactured from them. This strategy has now to be combined with the increasingly important one, overlooked in some countries in the past, of preserving the ecological balance in the forest areas under exploitation.

In this context, it is interesting to note that the United Nations Development Programme (UNDP) has approved preliminary action for the first global forestry project: the Tropical Timber Bureau. Its objective is to assist developing countries to increase their foreign exchange earnings from exports of tropical woods and wood products. The project will be primarily concerned with the overriding problems of identifying, harvesting, processing and marketing lesser known species with due regard to proper forest management and conservation of the environment. At the end of 1971, 52 UNDP Special Fund-assisted forestry projects were operational, with a UNDP Special Fund contribution of about U.S.$47 million, spread over an average project duration of four to five years.

Growth in production and trade of forest products was generally slow and unbalanced in 1971. For most products, particularly pulp and paper, developments were disappointing because of rising production costs and the rather depressed market situation prevailing in the main consumption centres. There was a further appreciable slowing down in economic growth in the industrial countries of western Europe, while in Japan expansion was less than half the long-term average. The recovery in North America from the 1970 economic stagnation was both longer in coming and slower than widely expected, but demand for sawnwood and wood-based panels increased with the recovery and subsequent boom in construction in the region.

Toward the end of the year there was more demand for a wider range of forest products, often accompanied by slightly higher prices. While prospects are

TABLE 1-16. – INDICES OF THE VALUE OF FORESTRY IMPORTS AND EXPORTS, BY REGION

	Imports						Exports					
	1967	1968	1969	1970	1971[1]	Change 1970 to 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	..... 1957-59 average = 100					Percent	..... 1957-59 average = 100					Percent
Western Europe	173	189	219	248	236	— 5.1	143	160	182	207	203	— 2.2
North America	139	161	180	165	189	+ 14.6	155	179	202	218	223	+ 2.2
Oceania	133	142	150	171	162	— 4.9	222	317	372	423	458	+ 8.3
Other developed market economies[2]	574	704	786	957	885	— 7.5	140	167	179	167	178	+ 6.2
DEVELOPED MARKET ECONOMIES	179	202	229	249	247	— 0.6	149	170	192	213	213	+ 0.2
Latin America	107	127	145	175	184	+ 5.4	127	158	170	154	170	+ 10.6
Far East[3]	253	320	359	414	454	+ 9.7	414	531	654	790	870	+ 10.1
Near East[4]	154	147	209	233	249	+ 6.9	233	177	205	178	168	— 5.1
Africa[5]	97	105	119	154	167	+ 9.0	192	224	268	246	256	+ 4.0
DEVELOPING MARKET ECONOMIES	145	170	198	234	252	+ 7.6	254	316	379	416	452	+ 8.8
ALL ABOVE REGIONS	174	198	226	247	248	+ 0.3	159	184	210	231	235	+ 1.7
Eastern Europe and the U.S.S.R.	188	204	238	286	304	+ 6.4	227	250	276	302	299	— 0.9
World[6]	176	199	227	249	253	+ 1.3	168	191	216	240	243	+ 1.2

[1] Preliminary. – [2] Israel, Japan and South Africa. – [3] Excluding Japan, and China and other centrally planned Asian countries. – [4] Excluding Israel. – [5] Excluding South Africa. – [6] Excluding China and other centrally planned Asian countries.

more promising in international markets, the industry is facing new problems in environment protection and trade barriers, in addition to the current problems of rising production costs and depressed markets which continue to prevail, aggravated by inflation. Technical and economic efforts have to be made in the field of environment protection, particularly by the pulp and paper industry, with emphasis on pollution control and the increased recycling of return fibres. Several countries are faced with new trade barriers.

The developing countries have increased their exports of forest products at a much higher rate than imports. The value index for exports reached 452 (1957-59 average = 100) in 1971, while the index for imports was 252. The developed countries were not similarly successful with their relative expansion of exports, as growth of exports and imports has been almost equal.

It may be assumed, moreover, that in developing countries unit values for exports and imports of forest products have increased at the same pace. The respective increases in value indices are in fact about two points higher than the volume indices in 1971 (Tables 1-16 and 1-17).

Average export unit values (Table 1-18) give only a very broad indication of price developments, mainly because of the many possible changes in the composition of trade with regard to product type and product quality. Recently, the situation in international currency exchange and the prevailing inflation have added to these uncertainties. However, the export unit value indices in Table 1-18 underline the considerable pressure on trade in pulp and paper — and to a somewhat lesser extent in wood-based panels — in 1971.

The steep rise in world roundwood trade reached its peak in 1970 with a value index of 431 above the 1957-59 average, or a growth of 331 percent in 13 years (Table 1-19). This fast development was interrupted in 1971, when exports remained at practically the same level. Trade in the different roundwood products has varied considerably. Declines in softwood logs, pulpwood, pitprops, and piles and posts were compensated by substantial increases in trade of broadleaved logs. These increases are to be largely attributed to the rapidly expanding log exports from Kalimantan in Indonesia, which in one year rose by 4 million cubic metres, mainly destined for Japan. This phenomenal rise was partly offset by a decline of more than 1 million cubic metres in log exports from the Philippines, where strenuous efforts are being made to bring logging operations under firmer forest management while allocating a larger share of total removals to local industries and less to export.

After falling in 1970 in the wake of reduced buying from Europe, African roundwood production, mainly

TABLE 1-17. – INDICES OF THE VOLUME OF FORESTRY IMPORTS AND EXPORTS, BY REGION

	Imports						Exports					
	1967	1968	1969	1970	1971[1]	Change 1970 to 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	..... *1957-59 average = 100*					*Percent*	..... *1957-59 average = 100*					*Percent*
Western Europe	167	186	203	215	203	— 6.0	146	164	179	186	180	— 3.1
North America	146	162	175	166	185	+ 11.3	166	181	195	207	202	— 2.3
Oceania	136	147	150	162	152	— 6.6	225	315	339	364	380	+ 4.5
Other developed market economies[2]	492	585	629	731	662	— 9.4	132	152	159	153	159	+ 3.6
DEVELOPED MARKET ECONOMIES	174	195	212	220	216	— 1.6	156	173	187	196	192	— 2.5
Latin America	112	129	135	155	161	+ 3.9	129	155	150	155	157	+ 1.1
Far East[3]	226	286	307	329	354	+ 7.3	358	475	549	607	666	+ 9.7
Near East[4]	152	143	196	214	218	+ 1.7	208	159	170	145	134	— 7.7
Africa[5]	94	100	106	134	142	+ 5.4	168	194	220	206	207	+ 0.6
DEVELOPING MARKET ECONOMIES	141	163	179	200	210	+ 5.0	225	284	319	335	357	+ 6.5
ALL ABOVE REGIONS	170	191	208	218	216	— 0.9	162	183	199	209	207	— 1.1
Eastern Europe and the U.S.S.R.	185	198	221	252	263	+ 4.4	230	243	248	261	250	— 4.0
World[6]	171	191	208	220	219	— 0.4	171	192	207	217	215	— 0.9

[1] Preliminary. – [2] Israel, Japan and South Africa. – [3] Excluding Japan, and China and other centrally planned Asian countries. – [4] Excluding Israel. – [5] Excluding South Africa. – [6] Excluding China and other centrally planned Asian countries.

of broadleaved logs in west Africa, stabilized in 1971. Renewed interest by European buyers toward the end of the year encouraged concession holders to raise their logging programmes, but in several countries the economically accessible reserves of the commercially popular species are becoming scarce, and customers have increasingly to choose between paying high prices for these or buying alternative, lesser known species. Log exports from Ivory Coast increased by almost 20 percent, but there was little or no change reported from the other west African log-exporting countries. Stock shortages of some species occurred at the export ports toward the end of the year as buyers, who had been following a cautious buying policy, found themselves with reduced stocks. Prices for logs of some species, notably sipo, showed considerable increases at the end of 1971 and in the early months of 1972.

By the end of 1970 large pulpwood stocks had accumulated in Europe because of the recession in the pulp industry. Although imports continued to rise in the first months of 1971, a slump followed and for the year western Europe's total imports fell by some 2.4 million cubic metres or 17 percent compared with 1970. There was a similar but less severe drop in imports of coniferous logs.

Japan increased its roundwood imports by nearly 6 million cubic metres in 1970, but consumption was

TABLE 1-18. – INDICES OF WORLD[1] AVERAGE EXPORT UNIT VALUES OF FOREST PRODUCTS

	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	... *1957-59 average = 100* ...					*Percent*
FOREST PRODUCTS	98	99	105	110	112	+ 2
Roundwood (excluding fuelwood)	115	115	118	127	129	+ 2
Processed wood	100	106	116	117	122	+ 4
Wood-based panels	95	96	102	108	110	+ 2
Pulp and pulp products	93	93	96	103	103	+ 1

[1] Excluding all centrally planned countries. – [2] Preliminary.

TABLE 1-19. – INDICES OF THE VALUE OF WORLD[1] EXPORTS OF FOREST PRODUCTS, BY MAIN COMMODITY GROUPS

	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	... *1957-59 average = 100* ...					*Percent*
Roundwood (excluding fuelwood)	270	322	367	431	430	— 0.3
Processed wood	140	163	181	190	206	+ 8.2
Wood-based panels	242	295	336	367	409	+ 11.5
Pulp and pulp products	155	169	192	216	206	— 4.8

[1] Excluding China and other centrally planned Asian countries. – [2] Preliminary.

slower and consequently stocks were heavy at the end of 1970, especially of coniferous logs. In 1971, exports of coniferous logs from the United States to Japan fell by roughly 2.4 million cubic metres, due not only to reduced Japanese demand but also to improved domestic demand in the United States and delays caused by dock strikes. Japanese imports of coniferous logs from other sources, mainly the U.S.S.R., in 1971 were little changed from 1970, but there was a further rise in imports of hardwood logs of about 1 million cubic metres. Indonesia's exports to Japan, as well as to other Far East importing countries, notably the Republic of Korea, continued their dramatic rise, and the country became a leading world exporter of hardwood logs in 1971.

Statistics on international trade in wood chips for pulping are not yet comprehensive, but it is estimated that in 1970 the volume involved was of the order of 7.5 million solid cubic metres. The bulk of this trade (nearly 70 percent) took place between two countries, from the United States to Japan, with the mainly coniferous chips being transported in specially designed bulk carriers. Japanese importers, however, have been actively seeking new sources of supply, and this is reflected in the changed pattern of its imports in 1971 compared with 1970. According to unofficial data, Japan imported 5.9 million cubic metres of chips in 1971, 900 000 more than in 1970. The most interesting development was the growth in imports of hardwood chips, by nearly 600 000 to a total of 1.2 million cubic metres, the main suppliers being, in order of importance, Australia (eucalypts), West Malaysia (rubber wood) and Sarawak (mangrove).

There is also a large flow of chips from Canada to the United States, but trade elsewhere in the world is as yet unimportant. European imports in 1970 are estimated to have been about 500 000 cubic metres. However, in view of the current interest being shown in the possibilities of wood chips, it seems likely that international trade may expand in the future.

Sawnwood

Trade in processed wood — comprising coniferous and broadleaved sawnwood, and sleepers — rose by 8.2 percent in 1971 (Table 1-19), and so maintained the annual growth rate of 5 to 10 percent of recent years. Sawn softwood exports, representing the largest single item in overall forest products trade, rose somewhat faster than exports of sawn hardwood, while trade in railway sleepers remained slightly below the average.

The greatest increase in sawnwood production was reported from North America, where coniferous sawnwood alone rose by approximately 13 million cubic metres. Aided by falling interest rates and increased availability of credit, the tempo of dwelling construction activity rose throughout 1971 and into the first months of 1972, when it was approaching record levels.

Intra-North American trade in sawn softwood also rose strongly but, mainly because of high demand and prices in the United States, Canadian exports to Europe fell considerably. North American exports to Japan slumped, partly for the same reasons and partly because of weaker demand in Japan.

Dwelling construction in Japan levelled out in 1971 after rising strongly in previous years and this, coupled with high end-1970 stocks, led to the sharp fall in imports from North America.

In western Europe, dwelling construction rose by 3 to 4 percent in 1971. The sawn softwood market, however, appeared to be more affected by the slowing down of the overall economy and, after continuing to expand in the first half of the year, levelled out, with production and trade even showing a slight downward trend. Availabilities of sawn softwood were high in the exporting countries during the year, resulting from mild weather during the 1970/71 winter which did not disrupt the supply of logs or activity in the sawmills.

Production and trade data for 1971 from the U.S.S.R. are not yet available, but on the basis of importers' figures it appears that its exports of sawn softwood to western Europe fell and that this decline was only partly offset by increases to eastern Europe and other markets. One problem to which U.S.S.R. exporters have been giving great attention is the slower rate at which they have been able, up to the present, to install equipment for the packaging of sawnwood for export, compared with their competitors in northern Europe. Such has been the development of packaging in Europe in the last three or four years that importers in western Europe are less and less able to accept loose sawn softwood, because of dock labour shortages.

By the end of 1971 low stocks of sawn hardwood and signs of a pick-up in demand from the furniture and other user industries suggested a recovery in 1972. Imports in North America partly recovered in 1971 from their steep fall in 1970.

Levels of production, trade and consumption of sawn hardwood in Europe in 1971 were not very different from those of 1970, with some growth in the first half of the year being counterbalanced by a decline thereafter, in line with the slowing down of the overall economy. European buying from west Africa was somewhat lower than in 1970. In 1970, Europe obtained well over half its total supplies of tropical sawn hardwood from two countries, Malaysia and Singapore, whose exports to Europe had risen

very considerably since 1967. This trade levelled out, however, during 1970 and, according to incomplete information, there was little change in 1971.

Wood-based panel products

The wood-based panel trade continued its spectacular growth, rising by 11.5 percent during 1971 (Table 1-19). Particle board alone, with an increase of more than 25 percent, accounted for a large part of this expansion. World trade in veneers also expanded at a similar pace, but at a much lower level with regard to quantity. About half the world's veneer trade is now originating from developing countries. This is also true for the plywood trade, which continues to grow rather slowly, but still at a much faster rate than fibreboard, which registered only a very modest increase in 1971.

In North America, the booming construction sector had a stimulating effect on consumption, production and imports of plywood in 1971. Production there is estimated to have risen by nearly 2 million to 18 million cubic metres, easily a new record level, out of an increase in world production provisionally put at a little over 3 million to nearly 36 million cubic metres. North America thus retained its more than 50 percent share of the world production total.

The principal share of production in North America consists of softwood plywood, which accounted for most of the growth in 1971. The region's imports, however, are mainly of hardwood plywood. Tropical plywood accounted for virtually the whole of the increase in world exports of plywood in 1971, growth in the exports of the Republic of Korea, Malaysia and Singapore being particularly noteworthy. As for sawn hardwood, the European plywood market showed no major change in 1971 compared with the previous year.

World production of particle board continued to expand rapidly in 1971, output of wood particle board being estimated to have reached about 23 million cubic metres, or 20 percent more than in 1970. Production of nonwood particle board, mainly flaxboard in Europe, would add more than 1 million cubic metres to the above total. Particularly strong growth in production of wood particle board is reported from North America, and output in the United States has now outstripped that in the Federal Republic of Germany which, since the original introduction of this product after the second world war, was the world's leading producer. In contrast to the slowing down or decline in production of virtually all other products in Europe in 1971, that of particle board rose slightly faster than in the previous year. A large volume of new capacity has come on-stream over the past two years and it appears that growth in 1971, in Europe and perhaps other areas, was "production-pushed" rather than "demand-pulled." This is borne out by the fact that prices were under considerable pressure.

World production of fibreboard continued its slow growth in 1971 passing, according to provisional figures, 8 million tons. There was a strong recovery in North America, once again mainly due to demand from the construction industry, while growth continued relatively strongly in eastern Europe and the U.S.S.R. In western Europe, production remained stable for the region as a whole. Apart from a partial recovery in North American imports of fibreboard in 1971 after the steep fall in the previous years, no major changes occurred in trade last year.

Pulp and paper

Trade in pulp and paper has been hardest hit by the worldwide economic stagnation. Between 1970 and 1971 the total value of exports fell by 4.8 percent (Table 1-19). Toward the end of the year there was a slight recovery in demand for certain grades used for packaging. However, printing and writing papers, including newsprint, are still under pressure.

Trade in market pulp, both mechanical and chemical, decreased substantially between 1970 and 1971. Toward the end of the year, however, there were signs of a reviving market for chemical, particularly bleached sulphate, pulp.

Pulp and paper account for a major share of the developing countries' imports of forest products, and make up for the large export surplus earned in the wood products sectors. Growth of pulp and paper imports has been above world average in the Near and Far East. It is interesting to note in this context that unit value indices for pulp and paper imports by these regions have remained virtually unchanged since 1957-59.

International trade in wood pulp underwent some major changes in 1970 and 1971. In the case of mechanical pulp, world trade had remained for many years within a fairly narrow range of between 1.2 and 1.4 million tons (export figures) up to and including 1970. In 1971 there was a marked fall, notably in western Europe, where exports of 770 000 tons were 26 percent lower than in 1970 and the lowest since 1952. The immediate reason for this slump was the cut-back in the purchasing of pulp and the production of paper by industries in the importing countries. There is reason to suppose, however, that trade in mechanical pulp may continue to decline over the long term as manufacture of its principal product, newsprint, is moved back closer to the sources of raw material and away from the main consumer countries.

The pattern of trade of chemical pulp is more diversified, and there are a greater number of grades

and qualities. Thus, although trade in chemical pulp suffered a sharp setback in 1971 in western Europe where imports fell by 19 percent, and in Japan where they fell even more sharply, this was partly offset by some recovery in North American imports. In 1970, the North American pulp and paper market was in the middle of a recession, and a considerable surplus of pulp, some of it coming from integrated industries that could not use all of it themselves, was put on the international market. Consequently North American exports, notably those from the United States to western Europe and Japan, rose considerably in 1970, while its imports fell. By the beginning of 1971 the western European and Japanese pulp and paper markets were seriously overstocked at a time of stagnant and even falling demand. As the year progressed, however, slight signs of a recovery in North America appeared and the overseas selling pressure was relaxed, and exports fell back accordingly to about the 1969 level.

As for mechanical pulp, it is probable that some fundamental but gradual changes may be occurring in the international chemical pulp market as producers in the main exporting countries move toward vertical integration with paper and paperboard manufacturing and so reduce availabilities. This trend can be seen most clearly in the mass production grades of paper and paperboard. Parallel with this development there are efforts to restructure the industry in the large pulp-importing countries (for example, France and the United Kingdom) toward fewer and larger industries producing the more specialized grades and utilizing, where possible, domestically available raw materials such as waste paper.

With regard to the international market for paper and paperboard, the year 1971 was characterized by a marked slowing down in demand in western Europe, which resulted in little or no growth in production in the region. At the same time, the long-awaited recovery in North America did begin to materialize in the latter part of the year, but only rather slowly and hesitantly. In Japan, growth in consumption was slow. Consequently, world production, trade and consumption of paper and paperboard expanded in 1971 for the second year running at a rate below the long-term average. According to preliminary estimates, world production of paper and paperboard reached about 127 million tons in 1971 or 3 to 3.5 percent more than in 1970.

It appears that newsprint output last year was barely ahead of the 1970 level, there being little change in North America and lower production in western Europe, offset by increases elsewhere, including Japan and the U.S.S.R. Modest increases were recorded in most regions, with the possible exception of western Europe, in the production of printing and writing paper and other paper and paperboard.

Trade in newsprint was marginally lower in 1971 than in 1970; a slight recovery in Canadian exports to the United States, which account for the major part of the world total, was rather more than offset by lower Canadian and other exporters' shipments to other markets. Exports of other paper and paperboard from North America and western Europe, which accounted for about 88 percent of world exports in 1970, rose slowly in 1971.

Forest policies

Current public concern with the environment and the related problems of resource destruction and pollution have already had an impact on forestry institutions. The management of forest and wild land resources is being integrated for environmental benefits as well as for wood production.

In Europe, concern with recreation and tourism and the protective services of the forest has grown, resulting in legislative and institutional changes. As reported last year, the United Kingdom and France have created ministries concerned with the collective environment, with the French ministry incorporating the forestry administration. This movement has continued. Norway established in 1972 a Ministry of Environmental Affairs, and Spain incorporated its forestry and wildlife administration in broader natural resource agencies.

In the United States, multiple forest land use has long been an established policy of the Forest Service. In recent years, however, the increasing preoccupation with the environment has had a negative effect on attempts to expand wood production. In Canada, a Department of the Environment was established in 1971 incorporating a number of the Federal Government's natural resource activities.

The value of forests, wildlife reserves and national parks for recreation and tourism, and the importance of their conservation, are equally recognized in developing countries. There has been growing concern, especially in Latin America, over the uncontrolled expansion of the cultivated area with the accompanying destruction of forests, often in land unsuitable for agriculture. Evaluation of the damage caused by torrential floods has pointed to the need for conservation in degraded watersheds. Argentina, Colombia, El Salvador, Jamaica, Venezuela and other countries in this region have begun forest conservation works. Pilot projects for watershed management are being continued or started in many Far East countries, including Indonesia, the Republic of Korea, Nepal, Pakistan, the Philippines and Thailand.

In many developing countries, new legislation and institutions have been directed at the more effective

protection and management of forest resources to meet changing social and economic requirements. In Latin America there is a trend to consolidate forestry services, and to integrate, at least at the planning stage, raw material production, industry and marketing. In Brazil, fiscal incentives favour a massive plantation programme, which will be zoned in relation to planned industrial installations. Surinam has taken measures to strengthen its forestry institutions for accelerated development. Mexico has reorganized the Undersecretariat of Forestry and Wildlife and initiated studies for the elaboration of a national plan for forestry development, with forest policy aimed at creating employment in rural zones.

Many countries in the Far East are supporting a regional training centre for wildlife management, and game preservation and the creation of national parks are receiving attention, notably in India. In the Philippines, legislation will merge the three separate government agencies for forestry. In Malaysia, federal and state legislations have been amended to facilitate the balanced development of forestry and forest industry, and a national forestry council established to integrate forestry policy. The Republic of Korea is preparing a 40-year forest development plan aimed at self-sufficiency in wood supplies and protective afforestation of the main river basins. Indonesia has a 20-year forestry plan for the development of the sector. Thailand is completing a study on timber trends and prospects.

Also in Africa measures were being taken to revise legislation for more effective forestry management, especially of the permanent forest estate. Particular attention has been paid to forest policy and legislation covering long-term leases for production from public lands.

AFFORESTATION

Progress has been made with inventories of selected areas, technological studies on tropical and subtropical species of limited commercial acceptance, and on pest and fire control. Impressive progress has been made in plantation establishment. Australia and New Zealand have continued with their target plantings of conifers. Indonesia, the Republic of Korea and Malaysia carried out large-scale experimental plantings with quick-growing species. Work on silvicultural and forest management of the natural forest was undertaken in Western Samoa and general forestry development of the natural forest in Fiji, as well as an expanding plantation programme.

Plans to increase long-fibre reserves in the Latin American region continue with the establishment of coniferous forests at an increasing rate, especially in Argentina, Brazil, Chile and Cuba. First studies on natural forests of Podocarpus in northern Peru and southern Ecuador indicate that these contain a considerable volume of wood per hectare and could be a valuable source of coniferous raw material for the region.

In Africa, also, the spate of plantation establishment continued. From the Horn of Africa through Ethiopia, Kenya, Uganda, Tanzania, Zambia and Malawi afforestation work continued with fast-growing exotics, mainly pines and eucalypts.

Indigenous species were used for new plantations and the reforestation of worked-over rain forest in Gabon, Ghana, Nigeria and other countries where research has proved native species suitable for artificial regeneration. In the Maghreb countries much of the afforestation was part of countrywide soil conservation and erosion control projects.

Development assistance

The third session of the United Nations Conference on Trade and Development (UNCTAD III) offered governments of developed and developing countries the chance to demonstrate their determination to carry out the commitments accepted in the International Strategy for the Second Development Decade, adopted by the United Nations General Assembly in 1970 and described in detail in *The state of food and agriculture 1971*. The meeting concluded with few new steps agreed for development assistance, although aid was a major point of discussion. Targets for the flow of financial resources from developed countries were reiterated and a few donor countries gave new assurances of achieving these within a specified period. The meeting urged developed countries to reach international agreement to implement the untying of aid, and recommended efforts to increase the proportion of resources transferred to developing countries through multilateral institutions and to expand progressively the funds available to the International Development Association (IDA).

Among the proposals which attracted considerable interest were those relating to assistance for the least developed countries, the approach to international monetary reform, and World Bank support for commodity stabilization measures. One resolution set out the measures to be adopted for the 25 countries in the least developed group, including a recommendation that the establishment of a special fund to finance these measures be studied by the Economic

and Social Council. The meeting also urged that assistance flows be insulated from internal and international economic fluctuations. In the wake of the recent monetary crisis, the need for monetary reform and the widest cooperation among developed and developing countries was recognized. The advisability of a link between development assistance and new issues of special drawing rights was accepted and the meeting requested the International Monetary Fund (IMF) to continue its study of the proposals which have been made. Regarding the problems of access to markets and stabilization of returns from agricultural commodities for which complementary action must be taken to assist development, a proposal was adopted for intergovernment consultations on commodities "with the aim of reaching concrete and significant results on trade liberalization and pricing policies early in the 1970s." The meeting also requested UNCTAD to assist developing countries in their participation in the 1973 negotiations of the General Agreement on Tariffs and Trade (GATT). In connexion with commodity stabilization measures, the meeting adopted by a majority vote a resolution requesting the Bank group to make price stabilization an objective of its loan policies, and to work out in cooperation with IMF measures to support diversification, commodity arrangements and buffer stocks; implementation would require amendment of the Bank's Articles of Agreement.

The achievements and failures of development assistance are being increasingly reviewed, partly because of concern in developed countries over the use of resources made available through official programmes. Foreign aid, although very small in relation to overall national budgets, is easily singled out for criticism when the need is felt for increased expenditure on economic and social programmes within the donor countries themselves. The year 1971 was particularly critical for foreign assistance programmes and raised doubts over future levels of aid, chiefly as a result of developments in the main donor country, the United States, where international financial problems and world political developments stimulated domestic opposition to aid legislation. Presidential proposals for changing the United States foreign aid programme, following the recommendations of the Pearson report, were important in clarifying the issues and merits on which aid is to be considered. Although consideration of these proposals by Congress was delayed, measures were taken to separate humanitarian and economic development assistance from international security assistance (although the latter includes an important element of economic support) at both the policy formulation and administration levels. There is also concern in many developing countries about the form and achievements of economic aid and the need for complementary action to liberalize trade and stabilize returns from agricultural exports. This attitude stems from continued dependence on foreign assistance of uncertain levels and nature.

The growth in the volume of aid is usually considered within the framework of the United Nations International Strategy for the Second Development Decade. Against the target of 1 percent of GNP, the net flow from the 16 member countries of the OECD Development Assistance Committee (DAC) has fallen as a proportion of GNP from 0.95 percent in 1961 to 0.82 percent in 1971 (the latter year also includes data on grants by private voluntary agencies which were not available for earlier periods). Preliminary data for 1971 (Table 1-20) indicate an expan-

TABLE 1-20. – NET FLOW OF FINANCIAL RESOURCES[1] TO DEVELOPING COUNTRIES, 1967-71

	1967	1968	1969	1970	1971[2]
	..... *Million U.S. dollars*				
Flow from DAC member countries [3]					
OFFICIAL DEVELOPMENT ASSISTANCE[4]					
Bilateral grants	3 578	3 344	3 250	3 355	3 680
Bilateral development loans at concessional terms	2 233	2 289	2 312	2 394	2 740
Contributions to multilateral institutions	736	683	1 047	1 124	1 260
TOTAL ABOVE	6 547	6 316	6 610	6 873	7 680
OTHER OFFICIAL FLOWS					
Bilateral	493	742	597	871	1 020
Multilateral	20	— 10	— 15	273	270
TOTAL ABOVE	513	732	582	1 144	1 290
TOTAL OFFICIAL FLOWS	7 060	7 047	7 192	8 017	8 970
PRIVATE FLOWS					
Direct investment	2 105	3 043	2 910	3 554	4 080
Bilateral portfolio	800	971	1 211	777	790
Multilateral portfolio	469	767	419	474	680
Export credits	1 007	1 596	2 047	2 175	2 690
TOTAL ABOVE	4 381	6 377	6 587	6 980	8 240
TOTAL OFFICIAL AND PRIVATE	11 441	13 425	13 779	[5]15 851	[5]18 100
Estimated flow from non-DAC countries [6]	240	262	252	...	...
GRAND TOTAL	11 681	13 689	14 031	...	...

SOURCE: Organisation for Economic Co-operation and Development.

[1] For DAC member countries, data refer to gross disbursements minus amortization receipts on earlier lending. – [2] Preliminary. – [3] Australia, Austria, Belgium, Canada, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom, United States. – [4] Flows which are intended primarily to promote the economic development and welfare of developing countries, and which are intended to be concessional in character. – [5] Including grants by private voluntary agencies. – [6] Finland, New Zealand, and the centrally planned countries.

sion of 14 percent in the total flow of resources over the previous year to U.S.$18 100 million. However, in real terms the increase is substantially lower, in view of the inflation which was particularly marked in 1971 in most developed countries where the bulk of development assistance funds are spent. Most of the increase was accounted for by private financial resources, which amounted to over $8 000 million. More than half of this amount represents direct investment in developing countries, while another 30 percent are export credits extended on relatively short-term bases and at relatively high charges.

Although the effectiveness of official assistance from developed countries must be considered in the light of the policies and the mobilization of resources of the developing countries themselves, the volume is an important feature of development assistance. Official development assistance has declined from 0.52 percent of GNP in 1961 to 0.35 percent in 1971, compared with the target of 0.70 percent which, however, is yet to be accepted by all countries. In 1971, the flow of official financial resources of DAC members increased by about 12 percent to some $7 680 million. The largest absolute increases, of more than $100 million, were from France, the Federal Republic of Germany, the United Kingdom and the United States, although faster rates of increase were recorded for some of the smaller donors. The volume from the United States, by far the largest donor, increased by almost 10 percent and accounted for about 43 percent of total official assistance compared with almost 60 percent at the beginning of the 1960s. The expansion of assistance programmes in other developed countries has suggested the need for a broad system of international responsibility in coordinating aid, and a number of countries are allocating increasing shares of their programmes to multilateral agencies.

The terms on which official assistance is granted are a matter for concern because mounting debt-servicing charges, particularly for export credits, may create difficulties as a result of even a small reduction in export earnings. In 1971, bilateral grants again declined slightly as a proportion of total official assistance. While progress has been made in softening loan terms, recent research [37] by the World Bank indicates that the flow of resources in those categories with a relatively high concessionary element has grown only very slowly or not at all in the past few years, while growth in most of the " hard-term " categories has been rapid. Substantial advances have been made by DAC in untying bilateral development loans but international monetary difficulties hindered the conclusion of an agreement for implementation in 1971.

[37] International Bank for Reconstruction and Development (IBRD), *Annual report, 1971*, p. 48, Washington, D.C.

The proportion of development assistance going into agriculture is difficult to ascertain, not only because of the wide range and diversity of programmes, but also because many projects, although not primarily agricultural, bring about improvements also in that sector. Aid may substantially affect the longer term pattern and development of output. For example, production of palm oil on projects financed either wholly or partly by six major international banks and development funds is expected to increase from about 22 000 tons in 1970 to some 550 000 tons in 1980, representing 15 percent of estimated world output and 28 percent of likely growth over the decade.[38] Increasing importance is being given to agriculture as a result of programmes to improve the welfare of rural populations, and developing countries are channelling greater resources to this sector, but increased external aid as well as changes in its composition are necessary to maintain growth. The United States development aid programme is being geared to areas of special concentration, including the improvement of agricultural and food production, and the proportion of technical assistance extended to agriculture is likely to increase beyond the estimated 20 percent in 1971 [39] while development loan programmes will continue to include a large number of agricultural projects.

The World Bank Group and the financing of agriculture

The operations of the World Bank and its soft loan affiliate, the International Development Association (IDA), continued to grow during 1971/72, the fourth year of the five-year plan launched by the Bank's president Robert S. McNamara. Total Bank loans and IDA credits approved in 1971/72 increased by nearly 20 percent to U.S.$2 965 million, thus exceeding the target of lending for the plan period. Much of this growth is accounted for by the large rise in the approval of IDA credits, which increased from $584 million in 1970/71 to $1 000 million, while Bank loans registered a relatively small increase from $1 896 million to $1 966 million.

IDA replenishment must be one of the major headaches facing the Bank. Nearly one third of the credits approved in 1971/72 could not be signed for lack of available funds. The United States Government agreed to IDA replenishment on the terms negotiated more than a year ago but succeeded in getting the necessary legislation passed by Congress

[38] FAO, Committee on Commodity Problems, Intergovernmental Group on Oilseeds, Oils and Fats, *Prospects for supplies of palm oil and palm kernels to 1980*, Rome, November 1970. CCP: OF 72/2.

[39] Secretariat estimate based on preliminary data included in AID's Programme Presentation to the Congress, outlining the President's foreign aid request for the fiscal year 1972.

only in September. Although other donors had made advance contributions, the failure of the United States, the major contributor, to ratify the replenishment left IDA without any contribution from this country during the year and posed uncertainty for IDA reactivation and consequently for prospects of soft-term aid to poorer developing countries. Since more IDA credits than IBRD loans go to agriculture this uncertainty also extends to external aid for agricultural development.

Agriculture remains the priority sector for lending by the World Bank Group. During 1971/72 IBRD loans and IDA credits approved for projects handled by the Agriculture Projects Department of the Bank amounted to $435.9 million (for 36 projects) compared with $419.2 million (35 projects) in 1970/71. IDA credits accounted for 72 percent of the total amount in 1971/72, against 57 percent in 1970/71. As mentioned in *The state of food and agriculture 1971*, these statistics provide a rather incomplete picture of the Bank's operations in the field of agriculture; they do not include loans or credits approved for agriculture components in projects handled by the Bank's departments for projects in education, industries, transportation and special projects. For example, in 1971/72, agricultural education accounted for total loans or credits of about $37.2 million among education projects. Nevertheless, the figures given in Table 1-21 indicate a slower growth rate of loans and credits for agriculture over the last three years than of total lending by the Bank. It now appears unlikely that the target of a fourfold increase in loans to agriculture during the period 1969-73 will be achieved. There are many reasons for the shortfall, one of which is the shortage of funds in IDA as mentioned earlier; another relates to deferment in project processing on various grounds. The indications are that if the rate of agricultural lending is to be substantially stepped up next year and in the ensuing five-year plan, there will have to be a considerable increase in efforts on the part of the Bank and, through its Cooperative Programme, FAO, in the identification, preparation and appraisal of projects. From the classification of projects by type (Table 1-21), it appears that over the last three years a large share of approved amounts has been going to irrigation, livestock and agricultural credit projects, while forestry and fisheries continue to account for the smallest proportions. The general agriculture group is heterogeneous and includes a few projects in new fields such as research, marketing, and agro-industries. The 27 countries with projects approved in 1971/72 included 14 in Africa, 5 in south and east Asia and the Pacific, 3 in Europe, the Near East and north Africa, and 5 in Latin America. The priority on lending to African countries is indicated in this distribution.

TABLE 1-21. – IBRD LOANS[1] AND IDA CREDITS FOR AGRICULTURE BY PROJECT TYPE, 1969/70-1971/72

	1969/70		1970/71		1971/72	
	Million U.S. dollars	*Percent of total*	*Million U.S. dollars*	*Percent of total*	*Million U.S. dollars*	*Percent of total*
Irrigation	207.7	50.3	49.5	11.8	148.4	34.0
Agricultural credit	74.6	18.1	108.1	25.8	145.5	33.4
Livestock	55.1	13.4	118.5	28.2	58.1	13.3
Tropical crops	33.0	8.0	34.4	8.2	32.4	7.4
Fisheries	1.3	0.3	3.5	0.8	5.4	1.3
Forestry	11.1	2.7	—	—	—	—
Other general agricultural development, including marketing	30.1	7.2	105.2	25.1	46.1	10.6
TOTAL	412.9	100.0	419.2	100.0	435.9	100.0

[1] Data relating to loans and credits approved in each fiscal year to projects handled by the Agriculture Projects Department of IBRD.

The Bank has been showing more concern with the social and economic issues of development. The president has emphasized on a number of occasions the grave problems posed by population explosion, malnutrition, income disparity and unemployment. While the Bank has already entered the field of family planning and has undertaken lending operations in addition to studies, it has still to formulate its role in tackling other problems. In agriculture emphasis is being placed on integrated development and nutrition. In some areas FAO has had long experience and is cooperating with the Bank in common future tasks.

A major new initiative is the International Agricultural Research programme sponsored by FAO, UNDP and IBRD (see Chapter 4).

Regional development banks

The operations of the regional development banks continued to expand in 1971 and it became necessary for the Asian Development Bank (ASDB) and the Inter-American Development Bank (IDB) to take measures to increase their capital, while for the African Development Bank (AFDB) the need to mobilize resources, which fell far short of authorized capital, became acute. The Board of Governors of the ASDB decided to augment the authorized capital by 150 percent from U.S.$1 100 million to $2 750 million. It is believed that this will permit lending operations to grow by more than 10 percent per year over the next four years without damage to the Bank's liquidity position or over-

dependence on borrowing. The ordinary capital of the IDB was increased from U.S.$3 566 million to $5 150 million. These increases in capital also provide the two banks with substantial new guarantee authority to borrow funds in the world's capital markets in coming years.

The IDB proposal to increase its Fund for Special Operations by $1 500 million to $3 800 million was delayed as requirements to put it into effect were not completed during the year. The increase in the Fund's resources was now scheduled to come into effect on 30 June 1972. The ASDB projections of annual soft loan operations through its Special Funds indicate an increase to $300 million by 1975 — half its projected loan operations — compared with $51 million in 1971, and the Bank is currently studying how contributions to this Fund, which have until now been voluntary, could be placed on a more firm and predictable basis.

In 1971, IDB authorized 59 loans amounting to a new record total of $652 million. About 36 percent of the Bank's lending in 1971 was extended from its ordinary capital resources, 61 percent through the Fund for Special Operations, and 3 percent from the resources the Bank administers for Argentina, Canada and the United Kingdom. On a cumulative basis (1961-71) 37 percent of loans ($1 760 million) have been provided from its ordinary capital resources, 51 percent ($2 410 million) from its Fund for Special Operations, and 12 percent ($576 million) from various other funds and resources. Authorizations now total $4 740 million. Sectorwise, in 1971, infrastructure projects (transportation, communications and electric power) accounted for $320 million (49 percent) of loan authorizations, and agriculture for $93 million (14 percent). On a cumulative basis, however, agriculture, with total loan authorizations of $1 162 million (24 percent), has been the Bank's main borrowing sector.

One of the most important innovations relates to the Bank's decision to amend its establishment agreement so that Canada, which is not a member of the Organization of American States, might join, and providing also for the admission of other non-regional developed countries. The initial capital contribution by Canada has been set at U.S.$300 million. Another major policy decision, applicable particularly to developing member countries, concerned terms for soft loans covering economic and social projects: interest rates have been set at 2 percent with a grace period of up to 10 years and amortization extending to 40 years, in contrast to 3 to 4 percent interest, shorter grace (5 years) and amortization periods (25 years) for developed member countries.

Total project approvals by the ASDB amounted in 1971 to U.S.$254 million ($245 million in 1970), the cumulative total of loan approvals since January 1968 being $638 million. Of the 28 loans approved, 12 loans amounting to $51.5 million (20 percent) were extended through the Special Funds, as compared to 14 percent in the previous year. The sectoral distribution of loans in 1971 was: transport, communications and power 59 percent, industry 18 percent, water supply 12 percent, agriculture 11 percent. A cumulative distribution of approved loans shows that infrastructure received 45 percent, industry 32 percent, agriculture 14 percent, water supply and other 9 percent. Some concern has been expressed at the low volume of loans to agriculture over the last two years.

By the end of June 1972, the African Development Bank (AFDB) had approved 36 projects involving a total commitment of 62.6 million units of account (1 unit of account = 1 predevaluation U.S. dollar) while the total amount disbursed amounted to 18 million. So far, eight agricultural projects in seven member countries, involving commitments of 11 million units of account, have been approved. Six of these projects were prepared with the assistance of FAO.

However, the precarious financial situation of the Bank made imperative the mobilizing of further resources to permit operations after 1973. By the end of June the Bank's paid-in capital amounted to 86 million units of account out of 250 million authorized share capital. Efforts of the Bank to expand its resources concentrated on various possibilities, including the recovery of arrears and the accession of new African member countries. Gabon and the Libyan Arab Republic joined the Bank and subscribed 33 million units of account, but no agreement was reached on the opening of membership to non-African countries, a subject discussed at length at the eighth annual meeting of the Board of Governors in Algeria in July 1972. However, the Bank approved the establishment of the African Development Fund which will be a legal entity separate from AFDB. Its purpose will be to assist the Bank in providing finance on concessional terms to African countries, and its resources are expected to be more than 100 million units of account. The participants include the AFDB and the following countries: Belgium, Brazil, Canada, Denmark, Finland, the Federal Republic of Germany, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, the United States and Yugoslavia. These countries have pledged 98 million units of account.

The World Food Programme

The contribution of the World Food Programme (WFP) to development in the form of food aid is additional to the financial and technical aid provided by other organizations, particularly the United Na-

tions Development Programme (UNDP) and the specialized agencies of the United Nations. In the context of unemployment and underemployment, especially in the agricultural sector, the labour-intensive projects of WFP contribute to development programmes while fighting malnutrition.

The importance of food aid in mobilizing volunteers for community development is shown by the fact that, by June 1971, 833 500 workers who received no payment other than WFP rations had put in a total of 14.2 million man-days of work since the Programme was established in 1963. By September 1971 WFP was helping to feed 11.1 million people in 63 countries, under projects approved for economic and social development.

Agricultural and trade policies in the major donor countries have a determining influence on the size and composition of their pledges. In 1969 the Programme received large quantities of dairy products and was able to launch ambitious projects for school meals and the development of dairy industries. By 1971 these supplies had all been committed. The Programme's food basket was thus extremely short of high-protein foods, and could offer only cereals and cereal-milk-soybean blends and vegetable oil to new projects. A shortage of rice has prevented an expansion of WFP's work in Asia and the Far East, where wheat and wheat flour are not so acceptable to the people.

This uncertainty of supplies handicaps the planning of Programme activities, as this must be based on knowing what commodities will be available for at least two or three years ahead.

The rules of the Programme for emergency aid limit the amount which can be given in any one year to $10 million, although this may be increased by WFP's 24-nation Intergovernmental Committee — the Programme's governing body. In the last three years the $10 million have, in fact, proved inadequate and $18 to $20 million have been allocated. The sheer magnitude of the disasters which occurred in 1970 and 1971 — the earthquake in northern Peru, the tidal wave and cyclone in the former East Pakistan and later the mass exodus of people into India — made heavy demands on international relief. In India and Pakistan, stocks available in the areas affected were borrowed or transferred to provide immediate relief and WFP, working through the focal point established by the office of the United Nations High Commissioner for Refugees in Geneva, made available $3.1 million worth of food to displaced people in India. WFP also acted as an agent in purchasing, transporting and supervising food assistance valued at $52.4 million on behalf of bilateral donors. Emergency assistance to Bangladesh amounted to $1.5 million and three quasi-emergency projects for a total of $2.8 million to encourage rehabilitation work were approved. WFP also acted as agent for bilateral donations of rice and wheat.

The Programme frequently does not have ready food stocks at its disposal. This makes it difficult to respond to appeals for emergency relief. In an emergency every effort is made to " borrow " nearby stocks and transport them swiftly to the stricken area. However, if supplies have to be requested from government pledges, and shipping arranged from ports half way across the world, the time lag is considerable and WFP emergency operations are usually more in the nature of help for rehabilitation. It was recently proposed that stocks of emergency food be stored in existing strategic centres around the world, ready for immediate dispatch to disaster areas. This proposal and the recent appointment of a United Nations Coordinator for Disaster Relief are expected to bring about changes in WFP's capacity to respond adequately to emergency calls.

WFP is able to send food aid in good time in the case of one type of disaster which is slow to develop — crop failure due to drought or pests. FAO's Early Warning System, which receives monthly reports on crop conditions from drought-prone countries, has made it possible to forecast food shortages in time for advance shipments of WFP supplies to be made.

Chapter 2. - REVIEW BY REGIONS

Western Europe

Growth in the volume of production slowed down in 1971 for the second consecutive year in the industrial countries of the region. At about 3 percent, the growth rate was much lower than during the last decade when it averaged 4.5 percent. Decline in activity was quite general notwithstanding pronounced differences from one country to another.

The main factor was probably the small rise, or even fall, in the demand for capital goods, weakened by restrictive monetary policies. Stocks or inventories likewise increased little or even diminished. Finally, the increase in exports of goods and services slowed down. In most countries the main stimulant to the economy came from private consumption and the strong inflationary pressures of 1970 continued. Employment, naturally influenced by this slowdown, decreased in many countries. Slow growth in western Europe's production and demand entailed a slowdown of trade, especially of imports. Moreover, the region's trade suffered from the monetary crisis like trade in the rest of the world. Nevertheless, because of a moderate expansion in production, the current payment surplus increased noticeably.

The situation was quite different in the southern European countries, since practically all experienced an expansion at least equal to that of 1970 and well above the average of the 1960s. Although internal demand increased more slowly than production, prices generally rose considerably.

Agricultural production

Climatic conditions were favourable or at least satisfactory in most parts of the region in 1971. They undoubtedly favoured grain crops, although long periods of drought sometimes harmed such row-crops as maize and sugar beet, and also forage crops.

Agricultural production was up 5 percent, a rate much higher than that of recent years (Table 2-1). The level of production was higher in all countries except Italy (index unchanged due to lower output of maize, apples, pears and wine) and Portugal (down by 3 percent with less production of maize, potatoes, wine, rice and olive oil). The increase was particularly noticeable in Yugoslavia (where production after the drop in 1970 regained the high level of 1969), in Belgium, and in Switzerland and Spain.

Regional grain production rose by 16 percent to a record 148 million tons. The increase in wheat production was 19 percent; the largest gain took place in the European Economic Community (EEC) where yields per hectare went from 30.4 quintals in 1970 to 33.6 quintals in 1971, and in the southern European countries.

Barley reached a new record of 14 percent above the average of the previous five years, following the poor harvest of 1970. The change was especially marked in the southern countries where prices favoured grains other than wheat. Maize followed its upward trend with an increase of 7 percent; 18 percent in France and 3.5 percent in Yugoslavia, but output was down slightly in Italy. For rye, the steady downward trend of the last decade was interrupted by an increase of 12 percent. Rice output increased in Italy but was lower in France, Spain and Portugal.

Sugar beet increased by 6 percent following the drop of 2 percent in 1970. There were very good harvests in France, the United Kingdom and the Netherlands. In contrast, drought caused a reduction in Austria (also influenced by a fall in area) and Greece. In a number of countries the area planted to potatoes continued to decline as well as output, in spite of yields which were often good.

Production of apples declined by 15 percent in EEC, but this decrease cannot be attributed to measures taken to encourage eradication of fruit trees. In the Netherlands and the Federal Republic of Germany, where such action was relatively important, harvests increased by 7 and 11 percent respectively, while in Italy where similar measures have not yet been applied output fell by 17 percent. Apple production also rose in Yugoslavia and Spain. Pear production fell in all countries of the Community (15 percent) except France. The reduction was par-

TABLE 2-1. – WESTERN EUROPE: INDICES OF FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971
	1961-65 average = 100					*Percent*	*1961-65 average = 100*					*Percent*
Food production												
EEC	113	116	115	119	123	+ 3	109	111	109	112	115	+ 3
Belgium-Luxembourg	111	115	118	126	138	+ 10	108	111	114	121	133	+ 10
France	113	118	114	121	125	+ 3	109	113	108	114	116	+ 2
Germany, Fed. Rep. of	113	118	116	118	123	+ 5	109	113	110	110	115	+ 5
Italy	113	110	116	114	115	—	110	106	110	108	107	—
Netherlands	110	113	114	127	132	+ 4	105	106	106	117	120	+ 2
OTHER WESTERN EUROPE	111	112	114	114	122	+ 7	107	108	109	108	115	+ 6
Austria	109	110	114	108	113	+ 4	107	108	111	105	109	+ 4
Denmark	103	106	99	96	101	+ 6	99	102	95	91	95	+ 5
Finland	104	105	111	111	115	+ 4	102	101	107	107	112	+ 4
Greece	121	120	127	137	138	+ 1	118	116	122	130	131	+ 1
Iceland	107	101	101	100	107	+ 7	100	93	92	90	96	+ 6
Ireland	115	113	114	114	120	+ 6	113	111	111	110	115	+ 5
Malta	124	138	153	150	156	+ 4	127	141	154	150	155	+ 3
Norway	100	109	103	106	107	+ 1	97	105	98	100	101	—
Portugal	108	108	104	110	107	— 3	104	103	98	103	99	— 4
Spain	108	118	121	122	131	+ 8	104	113	114	114	121	+ 7
Sweden	106	110	95	103	107	+ 4	102	106	90	98	101	+ 3
Switzerland	115	112	113	110	119	+ 8	109	105	105	101	108	+ 7
United Kingdom	110	108	109	115	121	+ 6	107	104	105	111	117	+ 5
Yugoslavia	125	122	137	118	141	+ 19	120	116	128	110	130	+ 18
REGIONAL	112	114	115	117	123	+ 5	108	110	109	111	115	+ 4
Agricultural production												
EEC	113	116	115	119	123	+ 3	109	111	109	112	115	+ 3
Belgium-Luxembourg	110	113	116	123	136	+ 10	106	109	112	119	130	+ 10
France	113	118	114	121	125	+ 3	109	113	108	113	116	+ 2
Germany, Fed. Rep. of	113	118	116	117	123	+ 5	109	113	110	110	115	+ 5
Italy	113	110	116	114	115	—	110	106	110	108	107	—
Netherlands	109	112	113	126	131	+ 4	104	105	105	116	119	+ 3
OTHER WESTERN EUROPE	100	112	113	114	121	+ 6	107	107	108	108	114	+ 6
Austria	109	110	114	108	113	+ 4	107	108	111	105	109	+ 4
Denmark	102	106	99	95	101	+ 6	99	102	95	91	95	+ 5
Finland	104	105	111	111	115	+ 4	102	101	107	107	112	+ 4
Greece	118	116	121	130	132	+ 1	115	111	116	124	125	+ 1
Iceland	108	101	101	100	106	+ 7	100	93	92	91	96	+ 6
Ireland	115	113	113	113	120	+ 6	113	111	110	109	115	+ 5
Malta	124	138	153	150	156	+ 4	127	141	154	150	155	+ 3
Norway	100	109	103	106	107	+ 1	97	105	98	100	101	—
Portugal	108	108	104	110	107	— 3	104	103	98	103	100	— 4
Spain	107	117	119	120	129	+ 7	103	111	112	112	119	+ 6
Sweden	105	110	94	103	107	+ 4	102	105	90	98	101	+ 3
Switzerland	115	112	113	110	119	+ 8	109	105	105	101	108	+ 7
United Kingdom	110	107	108	114	121	+ 6	107	104	104	110	116	+ 5
Yugoslavia	125	121	135	117	138	+ 18	119	114	126	109	127	+ 17
REGIONAL	112	114	114	117	122	+ 5	108	109	108	110	114	+ 4

[1] Preliminary.

ticularly marked in the Netherlands and in the Federal Republic of Germany. Despite this drop the market was declared in a state of crisis in September 1971 and in March 1972. Output of peaches grew by 20 percent in France and 11 percent in Italy. Production of table grapes decreased by 21 percent in Spain, 18 percent in France and 6 percent in Italy. Wine production, after an excellent year in 1970, declined significantly in most of the main producing countries.

In most countries of the region the number of milk cows continued to drop. In the Community measures taken since 1969 to reduce milk and to increase beef production have continued to make their influence felt and the number of milk cows declined by 2.7 percent in 1971. Despite this reduction deliveries to milk plants in the Community increased slightly. In the United Kingdom, Ireland and Switzerland there was also an increase in deliveries, while decreases occurred in Denmark, Finland and Austria. Butter production declined again by 3 percent in the Community; at midyear falling supplies resulted in higher prices and permitted the removal of export subsidies. By the end of 1971 production had increased in most countries and stocks were also rising. Production increased in Ireland, Norway and the United Kingdom while diminishing in Austria, Denmark, Finland and Switzerland, resulting in a decline of 3 percent in the northwest of the region. In contrast, cheese production in the Community, stimulated by increased demand, continued to grow at 3 percent (in the Netherlands by 16 percent). All the countries in the northwest raised their output (average 6 percent) but at varying rates: the largest increases occurred in the United Kingdom, 20 percent; Ireland, 19 percent; Sweden, 9 percent; Denmark and Finland, 8 percent. Community production of dried skim milk, as for butter, continued to decline and fell by 3 percent. By the end of 1971 stocks amounted to 80 000 tons, against 180 000 in 1970 and 390 000 in 1969. In order to assure adequate supplies for the domestic market, export subsidies were abolished in October 1971 and a tax of 10 units of account per quintal was applied on exports, later increased to 20 units of account. These measures illustrate very clearly the complete change which occurred in the milk market of the Community in 1971, but already in the first months of 1972 a new situation was emerging. In the other countries of the northwest production increased considerably. With strong demand and rising prices, output of powdered whole milk in the region grew markedly (in EEC countries by 12 percent). This expansion was particularly noticeable in the Netherlands, while other members recovered from the low levels of 1970.

Regional production of beef increased only slightly (1 percent): in the Community there was no increase compared with 3 percent in 1970, while in other countries there was a gain of 2 percent against a 4 percent increase in 1970. This slow growth is largely explained by the reduction in cow herds, encouraged by EEC policy. In southern countries the increase was maintained at 4 percent, but in Spain and Portugal production capacity was reduced by increased slaughter caused by droughts in 1970. In the region as a whole, limitation of beef supplies and imports has entailed higher prices, which have increased the demand for pork and chicken. Pigmeat production increased by 8 percent. Output went up from 6 percent (1970) to 8 percent in the Community and in the other countries of the northwest by 7 percent against 3 percent (1970). However, the rise of 8 percent in the southern countries was considerably below the 14 percent of the previous year. Generally, abundance of supplies and lower prices encouraged a high level of consumption. There was little change in mutton production: a slight increase in the Community where there are now signs of a definite expansion, no change in the northwest countries of the region and declines in the southern countries. Finally, the increase in the production of poultry meat slackened in most countries. The large output of 1970 depressed prices and had a discouraging effect on output in 1971.

Trade in agricultural products

Trade in 1971 was affected by the major economic and monetary developments of the year. The appreciation of most currencies, in particular those of EEC countries, affected the growth of exports, while prospects for imports, particularly of raw materials, were limited in most countries as a result of the economic slowdown and continued pressure on production costs. Total agricultural exports increased by about 4 percent but the value grew by 14 percent, mainly reflecting higher prices of food and feedstuffs which account for the bulk of agricultural export earnings (Table 2-2). Earnings from tobacco and beverages, particularly wine, also increased, but these items account for only about 10 percent of earnings, and raw materials, which represent a very small share of the total, declined.

Among food products, meat exports expanded by about 10 percent and accounted for one fourth of agricultural earnings. This expansion was considerably above the rate of increase in world trade of only 4 percent and in sharp contrast with the 22 percent fall in meat exports from developing countries. Imports of meat increased also, but only by 2 percent, and consequently the region's net imports were lower.

TABLE 2-2. – WESTERN EUROPE: INDICES OF VALUE OF EXPORTS OF AGRICULTURAL PRODUCTS

	Share of total in 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	Percent	..... *1957-59 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	182	191	222	253	289	+ 14
Food and feedstuffs	88	188	199	233	272	304	+ 12
Cereals	15	277	316	390	393	419	+ 6
Fruit	7	164	156	177	191	206	+ 8
Meat	25	249	262	296	346	388	+ 12
Dairy products	21	161	169	183	213	278	+ 31
Beverages and tobacco	10	180	179	195	231	271	+ 17
Tobacco	2	151	121	121	130	128	— 1
Wine	8	198	213	239	291	356	+ 22
Raw materials	2	102	106	103	99	90	— 9

[1] Preliminary.

Most of the export growth was in pigmeat, for which western Europe is a net exporter; shipments increased by 37 percent owing principally to expansion in Belgium, Denmark and the Netherlands. However, the value of exports increased by 19 percent, because of lower prices as a result of abundant supplies in practically all major producing and consuming countries, with the exception of the United Kingdom and Ireland. Trade among EEC countries increased again, France, the Federal Republic of Germany, and Italy being the main importers. Exports of beef and veal, for which the region is a net importer, increased in 1971. The general shortage in relation to world demand caused further price increases during the year and the value of shipments, which accounted for about one third of the region's earnings from meat, increased by 20 percent although the volume was only 7 percent greater than in 1970. The largest increase was in exports from France. The value of poultry meat exports increased by 11 percent mainly as a result of increased volume. Exports from Belgium, Denmark, France and the Netherlands expanded, while net imports into the Federal Republic of Germany increased further. Western Europe has been a net exporter of poultry meat since 1970.

The value of dairy products, which account for about one fifth of earnings from agricultural exports, increased by 31 percent as higher prices followed the acute world shortage of major milk products during the year. Western European exports of cheese, the most important commodity in the group, grew by more than 8 percent, exceeding the rate of growth in world trade. Cheese is traded almost exclusively between high-income countries and, among the more important exporters, larger sales were made by the Netherlands, France and Denmark. Although world trade in skim powder fell, exports from western Europe grew slightly while those of whole milk also increased and, with substantially higher prices, earnings were more than 50 percent greater than in 1970. While butter exports were lower, reflecting reduced shipments from EEC, Denmark, Ireland and Finland, the value of the region's exports increased by almost 40 percent, again as a result of the record prices of 1971.

Cereals exports declined but earnings, which account for some 15 percent of the value of agricultural exports, increased by about 6 percent, mainly due to larger maize shipments at higher prices, which more than offset lower earnings from most other cereals. As a result of poor 1970 wheat crops there was a substantial decline in 1971 exports, mostly from the Federal Republic of Germany and Italy, reflected in a considerable increase in the region's net imports. However, after more normal 1971 crops net import requirements declined and prices fell from the levels prevailing during the early part of 1971, when the outbreak of corn blight in the United States also affected wheat prices. Barley exports declined too, but because of earlier high prices the unit values of 1971 exports were above those of the previous year and the value of trade fell by less. Earnings from maize exports were 50 percent greater as a result of higher unit values, but in particular because of a 40 percent expansion in volume. Most of the growth was in shipments from France where exports nearly doubled, with larger sales to EEC as well as third countries.

Among beverage and tobacco commodities which registered a large increase in 1971, wine exports continued to expand and contributed some 8 percent

of the value of agricultural product earnings. Most of the increase was in shipments from Italy which, partly as a result of the EEC common wine policy, were several times greater than the levels prevailing during the 1960s. France and Spain also maintained a high volume of shipments. The region's exports almost equalled imports, which were lower than in 1970, with reductions — particularly in France — that were not offset by increases elsewhere.

Imports of agricultural products into the region grew at a much lower rate than during the past few years, reflecting a general slowdown which was particularly marked for beverages and tobacco and raw materials, the latter actually falling by 6 percent (Table 2-3).

Among foods and feedstuffs, cereal imports grew by more than 4 percent. Imports of oils and oilseeds continued to expand, especially of soybeans, with larger imports into Spain. Exports of soybean oil from western Europe also expanded rapidly and were several times greater than the volume of recent years. Copra imports, particularly into the Netherlands and the Federal Republic of Germany, recovered from the relatively low level of the previous year, while palm oil imports continued to expand, especially in the Federal Republic of Germany, the Netherlands and the United Kingdom. Imports of groundnuts declined further, mainly in France, but the value fell only slightly as a result of higher prices. Imports of all fruit at increased prices were greater except for oranges, which fell in volume from the high level of the previous year. In spite of an expansion in the region's exports, net imports of apples were greater, with larger purchases by the Federal Republic of Germany. The region's net imports of meat (mainly beef and veal) decreased, with smaller imports into Greece and Spain that were not offset by increases in other countries, particularly Italy. Dairy product imports increased slightly as a result of larger imports of milk and — particularly in France and the Federal Republic of Germany — cheese.

A small increase took place in imports of beverages and tobacco. Coffee purchases grew marginally, while cocoa imports expanded as a result of falling world prices. On the other hand, wine imports fell because of smaller consignments to France.

The reduction in raw material imports reflected the failure of the wool textile industry to recover from the 1970 recession, although there were increases in France and the Federal Republic of Germany. Cotton imports were also lower in all the major importing countries as a result of reduced mill activity and high cotton prices, which accelerated substitution by man-made fibres.

Prices and incomes

In general, the agricultural sector suffered in comparison with other sectors of the economy, as farm production costs, affected by inflationary pressures,

TABLE 2-3. – WESTERN EUROPE: INDICES OF VOLUME OF IMPORTS OF AGRICULTURAL PRODUCTS

	Share of total in 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	Percent	..... *1957-59 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	126	128	134	139	141	+ 2
Food and feedstuffs	64	138	140	147	154	160	+ 3
Cereals	15	133	128	131	141	147	+ 4
Fruit	8	144	143	150	150	156	+ 4
Oils and oilseeds	10	138	141	146	162	173	+ 7
Meat	11	154	158	170	170	174	+ 2
Dairy products	6	117	124	127	137	139	+ 1
Beverages and tobacco	20	127	131	135	141	143	+ 2
Coffee	8	159	173	182	186	189	+ 1
Tobacco	5	138	132	141	143	154	+ 8
Raw materials	16	95	99	102	101	95	— 6
Wool	6	87	94	99	99	91	— 7
Cotton	5	94	92	94	88	83	— 6
Rubber	3	117	125	140	141	141	—

[1] Preliminary.

increased more than payments received. Relative price changes can be summarized as follows: increases were higher for livestock products than for crops; in particular, increases were relatively small for cereals and high for milk and meat; for inputs, labour costs increased most (10 to 18 percent), reflecting a growing scarcity of the skilled workers required in modern farming. Public authorities have taken different measures to improve the incomes of farmers whose purchasing power was increasing little, if not diminishing. These have involved the revision of the level, or of the structure of the whole system, of guaranteed prices or increases in selected prices.

In France, farmers' real incomes increased on an average by 4.8 percent, against 3.2 percent in 1970; in Italy, the increase is estimated at 3 percent; on the other hand, in the Federal Republic of Germany, according to the latest Green Report (Grüner Bericht) real income dropped by 10 percent in 1970/71 in sharp contrast to the 14 percent rise in the incomes of industrial workers. However, despite the revaluation of the Deutschmark in December 1971, which entailed a drop of 4.6 percent in Community prices, a significant increase in income is expected in 1971/72. The Government paid DM 1 700 million to farmers in 1971: 780 million as a value added tax reduction to compensate for the revaluation effects of 1969, and 920 million in direct payments.

In the United Kingdom, the increase of net incomes is estimated at 9 percent for 1971/72 in current prices, but continued inflation is likely to have absorbed the greater part of this increase. A rise of £72 million in farm price guarantees and subsidies was made at the annual review in March 1972. The award covers farmers' increased costs (calculated to amount to £48 million on guaranteed commodities) over the previous year and also provides cash for expansion of domestic food production so as to reduce the cost of entry into EEC. Livestock farmers benefit most.

In Ireland, the price of milk received attention in view of EEC adherence: the system of multiple repayments for milk delivered to plants, in force since 1 December 1970, was replaced by a price system applicable to the different dairy products. Guaranteed prices for pigs were increased in May and September 1971.

In Denmark, price increases decided upon in August 1971 will favour butter, meat and eggs (up 4 to 6 percent). Prices of grains were largely unchanged. Farmers' prices in Norway, as of July 1971, were modified along similar lines. Also since 1 July 1971, farmers have the right to paid annual leave: those who receive at least 75 percent of their income from farm sources have the right to 12 days of paid leave and can obtain reimbursement for the cost of a substitute. A system of providing such farmers with substitutes has now been established.

In Sweden, also, price agreements for the three-year period 1 July 1971 to 30 June 1974 favour livestock products, especially milk production which had decreased sharply. Customs duties increased for most products and some supplementary income will be paid to farmers. The net income of an average farm should rise by about 12 percent in 1971/72, largely as a result of these measures.

In Austria, the price of milk was also increased in June 1971 and producers' distribution expenses progressively reduced. In Switzerland, the basic milk price has increased by 7 percent and the annual quantity to which this price applies grew by 25 000 tons to 2 600 000 tons. The supplementary price of milk for cheese production and skim milk has also increased. Finally, the producers' contribution to dairy market losses decreased from 3 to 1.5 francs per 100 kilogrammes.

In Spain, most agricultural subsidies (91.5 percent) went to inputs (fuel and machinery 77 percent, seed grains 15 percent and pesticides 8 percent). The balance went to grain producers.

In Yugoslavia, guaranteed prices were increased in June 1971 to reduce the gap between prices paid and received. The new guaranteed prices are now applicable to the individual farm as well as to cooperative farms. Also under consideration is the possibility of letting market prices exert more influence, with less official intervention. Besides price policies, other measures for market equilibrium were taken in Yugoslavia. Meat was the main commodity involved.

In France, a sheep development programme is expected to increase mutton production by 30 000 tons between 1972 and 1975. Farmers belonging to eligible organizations will receive a premium for each breeding animal kept to increase the herd as well as payments for quality improvement. Producers' groups will also be encouraged. In Ireland, the subsidy for keeping young ewes for breeding has also been increased. Mainly as a result of the 1970 subsidy scheme, the number of farmers who by participating in the Beef Cattle Incentive Scheme do not sell milk and dairy products has increased to 61 000, with some 500 000 cows.

Finland has continued to apply measures to reduce agricultural production, except for a few minor commodities. Nevertheless, the fall in dairy production was partly offset by increases in pig and egg production. New measures were introduced at the beginning of 1972 to discourage the "reverse": they could lead to a reduction in income for the large pig and egg producers who have recently increased their output.

Structural reform programmes

Governments have continued or inaugurated socio-structural action programmes aimed at increasing the size and the efficiency of farmholdings. Agricultural employment continues to decline, encouraged financially in many countries that support this shift as a means of accelerating the change toward larger farms. In contrast, measures have been taken to keep farmers in certain less favoured rural zones, such as mountainous areas, where they play an important role in the protection of the environment.

In France, rural reconstruction organizations acquired 80 000 hectares in 1971 from abandoned farms and distributed 72 000 (11 percent more than in 1970) to farmers wanting to enlarge their holdings. About 53 000 farmers received pensions in compensation for leaving the land. Since this scheme began in 1964 more than 4.8 million hectares have been transferred. The number of producer groups has increased by 9 percent, the largest part of this increase being related to the livestock sector. New subsidies were paid in 1971 to encourage groups of both dairy and beef farmers to improve their technical and commercial capacity. Public funds are also to be spent in 1972 on mountain agriculture, with particular reference to collective grazing.

In the Federal Republic of Germany, the number of farmholders fell by 6 percent in 1971. There are, in 1972, about 1.4 million full-time farmers as against 2.4 million in 1960; by 1980 they will number less than 1 million. Investment subsidies were granted as from 1 July 1971 to improve certain types of farmholdings. Estimated funds for this purpose will be: DM 203 million in 1972, 230 million in 1973, 295 million in 1974 and 355 million in 1975. Aid to retiring or elderly farmers will be increased from 1 September 1972.

In Italy, the economic development plan for 1971-75 foresees that from 400 000 to 500 000 farmers will leave the land during this period. The exodus will bring out even more acutely the difference between north and south. However, regional programmes are likely to improve marketing and encourage structural reform. In August 1971, a law allocated 180 000 million lire to support policies in an extension of the second green plan 1966-70, and gave special emphasis to cooperation. A mountain development bill became law in December 1971 in which homogeneous mountain communities were defined. These communities are authorized to buy lands or to rent them for at least 20 years, and leave them uncultivated for the creation of natural reserves, forests or open spaces.

In the Netherlands, the scheme for assisting farm migration, inaugurated in 1963, was improved: besides a lump sum and monthly payments, a special premium will be allocated for areas freed or taken out of production to permit the enlargement of the remaining farms. Consequently, claims for assistance rose from 1 000 annually in 1968-70 to 5 000 in 1971. New policies to stimulate farmer cooperation and to encourage the formation of larger farms were inaugurated.

In 1971, the Small Farm Scheme in Ireland was enlarged. It gives assistance to selected farms which, with public help, could become economically viable.

In Denmark, a new law grants interest subsidies of up to 5 percent for investments in barns and pigsties. Another law provides means for further groupings of farms: since 1971 the maximum area for a newly consolidated holding is 100 hectares instead of 35.

In Austria, financial assistance amounting to 1 500 million schillings for five years has been arranged for mountain agriculture, particularly for investment in afforestation, machinery and land consolidation. Finally, in Spain, a law to improve land utilization was adopted.

Agricultural policies and problems

Ten years of common agricultural policy

Since 1962, the six countries of the European Economic Community have progressively established a common agricultural policy which has as its main feature a structure of common markets. This structure is mainly based on a system of price support, at different levels, through uniform regulations for all of its member countries. The agreement on price uniformity has enabled the establishment of a free circulation of products which, in its turn, was stimulated by the Community preference system. A uniform customs duty and price protection system is applied toward third countries, based on " threshold " prices, variable levies at the point of import and repayments at the point of export. To meet the expenses of this common policy, member countries are bound by a financial agreement.

After a transition period common prices were gradually applied for the principal products, thus drawing together the national markets: in 1966 for olive oil; in 1967 for cereals, rice, pork, eggs, poultry, oilseeds, fresh vegetables and fruit; in 1968 for milk and dairy products, beef and sugar; and in 1970 for wine, flax and hemp. Potatoes, veal, horse meat and alcohol are the only products for which common markets have to be set up.

The first series of common prices was set at a relatively high level for economic as well as social and political reasons. This was especially true for all cereals. Starting from 1968/69 or 1969/70, prices

TABLE 2-4. – EUROPEAN ECONOMIC COMMUNITY: PRICES EFFECTIVE IN 1972/73

	Indicative or target price		Intervention price	
	1972/73	Increase over 1967/68	1972/73	Increase over 1967/68
	Units of account[1] *per ton*	*Percent*	*Units of account*[1] *per ton*	*Percent*
Soft wheat	113.80	7.1	104.75	6.1
Durum wheat	132.60	6.1	153.80	6.1
Rye	105.45	12.5	97.46	11.4
Barley	104.25	14.2	95.70	12.6
Maize	101.75	12.3	79.31	3.0
Rice (husked)	211.49	16.7	—	—
Beef	750.00	[2]10.3	—	—
Veal	942.50	[2]3.0	—	—
Milk	117.70	[2]14.3	—	—
Butter	—	—	1 800.00	[2]3.7
Skim milk powder	—	—	540.00	[2]30.9
Sugar (minimum price for sugar beet)	—	—	17.68	[2]4.0

[1] 1 unit of account = U.S. $1.086 ($1.00 before devaluation). – [2] Increase over 1968/69.

remained relatively stable for two or three years because of surpluses, But for 1971/72 and 1972/73 prices had to be increased (Table 2-4) to cope with general inflation and the strong rise in production costs.

Nevertheless, compared with international market prices those of the Community remained considerably high because of their initial level. If 100 is taken as a base for supply prices at the borders, entry prices burdened with levies were as follows for 1970/71: soft wheat 189, barley 146, maize 141, white sugar 254, slaughtered pigs 153, beef 144, butter 473, and emmenthal cheese 165.

At times the rigidity of farm prices has placed national requirements against Community interests and difficult compromises have been necessary for market equilibrium. This has led to a maladjusted price structure which, in its turn, has contributed to large surpluses of certain commodities.

Community farm support prices and the variable import levies which protect them are calculated from a common unit of account at fixed exchange rates. However, following revaluation of their currencies in 1969 support prices in the Federal Republic of Germany and the Benelux countries have been respectively about 5 and 3 percent above the common level. The Federal Republic of Germany in particular has advocated retention of support price levels with compensatory taxes on trade with member states. After the devaluation of the United States dollar a meeting of ministers of agriculture from EEC countries in March 1972 agreed to adopt a working hypothesis that the unit of account, which has the same gold parity as the old dollar, would not be revalued and that all member countries would officially adopt the new parities worked out in Washington in December 1971. On that basis they agreed that those countries whose currencies had been revalued should be permitted to compensate their farmers for part or all of the resulting loss of income through fiscal measures.

The following indices (Table 2-5) show that during the last ten years agricultural production in the Community has increased at about the same rate as that of western Europe.

TABLE 2-5. – WESTERN EUROPE AND EEC: INDICES OF AGRICULTURAL PRODUCTION, 1961-63 TO 1971

	1961-63	1964-66	1967-69	1970	1971
	..... *1961-65 average = 100*				
European Economic Community	98	103	115	119	124
Western Europe	98	104	113	117	124

Altogether, the level of common prices does not seem to have exerted an exceptionally stimulating influence on production, undoubtedly because support prices in other western European countries (for example, the United Kingdom) were also high. However, because of the defective price structure, certain rigidities in techniques or in farm structures, and significant yield increases, large surpluses appeared for such important commodities as soft wheat, milk products, sugar and certain fruits and vegetables (apples, pears, peaches, tomatoes) so that market support has involved enormous financial burdens (Table 2-6). Export subsidies have been responsible for the major part of these expenses: in 1970, they amounted to 529 million units of account for cereals

TABLE 2-6. – EUROPEAN ECONOMIC COMMUNITY: EXPENSES BY GROUP OF COMMODITIES

	1970	1971 [1]	1972 [2]
	Millions of units of account		
Cereals and rice	803	750	983
Dairy products	934	700	632
Fats and oils	142	282	286
Fruit and vegetables	38	55	55
Sugar	184	199	210

[1] Budgetary estimate. – [2] Estimate of the EEC Commission.

and rice, 390 million for dairy products and 85 million for sugar. Community surpluses have put a pressure on international market prices which has increased the burden of payments for levies and subsidies.

Inside the Community the high level of support prices, and the associated expenses of such an agricultural policy, has led to much official and public discussion. In the opinion of many agriculture has emerged as a heavy financial burden for the Community. Outside the Community, its system of levies and subsidies and accompanying changes in traditional trade patterns were recognized as major events leading toward a deterioration in the international market in several main agricultural commodities.

To help reduce surpluses, the common price structure was modified from one harvest to another, mainly by increasing the price of coarse grains in relation to wheat, and of milk proteins in relation to butterfat. Other measures to lower production were also tried. In the autumn of 1969, for instance, when the surplus of butter and skim milk powder exceeded 300 000 tons, two types of payment were introduced to reduce milk production: one for the slaughter of dairy cows, the other to keep milk and dairy products from the market. About 540 000 cows (2 percent of the total) were eliminated. In the fruit and vegetable sector seasonal surpluses have become permanent. In 1970/71, 120 000 tons of apples, 63 000 tons of peaches and 620 000 tons of pears were withdrawn from the market by one means or another. To reduce quantity and improve fruit quality, an eradication payment of a maximum of 800 units of accounts per hectare was offered in 1970/71 for apple, pear and peach trees. More recently, in the spring of 1972, new incentives have been offered to stimulate beef production.

By June 1972 most surpluses had disappeared. The dairy situation has completely changed: the Community took a succession of measures in 1971 which would have been hard to foresee — the abolition of certain export subsidies, the reduction or elimination of import levies, and even heavy taxation of skim milk powder exports. However, the return to a position approaching equilibrium is due more to temporary factors (the weather, the external market situation) than to an internal supply adjustment, and there was some indication of stock buildup in early 1972. The sharp price increases announced for 1972/73 risk a return to the previous position of surpluses.

In spite of the large amount of financial aid the agricultural sector has received, one of the essential objectives of the Rome Treaty has not been accomplished: a standard of living for the rural population equal to the national average. The gap between individual farm incomes and the average national level cannot be established with precision. Nevertheless, it is significant that as measured by the share of agriculture in the GDP of the Community as a whole (Table 2-7), farm income is below half the national per caput income level.

TABLE 2-7. – EUROPEAN ECONOMIC COMMUNITY: AGRICULTURE IN GDP RELATED TO PROPORTION OF AGRICULTURAL LABOUR IN TOTAL ACTIVE POPULATION, 1969

	Belgium-Luxembourg	France	Italy	Netherlands	Fed. Rep. of Germany	EEC
	Percent					
Agricultural labour as part of total active population	5.6	14.9	21.2	7.6	9.6	13.9
Contribution to GDP	4.9	7.0	10.8	6.6	4.2	6.6

Since 1970, farmers' incomes do not seem to have improved compared with other categories as price increases granted have been largely offset by rises in production and living costs. Also, the rigid, uniform and centralized price system appears to have accentuated the income differences between the various categories of farmers in the different regions. Price support has been far more beneficial to large farm holdings than to smaller ones, which generally have received least help under the Community system.

SLOWNESS OF STRUCTURAL CHANGE

Until now, the common agricultural policy has been geared mainly toward the organization and operation of markets, without being too much concerned with modernization of farms. While market support in 1970 cost 2 215 million units of account to the common funds, expenses for structural reform have been limited to only 285 million since 1969. Undoubtedly this is partly because the majority of member states have for a long time been reluctant to commit the structural reform to Community authorities because of the economic, social and regional implications. This has been considered primarily a matter to be attended to by each country. The price policy in itself, while guaranteeing relatively high incomes for some, did not stimulate structural reform; rather, it helped to maintain marginal holdings. On the other hand, regionalization of agricultural prices, established because of the lack of a common transport policy, did not lead to a better geographical distribution of production.

Meanwhile, as the price and market mechanisms proved inadequate to improve farmers' incomes and living standards, the need to take action on production costs and farm structures has been increasingly recognized. Earlier, in December 1962, the Council of Ministers had proposed a framework to coordinate national structural measures, but it was never used. The funds distributed by the "orientation" section of the European Agricultural Guidance and Guarantee Fund were never allocated according to a global plan based on Community criteria. In mid-1967 the EEC Commission proposed the inclusion of projects supported by the fund into a common programme with priorities by types of action, sector and region. One essential aim was to include this structural action within the regional development plans, thus integrating it with the other economic sectors.

The Mansholt Plan, presented to the Commission in December 1968, proposed a vast programme of reforms for 1970-80, starting from the idea that the structural rigidity of farm holdings and farm land is in conflict with better incomes for farm labour and capital and that the present movement toward concentration of farm holdings is too slow. The Mansholt Plan foresees action in three main directions: the rapid reduction of the active agricultural population, which in 1980 should represent about 8 percent of the total labour force, as against 12.3 percent in 1970; assistance to farmers who, individually or in groups, would be willing to undertake changes permitting the adoption of modern farming techniques and higher living standards; and market improvements through the concentration of supply in farmers' cooperatives and a better market intelligence system.[1]

A new version of this plan was put forward in May 1970 which, while supporting the principle that centralized decision-making is indispensable to a common price policy, admits the necessity of decentralizing to the maximum extent the organization of structural changes, which are so dependent on local conditions.

In March 1972 three directives were adopted by the Council to put into action a resolution accepted a year earlier; these will finally permit a start to be made with the reforms recommended in the Mansholt Plan in three essential fields:

1. The modernization process will be stimulated in a selective way by giving support only to those who have a possibility to develop; that is, those who by means of a six-year development plan can expect to obtain an income comparable to those in nonfarm activities in their particular region. The support regulations include: the redistribution of land "freed" by structural changes, interest refunds for investments included in the development plan (except for land purchase), guaranteed loans, and financial assistance for the introduction of farm accounts and for the creation of farmers' groups. Except for irrigation and land consolidation, national support for investments is, in principle, prohibited. Member states can, depending on the regions, change or not apply all or certain of these arrangements. The European Agricultural Guidance and Guarantee Fund will reimburse 25 percent of the common expenses; in certain regions yet to be specified (especially in Italy) payments can amount to as much as 65 percent. The common programme is to be completed in 10 years.
2. Member states will introduce a system to encourage marginal and (mainly) small farmers to withdraw from agriculture, to help solve the problem of improving farm structures. This system includes a life indemnity for those farmers between 55 and 65 years who give up their farms, and a premium based on the area freed. In France, such an indemnity has existed since 1964, while the Federal Republic of Germany and the Netherlands have their own systems. The new Community system will benefit Italy most as it has no similar system and more than 20 percent of the population is active in agriculture.
3. Employment information for farmers and farm workers will be improved through the creation of information services, and the provision of advisers or counsellors to give information about alternative job opportunities, advice as to whether to leave or continue farming, and so on.

It must be underlined that this initiative of the common structural reform programme is an important step, even if it bears little resemblance to the original propositions made in December 1968. Without doubt the effectiveness of the measures will finally depend not only on the national authorities, who have the executive power, but also on the active participation of the farmers who, from the very beginning, have been encouraged to form groups and associations of groups. As far as these groups are concerned the Commission proposition on this matter, presented some years ago, will be decided upon in the autumn of 1972. Failing the adoption of the original ambitious programme in its entirety, modernization of the Community's agriculture will proceed, as in the past, by unequal steps, depending on the evolution of the economy and changes in attitudes. There is no doubt, however, that major steps have already been taken.

[1] For details of the Mansholt Plan, see *The state of food and agriculture 1969*, p. 40.

CHANGE IN TRADING PATTERNS

The Community imports about one third of the agricultural products traded in the world. It is therefore not surprising to find that the market's growth and, particularly, the common agricultural policy have aroused a lively apprehension and even a permanent critique among its trading partners. It is very difficult to measure precisely what effect this policy has had upon trade. What, for example, would have been the national agricultural policies of Common Market countries without integration? A large number of countries, developed and developing, have agricultural support policies. These are considered a necessary part of social and economic policy. Have they, too, negative repercussions on economic growth and the demand for agricultural products? The answers are difficult; history does not permit the comparison of hypothesis with reality. However, the analysis of Community trading in agricultural commodities does indicate certain trends (Table 2-8).

From 1960-62 to 1968-70 the value of exports increased by 116 percent, imports by 63 percent, and net imports by only 28 percent. How was this major trade development distributed among third countries and member countries? Table 2-8 shows that the Community, as it originally intended, is much less dependent on the outside world. From 1960-62 to 1968-70, its purchases in third countries increased by 35 percent, and from developing countries by 28 percent only; in marked contrast, intra-EEC imports rose by 182 percent. Exports to third countries increased by 51 percent, compared with 186 percent among member countries. However, net imports from third countries, increasing at 3.2 percent annually, were relatively high. Community preference has plainly been accepted by its members. For the main commodities, the proportion purchased from member countries in respect of total imports increased, in terms of value, as shown in Table 2-9.

In spite of increased self-sufficiency, the volume of purchases by the Community from third countries has grown more rapidly than imports into all other developed countries taken as a whole, and between 1960 and 1969, the latest year for which comparable data are available, imports into EEC from developing countries increased by 27 percent, compared with 23 percent in all other developed countries. Changes in the self-sufficiency ratio of the principal commodities, or groups of commodities, are shown in Table 2-10. As near- or self-sufficiency is reached, funds

TABLE 2-8. – EUROPEAN ECONOMIC COMMUNITY: AGRICULTURAL TRADE, 1960-62 TO 1968-70

	1960-62	1963-65	1966-67	1968-70	Annual growth, 1960-62 to 1968-70
					Percent
IMPORTS (U.S.$ million)	10 464	12 942	14 588	17 079	6.3
Origin (percent of total):					
Intra-EEC	19.0	22.3	25.6	32.9	13.9
Extra-EEC	81.0	77.7	74.4	67.1	3.9
of which developing countries	38.4	35.5	33.1	30.1	3.1
EXPORTS (U.S.$ million)	4 171	5 518	6 612	9 006	10.1
Destination (percent of total):					
Intra-EEC	47.4	52.1	56.3	62.8	14.0
Extra-EEC	52.6	47.9	43.7	37.2	5.4
Exports, f.o.b., as percent of imports, c.i.f.	39.9	42.6	45.3	52.7	

TABLE 2-9. – EUROPEAN ECONOMIC COMMUNITY: PROPORTION OF TOTAL IMPORTS OF SELECTED AGRICULTURAL COMMODITIES FROM MEMBER COUNTRIES, 1963 AND 1970

	1963	1970
	Percent	
Wheat	14	44
Barley	46	59
Maize	6	18
Cattle and meat	35	56
Butter	49	99
Cheese	53	74
Eggs	61	88
Fresh fruit	28	31
Fresh vegetables	53	56
Sugar	15	55

TABLE 2-10. – EUROPEAN ECONOMIC COMMUNITY: SELF-SUFFICIENCY RATIOS OF SELECTED AGRICULTURAL COMMODITIES

	1960/61-1962/63	1967/68-1969/70
	Percent	
Wheat	94	108
Barley	92	106
Maize	55	54
Sugar	102	103
Fresh vegetables	104	100
Fresh fruit	92	88
Beef	95	88
Pork	101	99
Fats and oils	38	41
Cheese	99	102
Butter	102	112

from import levies to protect EEC farm prices decline. In this respect the enlargement of the Community is significant, as the United Kingdom, in particular, still relies on food imports.

Outlook

At this stage it would be injudicious to project the future evolution of the common agricultural policy. It is clear that its development in coming years will be influenced by a number of new factors. First, there is the expected enlargement in membership which will significantly increase its already enormous production potential. Certainly, a higher level of agricultural prices will be a stimulant, in the short run, for farmers in new member countries, especially the United Kingdom. As many may fear, the self-sufficiency ratio will probably increase for a number of major commodities. On the other hand, under the influence of an enlarged Community, one may expect swifter changes in the structure of the agricultural sector. With a considerably smaller labour force and better farm-holding structures, it should be possible to reduce the present high cost of price support. In principle, supply should become more responsive to demand and, if necessary, it should be easier to impose supply restrictions.

Another important factor will be outside pressures. An increasing number of developed nonmember countries, as well as developing countries, will be requesting special bilateral or multilateral agreements to protect or enlarge their share of the Common Market. Moreover, the demand of developing countries for more international readjustments in agricultural production and trade will be strengthened. Given its dominant position in world agricultural imports, the Community cannot easily ignore these more urgent demands, nor apparently does it wish to do so. The trading problem of the European Economic Community with developing countries is not different from the trading problem of the rest of the world. It remains a question of stable prices for agricultural produce.

Finally, enlargement of the Community will not facilitate decisions. The common agricultural policy's past history is full of compromises, often very difficult ones. Agreement on acceptable solutions for all member countries will, in the future, require even more mutual tolerance and flexibility, which indirectly can influence the relationship of the Community with third countries.

Eastern Europe and the U.S.S.R.

The development of agriculture has been given a prominent position in the 1971-75 five-year plans of the U.S.S.R. and the eastern European countries, and growing emphasis is being given to improving the conditions of farm labour and expanding productivity through specialization and the application of technical innovations. Following extensive preparation, agreement has been reached among member countries of the Council for Mutual Economic Assistance (CMEA) on a plan for economic integration over the next 15 to 20 years, including the coordination of the targets of the various five-year plans.

Agricultural production

Regional agricultural production increased only slightly in 1971, although the longer term rate of growth was maintained in eastern Europe where output recovered substantially from the previous year when bad weather had been particularly widespread (Table 2-11). The increase in eastern Europe was mainly offset by a standstill in agricultural production in the U.S.S.R., as a result of less favourable weather than in 1970 in some of the main crop-producing areas. However, the level of output confirmed the longer term upward trend.

In the U.S.S.R., most crops were below 1970 levels. Cereal production, including pulses, fell to 181 million tons from 187 million in 1970, but the production of foodgrains remained at about the same level (wheat 98.7 million tons compared with 99.7 million in 1970). The sugar-beet crop was only 72 million tons compared with the previous 79 million tons. Production of sunflowerseed, which has declined steadily since 1968, was 5.7 million tons against 6.1 million the previous year, and the potato crop fell to 92 million tons from 97 million.

However, cotton production increased and for the first time reached a level of 2.4 million tons, while flax output reached 466 000 tons. State purchases of tea increased by nearly 3 percent and of grapes by 12 percent, but other fruits were below 1970 levels. Total production figures for these products are not yet available.

TABLE 2-11. – EASTERN EUROPE AND THE U.S.S.R.: INDICES OF FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971
	..... *1961-65 average = 100*					*Percent*	..... *1961-65 average = 100*					*Percent*
FOOD PRODUCTION												
Eastern Europe	118	120	119	117	123	+ 6	115	116	114	111	117	+ 5
U.S.S.R.	121	128	125	136	135	—	115	121	117	126	124	— 1
REGIONAL	120	126	123	129	131	+ 1	115	119	116	121	122	+ 1
AGRICULTURAL PRODUCTION												
Eastern Europe	118	120	119	117	123	+ 5	115	116	114	111	116	+ 5
U.S.S.R.	121	128	124	135	135	—	115	120	116	125	124	— 1
REGIONAL	120	125	122	129	131	+ 1	115	119	115	121	121	+ 1

[1] Preliminary.

The performance of eastern European agriculture improved considerably in 1971, although weather conditions, generally favourable in the spring and early summer, tended to worsen in the latter part of the year and affected certain crops and also the rate of growth in some countries.

The highest growth rates of total agricultural output were achieved in Romania and Hungary, countries which in 1970 had incurred heavy losses from floods and excessive rains. Output in Romania increased by 18 percent, and in Hungary by 9 percent. Good results were obtained in Poland and Czechoslovakia where output expanded faster than in 1970, but in Bulgaria growth slowed down. Little is known of developments in Albania, but the grain harvest was reported to be good. Partial information from the German Democratic Republic indicates that weather was unfavourable and that the overall production target was not met. However, deliveries of grains and potatoes were made according to plan.

Good weather in the first half of the year contributed toward greatly increased harvests of coarse grains and wheat in most countries. The record crop in Romania, estimated at 13.4 million tons, was 27 percent above that of the preceding year, while production of grains in Hungary expanded by 31 percent and reached the record 1969 level with wheat exceeding all past figures. Record harvests of wheat and coarse grains of more than 8 million and 19 million tons, respectively, were reported in Czechoslovakia and Poland. In Bulgaria wheat and other bread grains remained at 1970 levels, while maize output increased by nearly 6 percent.

The improvements in agricultural production resulting from large grain crops were slightly offset by shortfalls in other crops in certain countries as a result of prolonged drought in the late summer and autumn. Declines in fodder crops and potatoes were reported in Czechoslovakia, the German Democratic Republic and Poland. In Poland, the largest potato producer of the area, the harvest was only some 40 million tons, about 17 percent less than the 1966-70 average. Sugar-beet production decreased everywhere (the reduction was particularly pronounced in Czechoslovakia), except in Romania where it expanded by 35 percent. Small declines in sugar-beet production in Bulgaria and Hungary were due to reductions in area. Fruit and vegetable crops were generally below expectations, except in Romania where total output of vegetables increased by 25 percent; production of sunflowerseed and potatoes in this country also increased.

Output of livestock products in the U.S.S.R. expanded by 3 percent in 1971. The greatest increase (11 percent) was achieved for eggs, with 45 000 million units. Meat production amounted to 13.1 million tons (slaughter weight), an increase of 7 percent over 1970, compared with only 6 percent between 1968 and 1970. This increase reflected principally the growth in pigmeat production which expanded by 16 percent to 5.2 million tons. However, wool production increased by only 1 percent to 424 000 tons, and milk production remained at the 1970 level of 83 million tons as yields declined slightly. Livestock numbers increased but growth in the state and collective sector was not matched by that of private family holdings. Pig numbers went

up on state and collective farms by 9 percent, but the overall increase was 20 percent to 67.5 million head. Total cattle numbers increased by 4 percent to 99.2 million (on state and collective farms the increase was about 4 percent).

In eastern Europe, as a result of intensified efforts to improve conditions in the animal sector and to accelerate growth, animal production increased. Foot-and-mouth disease control programmes have begun to give results, but reduced fodder supplies affected cattle-raising in some countries. Cattle numbers increased in Bulgaria by almost 2 percent, and in Romania by 3.7 percent; they increased somewhat in Czechoslovakia, the German Democratic Republic and Poland but decreased in Hungary. Despite the high average weight of slaughtering cattle (523 kilogrammes live weight, against 481 kilogrammes in Czechoslovakia and 351 kilogrammes in Poland), Hungary esperienced some difficulties in beef production, which were reflected in a stagnating volume of exports.

On the other hand, pig and poultry production, increasingly concentrated on large-scale specialized farms employing industrial production methods, continued to expand rapidly. All countries registered increases in pig numbers at rates ranging from 6 percent in Romania to 10 percent in Czechoslovakia. Average weights showed small variations from country to country (between 112 and 122 kilogrammes live weight), and compared favourably with those of western Europe. Significant increases in poultry numbers and egg production were also reported for most countries. Increased meat production in the area (a small decline occurred in Romania only) is largely based on greater supplies of slaughtering pigs and poultry.

Milk production rose in all countries. As in earlier years, annual milk yield per cow was by far the highest in the German Democratic Republic (3 370 litres, compared with 2 000 to 2 500 litres in other countries of the area).

Efforts to improve the technical base of agriculture continued in 1971. Increased deliveries of tractors and other farm machinery were reported for the U.S.S.R. and a number of eastern European countries. About 312 000 tractors were delivered to agricultural holdings in the U.S.S.R., but an important proportion of these were replacements. However, the increment to overall horsepower was greater than the net growth in numbers, due to technical improvements in new equipment.

These improvements have raised questions in the U.S.S.R. regarding the optimal use of this machinery and the need for a stable and skilled labour force. Because production quotas no longer correspond to the possibilities of the new higher powered engines and, in fact, often create unfavourable conditions for the performance and productivity of this equipment, it has been agreed that over a two-year period new technical output quotas should be determined. To attract labour and encourage specialization, improvements are being made in farm labour conditions (wage increases are discussed below).

Work on land improvement, particularly irrigation, continued in 1971. In Romania, the irrigated area expanded by 230 000 hectares. In the U.S.S.R., the decision on land reclamation published in May 1971 represents the practical implementation of the targets announced in the five-year plan. The main points envisaged are the irrigation of an area of 3 million hectares and the draining of 5 million hectares. During 1971-75, the State will invest 26 600 million roubles in these works, and between 1973-77 a number of factories specialized in the production of machinery for land reclamation will be constructed. Over the longer term, plans are being elaborated for the confluence of the northern rivers with the Volga and of the Siberian rivers with the basins of the Amu Darya and the Syr Darya. These important measures are aimed not only at increasing irrigation but also at preserving the water resources of the Caspian and Aral seas.

The five-year plans and related agricultural policies

The November 1971 session of the Supreme Soviet confirmed the five-year plan (1971-75) adopted at the Party's XXIV Congress (see *The state of food and agriculture 1971*, p. 56). No amendments were made to agricultural targets, but various objectives concerning human welfare were emphasized. These included not only salaries and pensions, but also per caput consumption targets (Table 2-12).

For 1972, increases of 6.2 percent in national income and 6.9 percent in industrial production have been targeted. Investments in agriculture will reach 22 900 million roubles, or 9 percent more than in 1971. Mineral fertilizers delivered to state and collective farms are to be increased by 7 percent to 53.5 million tons, and the delivery of tractors (316 000) will be a little over the previous year's figure.

The gross income of the collective farms in 1971 was slightly below the 1970 level, but money wages of collective farm workers increased by 3 percent (on the other hand, the reduction in privately held livestock could lead to a decrease in their private income). To encourage specialization, incentives are given to state and collective farm workers who deal with machinery and who remain on a particular farm for an extended period. Their wages are to be increased by as much as 18 percent by 1973, and other incentives include special instalment allow-

TABLE 2-12. – U.S.S.R.: ACTUAL AND PLANNED FOOD CONSUMPTION PER CAPUT, 1970 AND 1975

	1970	1975
	Kilogrammes	
Meat products	48	59
Dairy products	307	340
Fish products	15	22
Fruit	35	50
Vegetables	82	109
Sugar	39	43
	Units	
Eggs	159	192

ances, as well as salary premiums and additional leave, and the cancellation of up to 35 percent of housing loans according to length of service.

Pensions for collective farm workers were increased in June 1971 and the rates now run from a minimum of 20 to a maximum of 120 roubles per month (for employees and industrial workers such rates are 45 to 120 roubles). Some modifications favouring farmers were introduced into the law on agricultural taxation, and the rural school system is being improved.

For implementation of plan targets, particularly in the expansion of livestock production, further progress was made in establishing large-scale enterprises. It was decided that 1 170 big state complexes for meat and dairy production would be created (228 specialized in pig fattening, 307 in cattle for meat and 635 in dairy production), and that 585 poultry "factories" would be constructed or enlarged. For the biggest of these enterprises feed will be provided by the state industry, while the smaller will have their own feed crops and preparations.

However, the concentration on large enterprises for livestock raises the question of forage availability. Efforts are being made to increase irrigated land for forage and watered pastures. The quantity of chemical fertilizers utilized for feed crops is to be expanded from 7 million tons in 1970 to 21 million in 1975 to increase yields.

While the industrialization of meat and dairy production is at its beginning, important achievements have been made in the production of eggs and poultry meat in poultry factories. The number of these factories increased from 271 in 1965 to 483 in 1970, and output has grown from 1 769 million eggs to 6 764 million (representing 36 percent of state and collective farm production), but more than 50 percent of total egg production still comes from private family farms.

The development of the federal organization of collective farms initiated in 1969 and further elaborated in 1971 aims primarily at the implementation of government programmes. However, it also provides an institutional framework for improving and coordinating collective farm activities, and should play an important role in the establishment of the agro-industrial complexes mentioned above.

The recently adopted 1971-75 plans of the eastern European countries contain economic and social objectives of high priority, but special emphasis is given to rapid increases in the material and cultural standards of the population. Following the strategy which had been adopted around the mid-1960s, growth is to be achieved through a better utilization of production factors rather than by additions to the labour force and capital inputs. In the current period particular attention will be devoted to the promotion of basic and applied research and to the accelerated introduction of technical innovations in production.

The planned rates of growth of national incomes are in line with, or lower than, those recorded in the preceding five-year period (Table 2-13), except in Romania, where significantly faster growth is expected. Emphasis continues to be given to the importance of the agricultural sector. However in line with the more flexible attitude toward agricultural planning which had been already adopted in the 1966-70 plans of most countries, the published material contains few quantitative targets, and these should be interpreted as orientation targets in most cases.

The improvement of the agro-technical base has been complemented since 1965 by reforms in price relationships, in farm organization and management and by improvements in the economic and social conditions of the farm population. In Hungary the gap between farm incomes and the incomes of

TABLE 2-13. – EASTERN EUROPE: GROWTH OF NATIONAL INCOMES

	1966-70		1971-75
	Plan	Actual	Plan
	Percent[1]		
Albania	8.0	9.2	9.2 – 9.9
Bulgaria	8.5	8.6	8.0 – 8.5
Czechoslovakia	4.1 – 4.4	6.8	5.1
German Dem. Republic	5.5	5.2	4.9
Hungary	3.5 – 3.9	6.8	5.5 – 6.0
Poland	6.0	6.0	6.6 – 6.8
Romania	7.0	7.7	11.0 – 12.0

[1] Annual compound rates.

TABLE 2-14. – EASTERN EUROPE: GROWTH [1] OF GROSS AGRICULTURAL OUTPUT, 1961-65 TO 1966-70, AND 1971-75 PLAN

	1961-65 over 1956-60	1966-70 over 1961-65	1971-75 over 1966-70
	Percent		
Albania	5.2	...	8.5 – 9.2
Bulgaria	4.3	4.7	3.2 – 3.7
Czechoslovakia	0.4	3.5	[2]2.5
German Dem. Republic	[2]1.8	[2]1.9	2.4
Hungary	1.6	2.8	2.8 – 3.0
Poland	2.6	2.9	[3]3.4 – 3.9
Romania	3.2	4.2	6.3 – 8.3

[1] Annual growth rates corresponding to the increase between two successive five-year averages. – [2] FAO estimate. – [3] Based on planned increase in 1975 over 1970.

the wage and salaried workers was already virtually eliminated in 1970, and in 1971 money incomes of farmers expanded by 17 percent (6 to 7 percent in real terms) against a 7 percent increase in wage and salary incomes. Money incomes of members of cooperative farms and those employed in state farms in Romania rose by 11 percent. In addition all the social benefits enjoyed by wage and salaried workers were extended to the active and retired cooperative farm members. Money incomes of farm workers increased significantly also in Poland. At current prices, state purchases of agricultural products, which normally correspond to about four fifths of the total money incomes of farmers, rose by 15 percent, half this rise being due to increases in prices for livestock products. Incomes from agriculture in Czechoslovakia increased by 2.4 percent, about the same as in 1970.

The planned 1971-75 growth rates in the agricultural sector generally do not exceed those achieved in the preceding five-year period (Table 2-14). Only Albania and, to a lesser extent, Romania have particularly ambitious targets. At the end of the 1960s, when total supplies of food per head in other eastern European countries already exceeded 3 000 calories, Albania was only approaching the 2 500-calorie level, and the development of agriculture in this country therefore continues to be a crucial issue. In Romania, crop production is subject to wide fluctuations as a result of drought, and efforts are being pursued to improve soil conditions through irrigation and reclamation work. There is also scope for accelerating growth by applying more intensive production methods. Romanian consumption of fertilizers per hectare is less than half that of Hungary or Bulgaria, and is well below one third that of Czechoslovakia. The number of tractors per 1 000 hectares is lower than in either Hungary or Bulgaria and hardly exceeds one third the number in Czechoslovakia.

The German Democratic Republic plans for faster growth, and so does Poland. There is no firm target in the plan for Czechoslovakia, but according to reports the planning authorities do not aim at maintaining the rapid growth achieved in 1966-70. The basic aim in the current period is to achieve sufficient growth to meet additional domestic demand plus moderate increases in availabilities of selected products for export. Agricultural growth in Hungary is expected to continue unchanged, whereas Bulgaria plans for slower growth compared with the achievements in the two preceding five-year periods. A more selective approach is being taken toward agricultural expansion in this country, and increased emphasis is given to quality products, particularly for export.

Almost all countries of the region have greatly increased their efforts to develop animal production — which for many years had been the lagging sector of eastern European agriculture. Domestic demand for meat and other livestock products has been increasing, but they are also considered, particularly in Poland and Hungary, the most promising agricultural products for export to western Europe. At present they account for almost 40 percent of eastern European agricultural exports to western Europe, with fruit and vegetables ranking second.

Separate targets for the crop and animal sectors are to be found only in the Polish and Hungarian plans (Table 2-15). In contrast with 1966-70 developments, animal output is to grow faster than crop output in both countries, where the highest priority is given to the expansion of meat production. Output of meat in Poland is planned to reach 3.68 to 3.74 million tons (live weight) in 1975 against some 3 million in 1970. In Hungary, total output of beef

TABLE 2-15. – HUNGARY AND POLAND: INDICES OF AGRICULTURAL OUTPUT, ACTUAL AND PLANNED

	1966-70	1971-75
HUNGARY	*1961-65 = 100*	*1966-70 = 100*
Total gross output	115	115 – 116
Crop output	116	114 – 115
Animal output	114	116 – 117
	1970	1975
POLAND	*1965 = 100*	*1970 = 100*
Total gross output	109.2	118 – 121
Crop output	110.2	117 – 120
Animal output	107.8	119 – 121

and pigmeat in 1975 should be 21 percent higher than in 1970, which is considerably above the planned increase for livestock output as a whole.

In the crop sector, output of grains should grow faster in Poland (an increase of 29 to 34 percent in 1975 over 1970) and in Hungary (25 percent on the same basis), both countries having registered small increases between 1965 and 1970. Poland's output of sugar beet is expected to rise by 16 to 19 percent, whereas that of potatoes is to stay at the 1970 level.

Judging by data on procurement, production of grains in Czechoslovakia should develop at a somewhat slower pace than in the preceding period, whereas the Bulgarian plan does not provide for a further expansion; in fact, the average production level in 1971-75 in Bulgaria is planned to decline by 2 percent compared with the 1966-70 average. However, the Bulgarian plan aims at fast increases in green fodder (35 percent above the 1966-70 average) and vegetables (30 percent). Grain production in Romania is expected to attain a yearly average of some 16.3 to 17.5 million tons (a 26 to 35 percent increase) compared with about 13 million tons in the preceding period. The fastest expansion in the crop sector of this country is expected for vegetables (72 to 85 percent above the 1966-70 average). As in Bulgaria, the planned expansion of vegetable output is motivated by export considerations.

In most countries, increased crop production is to be achieved primarily through higher yields. Compared with 1970, the quantity of fertilizers (pure content) to be applied in 1975 is planned to increase by about 30 percent in Czechoslovakia and by 54 to 60 percent in Hungary, Poland and Bulgaria. Targets for the delivery of tractors and combine-harvesters are given in the plans of Czechoslovakia, Poland and Romania, but plans of other countries also contain numerous references to further mechanization of the crop and livestock sectors. Virtually all plans speak of the large-scale introduction of biological innovations, the broader use of agricultural services of various kinds, and of the development of closer links between agriculture and related industrial branches. Work on soil improvement will receive particular attention in Albania, Czechoslovakia, Hungary and Romania. Plans for all countries emphasize rationally organized large-scale farming.

Measures being taken to assist the implementation of plan targets include tax reductions on income gained from private plots of cooperative farm members in Romania and assistance for livestock raising on private holdings in Hungary. In Poland, new laws and regulations practically recognize the cultivator as the land owner, and the move toward consolidation of farms has led to the adoption of measures which facilitate the sale and purchase of land. Taxes imposed on agricultural holdings, especially in lower income areas, are reduced significantly, whereas producer prices for milk, meat and other livestock products have been raised. The decision taken under political pressure to abolish, as of January 1972, the system of compulsory deliveries of grains, meat and potatoes was particularly important. These measures, together with certain tax reforms, are expected to stimulate investment on nearly 1 million private farms. The 25 percent increase in total agricultural investments in Poland in 1971-75 (over 1966-70) is expected to be achieved through rises of 34 and 18 percent in private and state investments, respectively.

TABLE 2-16. – EASTERN EUROPE: SHARE OF AGRICULTURE IN TOTAL FIXED INVESTMENTS IN FOUR COUNTRIES, ACTUAL AND PLANNED

	1966-70	1971-75
	..... *Percent*	
Czechoslovakia	11.9	10.7
German Dem. Republic	18.3	15.0
Hungary	19.2	12.5
Romania	16.4	15.8

However, in four countries for which data are available (Table 2-16), the share of agriculture in total fixed investments will be reduced, the largest reduction being planned in Hungary. A decline may occur also in the traditionally high share of agricultural investments in Bulgaria.

The CMEA integration plan

At the end of July 1971, the countries associated in the Council for Mutual Economic Assistance (CMEA) [2] agreed on a programme for economic integration over the next 15 to 20 years, which, however, is not to be accompanied by the creation of supranational bodies, although at the fourteenth meeting of CMEA in May 1970 it was decided to establish the International Bank for Investments, which will represent an essential tool in the action of the new economic pool.

The coordination of five-year plans is considered as the basis for planned development and cooperation. Already at the end of 1970, representatives of CMEA countries met to review the targets of the various five-year plans (1971-75) which were announc-

[2] Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Mongolia, Poland, Romania, U.S.S.R.

ed during 1971. Tables 2-17 and 2-18 give some indication of the complementary development envisaged.

Within the community, specialization and the division of labour will be pursued. Industrial aggregates involving several countries will be organized (for example, the "Intermetal"), and the more advanced countries of CMEA are to extend assistance to less developed members. Thus Mongolia will receive credits, technical help and even manpower. Exchange of scientific and technical information is to be promoted among CMEA member countries.

Trade will be regulated by long-term contracts determining, for the principal products, fixed quotas to be exported or imported. Most agricultural commodities are included in this group, and common standards are to be established.

The development of trade, credit and common investments will be facilitated by the free convertibility of the member countries' currencies based on a convertible rouble. However, the gold standard of the convertible rouble and its relation to various currencies are to be determined only by the end of 1973. The use of the convertible rouble will not be limited to CMEA member countries, but will be extended to third countries also, especially to socialist countries not in the CMEA pool, and developing countries.

TABLE 2-17. – EASTERN EUROPE AND THE U.S.S.R.: SELECTED GROWTH TARGETS OF CMEA COUNTRIES FOR 1975

	National income	Industry	Agriculture	Foreign trade
	..... *1970 = 100*			
Bulgaria	147–150	155–160	117–120	160–165
Czechoslovakia . .	128	134–136	114	136–138
German Dem. Rep.	126–128	134–136	117	160–170
Hungary	130–132	132–134	115–116	140–150
Mongolia	130–133	153–156	122–125	128–130
Poland	138–139	148–150	118–121	156
Romania	168–176	168–178	136–149	161–172
U.S.S.R.	137–140	142–146	120–122	133–135

TABLE 2-18. – EASTERN EUROPE AND THE U.S.S.R.: PROJECTED INCREASES IN VOLUME OF TRADE BETWEEN COUNTRIES, 1971-75

Origin/destination	Bulgaria	Czechoslovakia	German Dem. Rep.	Hungary	Poland	Romania	U.S.S.R.
	..... *1966-70 = 100*						
Bulgaria	×	200	183	170	200	190	157
Czechoslovakia. . .	200	×	150	160	180	150	143
German Dem. Rep.	183	150	×	166	170	170	156
Hungary	170	160	166	×	140	170	150
Poland	200	180	170	140	×	180	167
Romania	190	150	170	170	180	×	135
U.S.S.R.	157	143	156	150	167	135	×

The collaboration among the contracting parties is extended to all fields affecting agriculture and food industries, and includes scientific and technological mutual help, development and exchange of selected seeds and animal breeds, and common efforts to ensure that by 1985 all CMEA countries will have adequate supplies of tractors and other machinery, as well as pesticides. Machinery and fertilizers are to be standardized. These measures represent an enlargement of current CMEA activities, but the programme contains new initiatives also.

Before the end of 1972, the organization will elaborate, on a commonly accepted methodology, balances to 1985 between the demand for food products and their agricultural and industrial production. These balances should serve as a basis for coordinating future production plans and for redistributing surpluses through long-term trade agreements. Provision is also to be made for expected increases in trade in agricultural products with third countries. Before the end of 1973 agreements should be concluded on specialization in agricultural and food industries at the country level, while a system of common planning for several commodities is to be studied.

North America

Agricultural production in North America was 9 percent larger in 1971. Additional crop production accounted for almost all the increase. Foreign trade in agricultural commodities also increased. Exports and imports were each 4 percent above the 1970 volume, and 9 percent and 1 percent respectively above the 1970 value. There was a sharp rise in the region's stocks of wheat and feedgrains at the end of the 1971/72 season. The increase in gross farm incomes was largely offset by higher production expenses and net farm incomes showed only a small rise.

The revival of the Canadian economy which started in the autumn of 1970 continued through 1971. Gross national product rose by 9.1 percent at current prices

and 5.4 percent at constant prices. Although employment rose, 6 to 7 percent of the labour force remained unemployed. The index of consumer prices continued to rise at an accelerated rate; the December 1971 index was 5 percent above the December 1970 level. The Government's fiscal policies were expansive, with lower personal and company taxes and increased government expenditures. Monetary policies were also expansive. Interest rates were lower. A broadly-based rise in consumer expenditures, particularly on durable goods and private housing, continued to lead the revival. There was a sharp swing away from the foreign trade sector as the source of stimulus for the economy. The trade surplus diminished during the year but was nevertheless second only to the very large 1970 surplus. The Canadian dollar continued to float and Canada's international liquidity reserves rose by 12 percent during the year.

The United States economy made a significant though incomplete recovery in 1971 from its 1969/70 mini-recession. GNP rose by 7.5 at current prices and 2.7 percent at constant prices. Expansive fiscal and monetary policies brought lower interest rates and increased personal incomes. Consumer expenditures for goods, services and housing were well above the 1970 levels. The index of consumer prices continued to rise throughout the year; however, the rate of increase was slowed by the Government's 15 August price freeze, and the index in December was only 3.3 percent above the December 1970 level. Industrial production failed to rally until the fourth quarter, and unemployment remained at about 6 percent. Increased exports did not balance growing imports and the trade balance was in deficit during the last three quarters of the year. Deterioration in the balance of payments brought increased international pressure on the currency and a massive outflow of dollars from the United States took place in the second and third quarters. The problems of unemployment, inflation and balance of payments brought government action in mid-August to freeze prices and wages, to suspend convertibility of the dollar, and to impose a 10 percent surcharge on many imports. In November, the freeze gave way to more flexible restraints on prices and wages. The rate of increase in prices slowed after the freeze, although inflationary pressures remained strong. Industrial production rallied, but unemployment continued to fluctuate around the 6 percent level. Although suspension of convertibility considerably reduced the dollar outflow, the extent of the impending devaluation of the dollar remained uncertain until mid-December. The United States official reserve transactions during 1971 showed a deficit of approximately $30 000 million.

Agricultural production

Agricultural production in North America in 1971 is estimated to have exceeded the 1970 level by 9 percent, the largest year-to-year percentage increase in more than 20 years and probably the largest ever in actual volume (Table 2-19). Crop production accounted for almost all the increase. Wheat and feedgrain production had been sharply curtailed in 1970 by the LIFT programme for wheat in Canada

TABLE 2-19. – NORTH AMERICA: INDICES OF FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971[1]	Change 1970 to 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	..... *1961-65 average = 100*					*Percent*	..... *1961-65 average = 100*					*Percent*
FOOD PRODUCTION												
Canada	106	115	114	104	123	+ 18	98	105	103	92	107	+ 16
United States	116	115	115	114	125	+ 9	110	109	107	105	114	+ 8
REGIONAL	115	115	115	113	124	+ 10	109	108	107	104	113	+ 9
AGRICULTURAL PRODUCTION												
Canada	105	115	115	107	122	+ 14	97	105	104	95	106	+ 12
United States	109	110	110	109	118	+ 8	104	104	102	101	108	+ 7
REGIONAL	109	111	110	109	119	+ 9	103	104	102	100	108	+ 8

[1] Preliminary.

and by corn leaf blight and drought in the United States. Perhaps as much as half of the 1971 increase in North America can be attributed to the nonrecurrence of these exceptional features of the 1970 season.

Wheat production in the region, although larger than the 1970 harvest by 12.5 million tons, approximated the 1967-69 average. There was, however, a significant shift in the location, from Canada to the United States: whereas Canada accounted for 30 percent of the region's wheat production in 1967-69, it produced only 24 percent in 1971 (see below). Feedgrain production was higher by 30 percent in the region. In the United States, with stocks depleted during the 1970/71 season and the possible recurrence of corn leaf blight, the Government relaxed its restrictions for the 1971 harvest and the maize area rose by 12 percent. Without blight and drought, yields averaged 21 percent above the 1970 level (3.5 percent above the previous record level of 1969) and production rose by 35 percent to 141 million tons (16 percent above the previous record harvest of 1967). For the whole region, maize production increased to 144 million tons (17 percent above 1967). The United States also harvested record crops of barley and sorghum. In Canada barley production was higher by 45 percent as the area continued to expand. Production of oilseeds was also higher, with another record soybean crop in the United States and a further sharp increase in rapeseed production in Canada. The linseed harvest, however, was down sharply in both countries. In the United States, production of rice, sugar and cotton showed little change. Tobacco production was lower by more than 10 percent in each country. Fruit and vegetable harvests in both countries were again slightly higher.

Livestock production is estimated to have risen only slightly. Production of beef and veal rose by about 1 percent in each country. Pork production was also larger, by 14 percent in Canada and 10 percent in the United States. Poultry meat and egg production continued to rise in both countries. Milk production was again slightly lower in Canada and slightly higher in the United States, with a very small net increase for the region.

Trade in agricultural products

North America's foreign trade in agricultural commodities was again larger in 1971. Exports increased by 4 percent in volume and 9 percent in value (Table 2-20), and imports by 4 percent in volume (Table 2-21) and 1 percent in value.

The volume of wheat and flour exports was slightly higher than in 1970, as larger shipments from Canada more than offset a reduction of about 8 percent

TABLE 2-20. – NORTH AMERICA: INDICES OF VALUE OF EXPORTS OF AGRICULTURAL PRODUCTS

	Share of total agricultural exports in 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	Percent	..... *1957-59 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	151	146	132	169	184	+ 9
Food and feedstuffs	85	174	165	152	202	217	+ 7
Wheat and wheat flour	25	153	140	102	144	154	+ 7
Feedgrains	15	205	176	163	213	216	+ 1
Rice	3	292	319	319	282	236	— 16
Oilseeds and vegetable oils	22	222	226	234	358	406	+ 13
Soybeans	17	330	343	347	513	559	+ 9
Oilseed cake and meal	6	551	583	627	786	910	+ 16
Meat and animal fats	7	124	121	142	172	189	+ 9
Dairy products	2	72	73	76	107	142	+ 32
Beverages and tobacco	7	144	153	158	143	137	— 4
Tobacco	7	144	153	158	143	137	— 4
Raw materials	8	66	67	45	55	82	+ 48
Cotton	7	65	64	39	52	82	+ 56

[1]Preliminary.

TABLE 2-21. – NORTH AMERICA: INDICES OF VOLUME OF IMPORTS OF AGRICULTURAL PRODUCTS

	Share of total agricultural imports in 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	Percent	..... *1957-59 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	113	124	115	119	123	+ 4
Food and feedstuffs	47	130	139	141	151	147	— 3
Sugar	14	108	113	110	119	119	—
Fruits	6	110	115	113	116	121	+ 4
Oilseeds and vegetable oils	5	139	132	133	143	150	+ 5
Meats	14	202	224	247	268	253	— 6
Beef and veal	9	246	275	323	366	353	— 4
Beverages and tobacco	41	110	123	104	105	117	+ 12
Coffee	28	102	120	97	94	104	+ 10
Cocoa	5	133	109	102	131	147	+ 12
Tobacco	4	144	160	155	158	180	+ 13

[1]Preliminary.

in those from the United States following lower exports on concessional terms and the disruptive effects of dock strikes. Export prices averaged higher and the value of the region's wheat and flour exports was 7 percent above 1970. The volume of feedgrain exports was also slightly higher in 1971, as larger shipments, again from Canada (particularly of barley), offset a reduction of 5 percent in those from the United States. Rice exports from the United States were lower by about 16 percent in value and 6 percent in volume. Exports of oilseeds and vegetable oils were up by 2 percent in volume and 13 percent in value. Soybean shipments, almost entirely from the United States, were about 3 percent below the record 1970 level, although the value was higher by about 9 percent. Exports of most other oilseeds (particularly rapeseed from Canada), vegetable oils and oilseed cake and meal were larger in terms of both volume and value. Cotton exports from the United States were notably higher, by 38 percent in volume and 56 percent in value, reflecting smaller supplies available from other exporting countries. Exports of tobacco from the United States were smaller by 7 percent in volume and almost 4 percent in value.

The value of agricultural exports from the United States reached a record level in 1971. However, the increase (6 percent) was notably smaller than in 1970 (22 percent), partly because of dock strikes which hampered shipments during the latter half of the year. The increase resulted mainly from higher prices, reflecting stronger foreign demand and limited world supplies of major commodities, such as soybeans, soybean meal, cotton and inedible tallow. The overall volume index showed relatively little change from that of 1970. Virtually all the increase consisted of commercial shipments under credit sales programmes (Commodity Credit Corporation short-term credits, and Export-Import Bank loans and medium-term guarantees) and barter contracts for overseas procurement for United States government agencies.

Shipments to other developed countries continued to account for about two thirds of the total agricultural exports from the United States. Shipments to these countries were almost entirely commercial sales. The value of sales to western Europe was higher by 14 percent and accounted for 38 percent of total United States agricultural exports. The increase in exports to the Common Market (15 percent) was slightly greater than that to the rest of western Europe. Exports to Canada and Japan, the two other major outlets, were lower than in 1970, by 8 and 12 percent respectively. Shipments to developing countries were 8 percent higher in value than in 1970. Commercial sales, which accounted for virtually all this increase, provided 61 percent of total United States agricultural exports to developing countries in 1971, compared with 58 percent in 1970 and 50 percent in 1969.

The value of concessional exports was approximately the same as in the two preceding years (Table 2-22). These again went mainly to Asian countries, including India, Indonesia, the Republic of Korea, Pakistan and the Republic of Viet-Nam. Sales for local currencies were again lower, as the phasing out of these operations under Public Law 480 was completed.

TABLE 2-22. – UNITED STATES: AGRICULTURAL EXPORTS,[1] CONCESSIONAL AND COMMERCIAL

	1966-68 average	1969	1970	1971	Share of 1971 total
CONCESSIONAL	*.....Million U.S. dollars.....*				*Percent*
Foreign currency sales[2]					
Dollar credit sales[2]	697	337	276	171	2
Donations[2]	272	428	490	509	7
Barter[2]	250	256	255	291	4
Mutual security (AID)	19	—	—	—	—
TOTAL CONCESSIONAL	30	30	12	86	1
	1 268	1 051	1 033	1 057	14
COMMERCIAL					
CCC credit sales	218	145	301	369	5
Export-Import Bank credit sales[3]	82	43	84	94	1
Barter[4]	273	340	587	935	12
Other	4 655	4 357	5 254	5 240	68
TOTAL COMMERCIAL	5 228	4 885	6 226	6 638	86
Total agricultural exports	6 496	5 936	7 259	7 695	100

[1]Data from United States national sources. Because of differences in definition of agricultural commodities, these may vary slightly from those contained in FAO series. — [2]Under Public Law 480. — [3]Includes exports under Export-Import Bank loans and medium-term guarantees to commercial banks against political and/or financial risks. — [4]Barter transactions for overseas procurement for United States government agencies.

The volume and value of most of North America's principal imports of crop products were larger in 1971, reflecting strong consumer demand. Coffee, cocoa and tea imports were up by 10, 12 and 24 percent respectively. The combined value of these imports ($1 719 million), however, was only slightly higher as prices for coffee and cocoa averaged lower. Although the volume of sugar imports (5.7 million tons) showed no change, the value ($963 million) was 6 percent higher. Imports of fruit (mainly bananas) increased by 4 percent in volume and 7 percent in value. Imports of vegetable oils and oilseeds (mostly tropical varieties) were up by 5 percent in both volume and value. Tobacco imports were also larger in volume and value.

Most of the region's principal imports of animal products were smaller than in 1970. Total meat imports were down by 6 percent in volume and the value ($1 149 million) was also slightly lower. Beef and veal imports (565 000 tons) were 4 percent smaller in volume but their value ($741 million) was 2 percent higher. Purchases of mutton and lamb were much lower. Canned meat imports were down slightly in value and by 7 percent in volume. Imports of dairy products (of which more than 90 percent was cheese) were lower by 13 percent in volume and 5 percent in value. Wool imports were sharply lower in both volume and value.

The value of United States imports of agricultural commodities reached a record level in 1971. However, the increase was only about 1 percent, compared with 14 percent in 1970. Purchases of commodities to supplement commercially produced domestic supplies accounted for all the 1971 increase, and the value of complementary imports (commodities not commercially produced in the United States) was very slightly lower. The supplementary imports, which accounted for less than 40 percent of total United States agricultural imports in 1955, accounted for almost 65 percent in 1971. Other developed countries have supplied roughly half these supplementary imports in recent years, largely meat and meat products (29 percent) and sugar (21 percent).

The volume of meat imported into the United States under the Meat Import Act of 1964 (fresh, chilled and frozen beef, veal, mutton and goat) was lower in 1971 by about 3 percent, as a result of reduced shipments from Australia, the major supplier. Retail meat prices, particularly for beef which constitutes a large part of these imports, rose sharply in late 1971 and early 1972. Meat import quotas have again been suspended for 1972 and the voluntary restraint level negotiated for imports of these meats during 1972 (562 500 tons) exceeds 1971 imports by about 9 percent.

Agricultural prices and farm incomes

In Canada, the general level of prices received for farm products was again lower in 1971, while that of prices paid continued to rise. The lower level of prices received was accounted for almost entirely by lower prices for field crops. Prices for livestock and livestock products, which had moved downward in 1970, reversed and moved upward in 1971.

The general level of prices received and paid by farmers was higher in the United States for 1971; the increase in the index of prices paid was, however, about two and a half times as great as that in the index of prices received. In contrast to the situation in Canada, the United States index of prices received for field crops was higher in 1971 (by 8 percent), largely as a result of the relatively high level of feedgrain prices that prevailed until supplies were replenished from the 1971 harvest. Prices for livestock and livestock products in the United States, which had also moved downward in 1970, reversed and rose during 1971.

TABLE 2-23. – NORTH AMERICA: ESTIMATED FARM INCOME

	Canada			United States		
	1969	1970	1971	1969	1970	1971
	Thousand million Can. dollars			*Thousand million U.S. dollars*		
Cash receipts from farm marketings	4.2	4.2	4.3	48.1	49.2	51.6
Government payments				3.8	3.7	3.2
Income in kind	0.5	0.5	0.5	3.6	3.6	3.8
Net change in farm inventories	+0.3	+[1]	+0.3	+0.1	+0.2	+0.6
GROSS FARM INCOME	5.0	4.7	5.2	55.6	56.8	59.2
Production expenses	3.4	3.5	3.7	38.7	40.9	42.9
NET FARM INCOME	1.6	1.2	1.5	16.9	15.9	16.3
REALIZED NET FARM INCOME	1.3	1.2	1.2	16.8	15.7	15.7

[1] Less than $50 million.

In both Canada and the United States, increases in aggregate gross farm income in 1971 were largely offset by increased production expenses (see Table 2-23). Nevertheless, 1971 net farm income, although below the 1969 level, was higher than in 1970. The increase in net farm income was, however, absorbed by higher levels of farm inventories, and realized net farm income in both countries was approximately the same as in 1970. As the number of farms continued to decline, realized net farm income per farm averaged slightly above the 1970 level. The lower level of government payments in the United States resulted mainly from reduced payments under the feedgrain programme.

In both countries, income from nonfarm sources has become more important, particularly on small farms. In the United States, almost half of the total income of farm families is derived from nonfarm sources; in 1970, it is estimated that families operating farms with market sales of less than $2 500 (40 percent of United States farm families) derived only 12 percent of their total income from farm operations. Although comparable estimates are not available for Canada, information suggests that income from nonfarm sources amounts to at least one third of the total income of the Canadian farm population.

Problems, policies and programmes

CANADIAN FARM PRODUCTS MARKETING AGENCIES ACT

The Farm Products Marketing Agencies Act, which had been under consideration in Canada for almost two years, was enacted in January 1972. Under Canada's federal system, it has been clearly established that the Parliament has jurisdiction over the marketing of farm products in international and interprovincial trade, and the provincial legislatures over the marketing of local produce within the province; the federal Agricultural Products Marketing Act of 1949 was enacted to delegate federal powers to provincial marketing boards. The issue remains unresolved, however, as to whether provinces may also regulate the internal distribution of farm products originating from outside their province.

The new Act enables the formation of national marketing agencies for individual farm products and provides for delegation to these agencies of federal powers with respect to the marketing of farm products in interprovincial and export trade and, by provincial legislation, of provincial powers with respect to intraprovincial marketing of the product. The Act also creates a National Farm Products Marketing Council to advise the Minister of Agriculture on all matters relating to the formation and operation of agencies established under the Act, to review the operations of the agencies, and to advise and consult with them in promoting more effective marketing of farm products in interprovincial and export trade. Prior to establishment of any agency, the council is required to hold public hearings to determine the merits, or otherwise, of such action.

UNITED STATES SUGAR ACT AMENDMENTS OF 1971

Legislation to amend the United States Sugar Act of 1948 and to extend it for another three years (to 31 December 1974) was completed in October 1971. Market growth continues to be allocated at 65 percent to domestic production and 35 percent to imports. The Amendments provide a more explicit definition of the price objectives of the United States sugar programme and of the conditions under which the annual requirement for domestic consumption is to be adjusted. They also modify the allocation of the basic quotas.

The basic quota for domestic producing areas was increased by 8 percent (to 6 910 000 short tons, raw value); that for mainland cane-producing areas (in the states of Florida and Louisiana) by 40 percent (to 1 539 000 short tons, raw value) and that for domestic beet-producing areas (mostly on irrigated land west of the Mississippi river) by 13 percent (to 3 406 000 short tons, raw value). The quota for Hawaii remains unchanged at 1 110 000 short tons, raw value, Puerto Rico's was reduced by 25 percent (to 855 000 short tons, raw value), and that for the Virgin Islands cancelled. Sugar supplies from Puerto Rico have continued to decline during recent years and actually averaged only 365 000 short tons, raw value, in 1969 and 1970.

Sugar production in the Virgin Islands ceased in 1967.

The main change in the allocation of the aggregate import quota among foreign sources was the reduction of the share allocated to Cuba (from 50 to 23.74 percent), and the distribution of the difference to other foreign suppliers. The 1971 Amendments allocate 61.27 percent of the total import quota to Latin American and Caribbean countries other than Cuba, as compared to 40.52 percent under the previous legislation. The corresponding share for countries outside the western hemisphere was raised from 9.48 to 14.99 percent. The provision for withholding the Cuban quota during the current period of suspension of diplomatic relations between the United States and Cuba and for prorating it among the other foreign sources with import quotas, however, remains generally unchanged.

United States Domestic International Sales Corporations

As a part of the Government's effort to increase exports, the United States Revenue Act of 1971 provides special tax advantages for a new category of corporations, the Domestic International Sales Corporations (DISCs). Although DISCs are not limited to handling agricultural commodities, they may become an important element in the vigorous United States agricultural export expansion effort (see below). Tax advantages provided for DISCs are similar to those available to a foreign subsidiary of a United States corporation, and many United States corporations may, with this option, prefer to establish a DISC, rather than a foreign subsidiary, to handle their export sales operations.

Wheat production and stocks

The 1971 harvest halted the important reduction in North American wheat stocks that had occurred during the 1970/71 season (Table 2-24). There was also a notable shift in the location of these stocks, from Canada to the United States.

In Canada, the 1971 area was sharply higher than that of 1970 when the special LIFT programme was in effect. It was nevertheless slightly below the Government's indicated goal of 8.1 million hectares and notably below the 1967-69 average of 11.4 million hectares. Canadian exports during 1971/72 were again larger and, consequently, the Canadian carryover further reduced. In the United States, the 1971 wheat harvest set a new record; area was 10 percent above the 1970 level and average yields again set a record high. However, United States exports during 1971/72 fell short of the 1970/71 level (in part because of prolonged dock strikes) and the United States carryover rose to a high level.

TABLE 2-24. – NORTH AMERICA: SUPPLY AND UTILIZATION OF WHEAT [1]

	Canada			United States		
	1969/70	1970/71	1971/72[2]	1969/70	1970/71	1971/72[2]
	Million metric tons					
Beginning stocks	23.2	27.5	20.2	22.3	24.1	19.9
Production	18.6	9.0	14.4	39.7	37.3	44.6
Domestic use	4.9	4.4	4.9	21.4	21.4	23.8
Exports[3]	9.4	11.9	13.7	16.5	20.1	17.2
Ending stocks	27.5	20.2	16.0	24.1	19.9	23.5

[1] August-July season for Canada; July-June season for the United States. – [2] Preliminary estimates. – [3] Includes wheat equivalent of wheat flour exports.

In the United States, the 1971 national domestic wheat allotment (the area needed to produce the wheat required for domestic food use) was set at 7.97 million hectares, the minimum permitted under the Agricultural Act of 1970.[3] Producers participating in the Government's 1971 wheat programme were required to set aside the equivalent of 75 percent of their individual shares of this national allotment and, in return, received marketing certificates at the rate of $1.63 per bushel for their proportionate share of the total domestic requirement for food use (14.6 million metric tons). The value of the marketing certificates issued for the 1971 harvest totaled $877 million, equivalent to 40 percent of the total farm market value of that harvest.

With the large prospective carryover, the United States government wheat programme for the 1972 harvest was designed to reduce the area, at least to the 1970 level, which was one of the smallest since the second world war. In the programme announced in July 1971, the national domestic wheat allotment was again set at the minimum level. Participating producers were required, however, to increase their set-asides to the equivalent of 83 percent of their farm domestic wheat allotments in order to obtain a diversion of 6.1 million hectares, the maximum provided for in the 1970 Act. In January 1972, when reports showed that the area already seeded to winter wheat plus that intended to be seeded to spring wheat exceeded the 1971 level by 4 percent, the Government invited participating producers to set aside, voluntarily, up to the equivalent of an additional 75 percent of their farm domestic wheat allotments from the remaining area of their holding. Payments were offered at the rate of 94 cents per bushel for the " established yield" from the area that was set aside voluntarily. The aim of this additional

[3] See *The state of food and agriculture 1971*, p. 65.

offer was to secure the set-aside of an additional 2 to 2.5 million hectares.

A further reduction in Canadian wheat stocks is wanted during the 1972/73 season. The Government therefore indicated a desirable 1972 wheat area in the Prairie Provinces of not more than 7.7 million hectares, approximately the area actually planted in 1971. The minimum price guaranteed to Canadian producers for wheat marketed for domestic human consumption was raised from $1.95 to $3 per bushel for the 1972/73 season. The difference between the old and new guaranteed prices is to be paid by the Government directly to producers, with no increase in the cost of wheat to domestic millers.

Feedgrain supplies and programmes

Larger areas, with generally favourable growing conditions and little blight damage to United States maize, resulted in a record North American feedgrain harvest in 1971. Although the carryover from the previous season was low, mainly because of the small United States maize crop in 1970, total North American feedgrain supplies for the 1971/72 season were at a record level. As a consequence, prices dropped early in the season, creating more favourable livestock/feed ratios and encouraging more liberal feeding. Despite increased domestic use and continued relatively strong export demand, the carryover into the 1972/73 season will be very large (Table 2-25).

The North American feedgrain situation is largely dominated by United States maize, which usually accounts for around 65 percent of the region's total feedgrain production. The record 1971 United States maize harvest was not only a third larger than the small 1970 crop but a sixth larger than the previous record harvest of 1967. In order to replenish stocks, the Government's 1971 feedgrain programme had been of a less restrictive nature and the maize area was 12 percent bigger than in 1970 and the largest since 1960. With little blight damage and generally favourable growing conditions, the national average yield jumped to a record 87 bushels per acre and the resulting production greatly exceeded requirements. The 1971 harvests of grain sorghum and barley in the United States also reached record levels.

Table 2-25. – North America: Supply and utilization of feedgrains [1]

	Canada [2]			United States [3]		
	1969/70	1970/71	1971/72 [4]	1969/70	1970/71	1971/72 [4]
	Million metric tons					
Beginning stocks	6.7	6.9	5.5	45.7	44.5	30.7
Production	18.0	19.9	24.2	159.2	144.9	187.5
Imports	0.6	0.3	0.2	0.3	0.3	0.4
Domestic use	16.4	17.3	17.5	141.5	140.1	149.1
Exports	2.0	4.3	4.7	19.2	18.9	23.3
Ending stocks	6.9	5.5	7.7	44.5	30.7	46.2

[1] Rye, barley, oats, maize (for the United States maize for grain only), mixed grains, sorghum and millet. – [2] August/July seasons. – [3] July/June seasons, except for maize and sorghum which are October/September. – [4] Preliminary.

In Canada, feedgrain production has risen notably during recent years, by about 10 percent in 1970 and 25 percent in 1971. The increase has resulted largely from expanded areas of barley and maize. The expansion of the barley area has occurred mainly in the Prairie Provinces, where the wheat area has been reduced. It reflects recent changes in Canadian grain policies and is indicative of the possibilities in the Prairie Provinces for adjustment of grain production to market conditions. The expansion of the maize area is the continuation of a longer term trend in eastern Canada, particularly in Ontario.

Despite the relatively small 1970 harvest, United States feedgrain exports during the 1970/71 season were only slightly below the level of the preceding season. Exports during 1971/72 are expected only to approximate the 1970/71 level; dock strikes hampered shipments during late 1971 and early 1972, but exports to the U.S.S.R., under the agreement announced in November 1971, are expected to approximate, and perhaps exceed, 3 million tons.

Canada's exports of feedgrains, mostly barley, have risen sharply in both the 1970/71 and 1971/72 seasons. The small United States maize harvest in 1970, and the consequent high level of feedgrain prices generally, contributed to the 1970/71 increase. The further increase in 1971/72, with the record United States maize harvest and significantly lower feedgrain prices, suggests, however, that Canadian barley may have attained a relatively strong competitive position in export markets.

In order to bring production into line with requirements, the United States Government's 1972 feedgrain programme aimed at a diversion of at least 15.4 million hectares from feedgrain production. This is about the same area that was diverted in 1969 and 1970, but more than double that diverted in 1971. To bring about the desired diversion, participants have been required to set aside a minimum of 25 percent of their base acreage (20 percent in 1971); the general level of government payments and other benefits available to participants has been raised; and additional government payments have been offered for the voluntary set-aside of additional acreage. The 1972 programme was announced in November 1971 and, when the 1 Jan-

uary survey of 1972 planting intentions indicated that the feedgrain acreage would again exceed requirements, higher payments and additional options for voluntary set-asides were offered to participants.

Food consumption and prices

With higher levels of personal income and ample supplies available, per caput food consumption is estimated to have again risen slightly in North America during 1971. Per caput consumption of meat increased, with pigmeat accounting for most of the increase. Consumption of cheese and processed fruit, particularly fruit juices, was also higher, while fluid milk and cream, butter and lard continued to decline. Total food expenditures in the United States increased by about 4 percent, and the proportion of disposable personal income spent for food continued to fall, to only 16 percent in 1971 compared with 20 percent in 1960 and 18 percent in 1965.

Retail food prices rose, with the December 1971 index higher than a year earlier by 7.8 percent in Canada and 4.3 percent in the United States. In the latter country prices for fresh fruits and vegetables rose by 17 percent, for beef and veal by 8 percent and for fish by 7 percent, but were lower for eggs by 8 percent. In both countries the increase in retail prices for food items averaged significantly higher than for nonfood items.

The increase in the United States was presumably less as a result of the price freeze in effect from mid-August to mid-November. Although raw agricultural products, including sea foods, were exempt from the freeze, food processors were not permitted to pass increases on to consumers. During the period of the freeze, prices of several food products declined because of seasonally large supplies. In December, however, after the freeze was replaced by more relaxed controls, food prices in grocery stores shot up by almost 1 percent. Although the increase was in part due to lower pigmeat production during November and December and shorter supplies of fruits and vegetables, the market seemed also to be adjusting to imbalances that had developed during the period of the freeze between retail prices and the cost of raw materials.

Retail food prices in the United States continued to rise in the first quarter of 1972. Meat prices lead, as domestic pork production was almost 10 percent below the level of a year earlier, and that of beef only slightly above. Prices received by farmers for pigs are reported to have risen by 15 to 20 percent from the early December 1971 level, and those for beef cattle by more than 10 percent. Indices showed generally more modest increases in retail meat prices, although larger increases were reported for certain cuts and in particular areas.

Expansion of agricultural exports

Export markets have traditionally provided outlets for an important part of the agricultural commodities produced in North America. In both Canada and the United States, agricultural productive capacity has increased more rapidly than domestic requirements, and both governments have encouraged expansion of exports as an alternative to reduced production. The increase in agricultural exports has, however, been less than proportional to the increase in total commodity exports. In 1962-64, agricultural commodities accounted for 23 and 25 percent respectively of total exports from Canada and the United States; in 1970, these proportions had fallen to 11 percent for Canada and 17 percent for the United States.

Government programmes and measures to expand exports involve important agricultural adjustment policy issues at both national and international levels. Although the economic concept of comparative advantage has long provided the theoretical explanation of the mutual advantages to be gained from international trade, it continues to defy the efforts of empirical analysis to produce noncontroversial quantitative measurements, especially in multi-input and multi-output situations involving a number of national economies. In any case, the influence of comparative advantage on the competitive position of a country's exports of a specific commodity is frequently (and often deliberately) obscured, if not entirely obliterated, by various trade-distorting measures (production subsidies, export subsidies, import restrictions, etc.).[4]

If, however, a country is able to maintain or expand its exports of a given commodity without subsidizing production, restricting imports, or paying export subsidies, it can be generally accepted that the country enjoys a comparative advantage internationally in the production of that commodity. On this basis, Canada would currently appear to have a comparative advantage in the production of wheat,[5] barley, oats, flaxseed and rapeseed, and the United States in the production of soybeans and probably feedgrains.[6] For wheat and cotton production in the United States, however, the situation appears to be less clear. As Johnson[7] notes: "In

[4] *Comparative advantage and U.S. exports and imports of farm products.* Paper No. 72:1, Office of Agricultural Economics Research, University of Chicago, Chicago, Illinois, presented by Prof. D. Gale Johnson to the U.S. National Agricultural Outlook Conference, 23 February 1972, contains a concise and relevant treatment of this subject.

[5] Although the return to growers for wheat used for domestic food is higher than international market prices, only a small part of Canada's wheat is actually used for this purpose: for at least two thirds of their total wheat output, Canadian farmers produce in response to international prices.

[6] Large payments are made by the Government to producers under the feedgrain programmes; however, a large part of all feedgrains have, during recent years, been grown on farms not participating in the feedgrain programmes or consisted of feedgrains not included in these programmes.

[7] *Op. cit.*

1970, 36 percent of the cash receipts associated with wheat production was derived from government payments; in the case of cotton, payments constituted 42 percent of the total. And when one adds the possible, but unknown, effects of Public Law 480 shipments it is even more questionable whether the United States has retained the comparative advantage in these two products that was so clear three decades ago."[8] Similar doubts concerning the present comparative advantage of the United States in wheat and cotton production were reflected in the report of the Williams Commission.[9] Neither Canada nor the United States appear currently to have a comparative advantage internationally in the production of dairy products: both governments apply import restrictions, support domestic prices generally above international market levels and frequently subsidize exports.

In Canada, the Government's export expansion efforts have tended to be concentrated on wheat and other grains and oilseeds from the Prairie Provinces, commodities for which Canada appears to have a comparative advantage internationally. All exports of wheat, barley and oats from these provinces are made by the Canadian Wheat Board (CWB), either through exporters acting as its agents or by direct agreements with foreign importers. Sales to centrally planned economies are usually negotiated by CWB and have frequently involved deliveries over an extended period. Export sales are made at competitive international market prices and CWB is authorized to extend export credits for three years or less under a Canadian Government guarantee against default. Export sales of Canadian grains may also qualify for credits, insurance against nonpayment by foreign buyers, and other financial facilities available from the Export Development Corporation. In January 1972, the Government announced allocation of $10 million for expansion and intensification of its export promotion and market development activities for grains and oilseeds from the Prairie Provinces.

In addition to commercial sales, Canada also exports significant volumes of agricultural products as food aid on a bilateral or multilateral basis; total food aid shipments increased from $12.6 million in the fiscal year 1961/62 to $99.6 million in 1970/71.

For the United States, the Secretary of Agriculture has summarized the Government's present objective: "We seek to expand United States farm exports to the maximum — to assure United States agriculture a full share of world market growth."[10] According to the Secretary, United States Government initiatives "to maintain and expand the United States farmers' overseas markets" are to be pursued at both domestic and international levels. At the domestic level, efforts are to be continued to develop market-oriented farm programmes,[11] exports are to be encouraged by new tax incentives,[12] and action is to be taken to keep United States ports from being closed by labour disputes. At the international level, efforts will be made to expand trade with eastern Europe and the U.S.S.R., to work toward normal trade relations with China, to work out better trade relations with EEC, and to eliminate "unfair exchange rates."

These initiatives will presumably be in addition to programmes and measures presently in effect to expand exports of United States farm products; concessional export programmes,[13] export credits from the Commodity Credit Corporation (CCC) and the Export-Import Bank, overseas procurement barter operations for United States government agencies,[14] export subsidies,[15] and government-sponsored special export promotion and market development missions and exhibitions. The total of concessional exports has declined rather steadily from the 1963-65 average of $1 500 million to about $1 000 million in 1971, and sales for foreign currency have been phased out.

Structure and organization of agricultural sectors

Adjustment problems are similar in Canada and the United States. Productive capacity exceeds market demand for agricultural products in both countries. An impressive exodus of labour continues to be more than offset by advances in technology and new capital to enable its more widespread use. Average returns to labour, management and capital (in-

[8] Johnson continues: "I do not want to be interpreted as saying that we have lost our comparative advantage: what I am saying is that our ability to export significant fractions of their output is not convincing evidence that we have maintained their comparative advantage."

[9] *United States international economic policy in an interdependent world. Report to the President submitted by the Commission on International Trade and Investment Policy*. Washington, D.C., 1971.

[10] Secretary of Agriculture Earl L. Butz at the annual meeting of the National Council of Farmer Cooperatives, Phoenix, Arizona, 12 January 1972. Press release from the Office of the Secretary.

[11] Transition to market-oriented programmes was a prominent feature during the past decade in the evolution of United States agricultural commodity programmes, particularly those for wheat, feedgrains and cotton (see *The state of food and agriculture 1971*, p. 65).

[12] See p. 58 for the preferential tax treatment accorded DISCs by the U.S. Revenue Act of 1971.

[13] These are usually reported as exports "under specified Government programmes" and include exports under Public Law 480 (sales for foreign currency, long-term dollar and convertible foreign currency credit sales, government-to-government donations for disaster relief and economic development, donations through voluntary relief agencies, and barter for strategic materials) and under Mutual Security (AID) legislation (sales for foreign currency, economic aid, and expenditures under development loans).

[14] For these transactions, a payment of between 1 and 2 percent is made to the barter contractors as an inducement to participate in the programme and they are eligible to obtain credit, at generally favourable rates, from CCC equal to the value of the commodities that are exported.

[15] These include both government payments to exporters in cash, and differentials on sales for export from government-owned stocks at less than domestic prices.

cluding farm real estate) generally continue below those in the rest of the economy. Restrictions imposed by government programmes on production or marketing increase unit costs of production to the extent that resources in the agricultural sectors are withheld from productive use.

Further adjustments are clearly needed in resource allocation and in the quantities used in agriculture. Opportunity costs[16] of farm labour appear to be significant, although those for much of the farm land are relatively unimportant, since alternative uses are frequently quite limited. For capital invested in farm land (roughly 75 percent of the total investment in the United States agricultural sector), opportunity costs are, however, of major proportions. In any event, the continued rise in farm land values adds to the basic adjustment problems making it more difficult for the governments to devise and apply rational policies and measures.[17]

In both countries, production has become increasingly specialized and concentrated on larger farms, which are generally more viable economic units. As a minimum for viability in the province of Ontario, the Special Committee on Farm Income[18] chose an annual labour return of $4 500 per full-time worker (2 500 hours at $1.80), a return on investment capital of 7 percent and a return to management of $1 000 per year. On this basis, the Committee found that for six major types of Ontario farms the value of production would need to average $42 000 (ranging from $26 000 for beef farms to $90 000 for egg farms) and the capital investments to average $102 000 (ranging from $78 000 for conventional pig farms to $136 000 for cash grain farms).

In the United States, farms with annual sales of $20 000 and over rose from about 450 000 (13 percent) in 1965 to about 600 000 (21 percent) in 1970. In projections for 1980, farms of this size account for 30 percent of the total, have 77 percent (average $439 000 per farm) of total farm production assets, account for 88 percent of total cash receipts from farm marketings and for about 75 percent of total net farm income.[19]

This trend toward even larger farms is caused by several factors. Improved technologies often require machinery and equipment that can be utilized efficiently only by large units. Farm labour has tended to be replaced by machinery, equipment and other purchased inputs. The level of personal income acceptable to farm operators and their families has risen. The structure of market prices has encouraged specialization in the production of more highly standardized types and qualities to meet the requirements of food, feed and processing industries. Benefits from government agricultural price support measures and volume-based subsidies and payments have accrued mainly to operators of farms of this scale. Large-scale farms also acquire advantages in their buying and selling operations, are able to exercise greater financial leverage and to reduce their income tax costs.[20] As might be expected, these larger farms tend to be located in areas with more favourable climate, topography, soils, access to processing facilities and other market outlets, etc. Less favoured areas, as a consequence, tend "to be left behind," to lose population, and to deteriorate economically and socially.

In addition to commercial-scale farms, agriculture in Canada and the United States includes a large number of "mini-farms" occupied by small-scale or part-time farmers, retired farmers, rural residents, and so on. These contribute relatively little to total production, and only a small part of the total income of their operators. For example, it is estimated that in 1970 operators of United States farms with annual sales of less than $10 000 (1 814 000, or 62 percent of total farms) obtained 80 percent of their total family income from off-farm sources (nonfarm employment, retirement and investment income, welfare payments, etc.). For most operators in this category the possibility of entering the larger viable farms sector would appear to be precluded by age, lack of managerial and other required skills and experience, physical handicaps, personal choice, and so on. Entry by any appreciable number of them would only add to the excess of production resources already committed to agriculture.

The different problems of small and large farms are recognized, and in Canada and the United States a two-pronged approach to their difficulties consists of: one, programmes and measures to improve technology, to increase efficiency and productivity, to raise the level of per farm incomes, etc., on the larger farms; and two, more broadly based rural area development programmes. The latter include measures to increase nonfarm employment opportunities in rural areas, to assist those no longer

[16] The value of the output that would result from employment of the input in its most productive alternative use.

[17] For elaboration, see Organisation for Economic Co-operation and Development. *Capital and investment in agriculture*. Paris, 1970: M. Clawson. *Policy directions for U.S. agriculture*. Baltimore, Md, Johns Hopkins Press. 1968: *et al.*

[18] Ontario. Special Committee on Farm Income. *The challenge of abundance...* [Quebec] Southam Murray. 1969.

[19] Although a comparably detailed series of estimates is not available for Canada, census data show that farms in Canada with annual sales of $10 000 and over rose from 10 percent (49 000 farms) in 1961 to 22 percent (95 000 farms) in 1966, and that these farms accounted for 45 percent of total cash receipts from farm marketings in 1961 and for 65 percent in 1966; it has been projected that farms of this size will, in 1980, account for 60 percent (189 000) of total Canadian farms.

[20] U.S. Department of Agriculture. *Midwestern corn farms: economic status and the potential for large and family-sized units*. Washington, D.C., 1971. AER-216. This analysis of 500-acre and 5 000-acre farms found those of 5 000-acres able to obtain 20 percent greater discounts on purchased inputs and an advantage in selling of 5 cents per bushel. The study concluded that the buying and selling advantages contributed more to the higher net return per acre of the 5 000-acre farms than did their internal economies of scale in production operations.

needed in agriculture to take advantage of these opportunities, to narrow existing disparities between rural and urban areas with respect to per caput incomes, housing standards, educational attainment, access to medical and other services, welfare programmes, etc.

In Canada, a Department of Regional Economic Expansion was established in 1969 to bring together existing agencies and programmes concerned with regional development, including those operating in rural areas.[21] The department has authority to prepare and implement, in cooperation with the provincial governments and other federal agencies, development plans and programmes to meet the special needs of areas where the growth of employment and incomes lags behind other parts of the country. Its activities include a programme of incentives to encourage manufacturing and processing industries to establish, expand or modernize in parts of the country where new jobs are badly needed. It also operates a "special area" programme designed to assist the provincial governments in building up the essential infrastructure (utilities and services that industry requires, as well as a wide variety of social facilities to meet the needs of a growing population) in selected growth centres; federal-provincial agreements signed under this programme have committed the department to provide a total of up to $230 million in grants and loans (in addition to federal funds provided as industrial incentives) in the period ending 30 June 1972.

In the United States, the President has requested legislation to establish a new Department of Community Development with responsibility for federal government programmes for community development in both rural and urban areas. This new department would take over most of the functions now performed by the Department of Housing and Urban Development and some functions of other agencies. It would also take over many of the present Department of Agriculture rural development functions. The Department of Agriculture would remain as a separate department to focus on the needs of farmers, presumably those with commercial-scale operations. Pending enactment of the requested legislation, additional funds have been requested for most of the Department of Agriculture's rural development programmes; funds for these programmes during the fiscal year 1972 amounted to $2 800 million, double the figure for 1969.

[21] These include the Agricultural and Rural Development Act, a federal-provincial shared-cost programme in which all provinces have participated since its introduction in 1962; the Fund for Rural Economic Development, a federal fund of $300 million established in 1966 to finance comprehensive federal-provincial development plans in selected areas; and the Prairie Farm Rehabilitation Administration, created in 1935 to carry out a variety of land improvement and other development works in the Prairie Provinces.

Problems and issues in the United States dairy industry

Rapid and important changes have taken place in the organization of the United States dairy industry recently, especially for the pricing of dairy products. It has been suggested that the "competitive situation and pricing system of the United States dairy industry in 1980, compared with 1971, will be unrecognizable in several respects." [22] Continued changes in market structure, consumer demand and processing, and shifts in the distribution of market power, are likely to create new problems.

Milk production has become increasingly concentrated on larger and more highly specialized farms. It is expected that these trends will continue and that a high proportion of the smaller producers of milk for manufacturing purposes will discontinue their dairy farming. Herds of less than 50 cows will virtually disappear and the modal size may well become several hundred cows. Vertical integration by handlers and processors is also a possibility that could bring even more drastic changes in the structure and organization of milk production.

Isolation among individual fluid-milk markets has been largely removed by technological developments in transportation and processing methods that make it possible to move milk (both in bulk and packaged forms) over much greater distances. Whereas fluid-milk markets 50 to 65 kilometres apart were once separate and distinct, bulk milk now moves as far as 3 000 kilometres and packaged milk 300 to 400 kilometres. An initial effect of these developments was frequently to increase competition between cooperatives in what had formerly been separate markets. During the 1960s the emphasis shifted, however, first to joint efforts by cooperatives through federation and, later, to merger of cooperatives into large regional groups. There are currently eight federations of cooperatives, formed early in the 1960s, representing 126 000 producers and controlling about 52 000 million pounds (23 600 million kilogrammes) of milk, about 44 percent of the national milk supply. Since 1967, six large producer-organizations have been formed as a result of mergers or consolidations of existing cooperatives with about 73 000 producer-members and an annual volume of about 26 000 million pounds (11 800 million kilogrammes) of milk, about 22 percent of the national milk supply.

The handling and processing of milk have also become increasingly concentrated in fewer but larger plants. Technological considerations and economies of scale have been important factors contributing to this trend. However, a major change

[22] U.S. Department of Agriculture, *Pricing milk and dairy products*, Washington, D.C., Economic Research Service, 1971, AER-207.

during recent decades in the retail distribution of packaged milk has been the decline in home deliveries, from about 50 percent of total sales in 1950 to 20 percent in 1970. An important factor in this decline has been the rise of retail chains and supermarkets, which now account for about one third of total packaged milk sales. However, the impact of supermarkets has been much greater than their share of the market might suggest, as they have tended to set the pace of competition and pricing in the packaged milk trade. In some cities they have also integrated into handling and processing. With the continued growth of large regional producer-cooperatives and the dominant position of supermarket groups in the retail distribution of packaged milk, the handlers of fluid milk appear to be losing their bargaining position as they confront large and powerful groups in both their buying and selling operations.

An additional issue relates to the relative values to be attached, in government price policies and programmes, to the various components of raw milk (particularly of butterfat and of nonfat solids) and to the major manufactured products (particularly butter, cheese, dry skim milk, and dry whey). Until the second world war, the market value of milk was attributed almost entirely on its butterfat content. With the development of milk-drying technologies during and since the second world war and with greater awareness of the nutritional value of the nonfat solids, these have increasingly acquired value. The pricing of raw fluid milk, for both fluid milk and manufacturing purposes continues, however, to be based almost entirely on butterfat content.[23]

[23] In recent years, plans assigning specific value to nonfat solids or protein have been adopted by the State of California and by a few cooperatives in other areas.

Oceania

Oceania's agricultural production in 1971 was 3 percent higher than in 1970. Additional crop production accounted for most of the increase. The region's foreign trade in agricultural commodities also increased. Both exports and imports were larger in volume and higher in value. Australia's wheat stocks were significantly smaller at the end of the 1971/72 season. The region's wool stocks were also sharply reduced as export demand strengthened and, during early 1972, prices rose above the support levels.

The Australian economy remained sluggish throughout 1971. Gross national product at current prices is estimated to have increased by about 10 percent, but at constant prices by only 3 percent. Costs and prices rose quite rapidly. Wages and salaries increased by about 15 percent between the third quarters of 1970 and 1971, while the annual rate of increase in consumer prices accelerated from about 5 percent in the first quarter to 7 percent in the last. Unemployment increased and stood at 2.2 percent in December. Exports, with additional growth in minerals and manufactures, again outpaced imports and the trade deficit was sharply reduced. With a high level of capital inflow, Australia's international liquidity reserves almost doubled during 1971.

The New Zealand economy was also slow-paced in 1971. Gross national product rose by about 16 percent at current prices, but by only 4 percent at constant prices. Consumer prices went up by about 10 percent. Investment stagnated, and unemployment increased. For the year ending March 1972, the national wage and salary bill is estimated to have been about 43 percent higher than for the comparable period two years earlier. Despite low wool prices, exports were higher and a large inflow of capital, including credit financing for major imports, brought New Zealand's international liquidity reserves to a record level at the end of 1971.

Agricultural production

Agricultural production in Oceania increased by about 3 percent in 1971 (Table 2-26). Additional crop production accounted for most of this increase. Production of cereals, except sorghum and oats, was higher than in 1970. The Australian wheat harvest was up by 10 percent as the result of an increase in area; the 1971 harvest was, however, about 6.1 million metric tons (41 percent) lower than the 1968 record. Australian production of feedgrains was also above the 1970 level; barley production was larger by a third, which more than offset decreases in oats and sorghum, and maize production continued to increase. In New Zealand, wheat and barley production recovered from the drought-stricken levels of 1970 and that of maize continued to rise. Rice production in Australia continued upward, and sugar production was also higher, by 10 percent, and slightly larger than the previous

TABLE 2-26. – OCEANIA: INDICES OF FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971[1]	Change 1970 to 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	..... *1961-65 average = 100*					*Percent*	..... *1961-65 average = 100*					*Percent*
FOOD PRODUCTION												
Australia	105	132	122	123	130	+ 6	97	120	110	108	112	+ 3
New Zealand	112	118	124	119	122	+ 3	104	109	113	107	108	+ 1
REGIONAL	106	128	123	122	128	+ 5	99	117	110	108	111	+ 3
AGRICULTURAL PRODUCTION												
Australia	104	126	122	121	125	+ 3	97	115	109	106	108	+ 1
New Zealand	113	117	120	118	120	+ 1	104	108	110	106	106	—
REGIONAL	106	124	122	120	124	+ 3	99	113	109	106	107	+ 1

[1]Preliminary.

record harvest of 1968. Cotton production in Australia, however, was lower and that of tobacco showed little change. Australian oilseed production was significantly higher, as rapid expansion of the area under rapeseed and sunflowerseed continued. Vegetable production was higher in both countries, but that of fruit lower than in 1970.

The relatively small increase in livestock production in Oceania resulted from continued upward trends in meat production in Australia, where production of all the major categories of meat (beef and veal, mutton and lamb, pork and poultry meat) reached new record levels. In New Zealand, total meat production approximated the 1970 level as a very small increase in beef and veal production fell short of the relatively strong upward trend of recent years; pork production rose to the level of the mid-1960s while mutton and lamb production was slightly below the level of the three preceding years. In both countries the wool clip approximated the level of the preceding season. Milk production was again lower in Australia.

Trade in agricultural products

The region's foreign agricultural trade increased in 1971. The volume index of agricultural exports was slightly higher and the value was 7 percent greater than in 1970 (Table 2-27). Exports of almost all of the major commodities, with the notable exception of wool, were significantly larger in terms of both volume and value. Agricultural imports also increased, by 2.5 percent in volume and 4.3 percent in value.

Australia's grain exports set new records in 1971. Wheat exports reached 8.8 million tons (13 percent above 1970 and 9 percent above the previous record level of 1967) with a value of U.S.$558 million ($150 million more than in 1970). Exports of feedgrains (barley, oats and grain sorghum) jumped in 1971 to 2.5 million tons, more than double the 1970 total and almost triple that in 1969. With prices also higher, the value of 1971 feedgrain exports amounted to $128 million, compared with only $44 million in each of the two preceding years. Sugar exports from Australia also increased in 1971, by 8 percent in volume and 14 percent in value. Shipments of apples and oranges were larger, while those of raisins declined.

Meat exports from both Australia and New Zealand continued to increase in volume and value. For beef and veal, however, the volume was only 4 percent higher (compared with 16 percent in 1970) because of the very small increase in shipments from New Zealand, although with higher prices the value of the region's exports (U.S.$595 million) was 14 percent above 1970. Mutton and lamb exports were up 15 percent in volume, following a small reduction in 1970, but prices averaged slightly lower. Because of smaller shipments from Australia the region's exports of butter were 11 percent below 1970, but prices were higher and their value ($220 million) increased by 21 percent. Cheese exports were up 9 percent, with larger shipments from New Zealand; prices were also higher and the value was 31 percent above 1970. Although the volume of dry milk exports was slightly smaller in 1971, average prices increased sharply and the value ($83 million) was 42 percent greater than in 1970.

TABLE 2-27. – OCEANIA: INDICES OF VALUE OF EXPORTS OF AGRICULTURAL PRODUCTS

	Share of total agricultural exports in 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	Percent	..... *1957-59 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	144	122	142	152	162	+ 7
Food and feedstuffs	75	185	154	180	205	253	+ 23
Cereals	21	348	202	260	291	425	+ 46
Sugar	7	162	183	180	222	253	+ 14
Meat	30	169	171	218	254	291	+ 15
Dairy products	12	143	109	110	116	146	+ 27
Raw materials	24	105	91	105	100	76	— 24
Wool	24	105	91	105	100	76	— 24

[1]Preliminary.

The volume of Oceania's wool exports during 1971 was 9 percent (103 000 tons) below the record 1970 level. Prices also averaged lower and the value ($817 million) was consequently down by 24 percent.

Agricultural prices and incomes

The index of prices paid by Australian farmers continued its long-term upward trend during 1970/71, rising by about 5 percent; wages, prices paid for services, and overhead items again rose fastest. The index of prices received by farmers averaged lower for the fifth consecutive season. Prices received from export sales again declined sharply, in contrast to prices received from domestic sales which, on average, remained generally unchanged. Wool prices were again down, although export prices for wheat averaged about 5 percent higher and those for dairy products moved upward during the season. In order to moderate the effect of fluctuations in receipts from export sales, the Government has, during recent years, made devaluation compensation payments, and operated wheat stabilization schemes and equalization schemes for butter and cheese. Special measures were extended to wool during 1970/71 (see below). Stabilization plans for apples and pears and for dried vine fruits are reportedly under consideration.

Aggregate farm income in Australia was lower by about $A142 million in 1970/71, as a result of a lower gross value of farm production. Total production costs are estimated to have remained at about the level of the preceding seasons, with the effect of higher prices for inputs offset by a drop in the volume purchased. Subsidies paid for some inputs, especially fertilizers, helped to reduce the increase in aggregate farm costs. Direct subsidies on fertilizers in 1970/71 are estimated at $56.5 million. Average income per farm operator continued its longer term downward trend (begun in 1963/64) and in 1970/71 was about three quarters of the 1963/64 level at current prices, or three fifths at constant prices. Cash receipts of some wool growers were supplemented by payments from the $30 million fund which provides emergency assistance to the wool industry; assistance was limited to a maximum of $1 500 per producer.

The index of prices received by New Zealand farmers averaged slightly higher in 1970/71 as the modest upward trend of recent years continued. However, inflationary pressures caused the level of prices paid by farmers to rise more sharply. Export prices for wool averaged about 7 percent lower but those for meat continued to be generally firm. Export demand for dairy products strengthened notably during the season; the price for butter, which had been unchanged since March 1966, rose by 40 percent and that for cheddar cheese by more than 20 percent.

For the 1970/71 season, gross farm income in New Zealand is estimated to have been again slightly above that for the preceding season. Although higher prices for inputs were partly offset by the lower quantity purchased, production costs were appreciably higher and net farm income consequently lower. It has been estimated that the net income of sheep farms averaged 10 percent less while that of dairy farms probably showed little change from the 1969/70 level. To ease the financial plight of sheep farmers, the Government announced in October 1971 a supplementary finance scheme to enable interest-free advances of up to $NZ3 000 to be made through their regular sources of seasonal financing.

To encourage them to maintain their flocks, the Government is paying a stock retention subsidy on a graduated scale to farmers with 250 or more sheep; the rate of the subsidy declines from $1 per head for farmers with from 250 to 5 000 sheep to 20 cents per head for those with more than 10 000.

Problems, policies and programmes

WOOL PRODUCTION AND STOCKS

Wool production in both Australia and New Zealand has fluctuated about a relatively stable level during recent seasons. However, export demand has continued to be generally weak and prices to follow a longer term downward trend. The weakening of export demand reflects intense and sharpening competition from synthetic fibres (a long-term influence) and a slowdown of the world textile industry, associated mainly with current lower growth rates in developed market economies — a shorter term effect (Table 2-28).

The wool commissions in both countries support market prices and, at a higher level, growers' returns. Each commission supports market prices by establishing a reserve price at which it stands ready to buy in order to clear the auctions of the quantity offered. Growers receive deficiency payments, in addition to the price obtained from the auction sales, to bring total return per pound to the higher level guaranteed by the respective commissions.

The Australian commission, established in November 1970, began market price support with a fixed average reserve price of 30 cents per pound.

TABLE 2-28. – OCEANIA: WOOL PRODUCTION AND STOCKS

	Australia			New Zealand		
	1969/70	1970/71	1971/72[1]	1969/70	1970/71	1971/72[1]
	..... *Thousand metric tons*					
Beginning stocks (1 July), clean basis						
Wool Commission . .	—	—	27	54	39	30
Other	21	13	19	10	13	12
Production, greasy basis.	923	878	877	328	334	330
Exports, greasy basis . .	754	684		303	294	
Ending stocks (30 June), clean basis						
Wool Commission . .	—	27		39	30	
Other	13	19		13	12	

[1] Preliminary.

It was required to buy actively to support this level and held stocks of 437 000 bales at the end of the 1970/71 season. For the 1971/72 season, growers were guaranteed an average return of 36 cents per pound, with deficiency payments to cover the amount by which auction prices fell short of the guaranteed level. The season opened with prices slightly lower than at the close of the preceding season and the commission's buying operations continued. However, as the season progressed the market strengthened, and during the early part of 1972 prices rose above the commission's support levels.

The New Zealand commission accumulated relatively large stocks of wool as the result of its market price support operations during 1966/67 and 1967/68. As stocks rose, the commission lowered its average reserve price from 25 cents to 16¼ cents per pound in October 1967. Deficiency payments were made to cover the difference between the lower reserve price and the guaranteed minimum return to growers, which remained at 25 cents per pound. The guaranteed return to growers for subsequent seasons was lowered to 22½ cents per pound for 1969/70 and to 21 cents per pound for 1970/71, and the commission shifted to a more flexible reserve price system. The combination of flexible reserve prices with deficiency payments and improvement in demand for crossbred wool enabled the commission to reduce its holdings to 263 000 bales by the end of the 1970/71 season. Demand for New Zealand wool also strengthened during the 1971/72 season and a sharp rise in prices during January 1972 put them above the commission's support levels.

WHEAT PRODUCTION AND STOCKS

Record exports during the 1970/71 season brought a sharp reduction in Australia's wheat stocks (Table 2-29). The delivery quota for the 1971 harvest was raised by about 7 percent. Production rose by a slightly smaller amount, and was below the delivery

TABLE 2-29. – AUSTRALIA: SUPPLY AND UTILIZATION OF WHEAT

	1969/70	1970/71	1971/72[1]
	.... *Million metric tons*		
Beginning stocks (1 December). . .	7.3	7.2	3.4
Production	10.5	7.9	8.6
Domestic use.	2.4	2.7	2.7
Exports[2]	8.2	9.0	8.1
Ending stocks (30 November) . . .	7.2	3.4	1.2

[1]Preliminary. – [2]Includes wheat equivalent of wheat flour.

quota for the second consecutive year. Exports during 1971/72, although below the record level of the preceding season, have been higher than anticipated. End-of-season stocks thus showed a further significant decline. The delivery quota for the 1972 harvest has been raised by about 20 percent, to 11.1 million metric tons, the largest since these quotas were introduced in 1969. Both the prices guaranteed to producers and those charged for domestic sales by the Australian Wheat Board have been increased slightly for the 1971/72 season. As export prices remain below the guaranteed producers' price ($A1.518 per bushel), the difference will again be covered by a government contribution to the Wheat Price Stabilization Fund.

Agricultural adjustment and policy issues

In Australia and New Zealand, agricultural adjustment problems and policy issues relate increasingly to the level of personal incomes realized from farming operations. In both countries these problems have tended to be treated primarily in terms of individual commodities. Since export markets have traditionally provided outlets for an important part of the production of most of their major agricultural commodities, the commodity-oriented policies and measures have also tended to be largely export-oriented. Their objectives have included expansion of the volume of exports of agricultural commodities, diversification of export markets and stabilization of prices received. Commodity marketing boards have played an important role in carrying out these policies. Both governments have been staunch supporters of international commodity agreements and other market organization arrangements.

The pattern described above undoubtedly reflects the historical emphasis in both Australia and New Zealand on production for export, particularly to the United Kingdom. This emphasis has encouraged specialization on individual holdings and the creation of relatively distinct areas of specialized farming which, rather than individual farm units or the agricultural sector as a whole, have been the main object of policy studies. The New Zealand Agricultural Production Council, within the context of the National Development Conference, has in recent years adopted a more sector-oriented approach. Recent programmes to expand production for domestic consumption, of wheat in New Zealand and of cotton in Australia, are indicative of new thinking in this direction.

There appears to have been no important difference between income levels in the farm and non-farm sectors until the mid-1960s in either Australia or New Zealand. This may explain to some extent why the commodity approach remained unchallenged for so long.[24] Land settlement policies had led to large inputs of land in relation to other capital and labour. Thus farmers were generally well placed to increase productivity by additional capital investments incorporating improved technologies (range and pasture improvement, irrigation, fertilizers, machinery, specialized equipment, etc.). Where areas were closely settled such possibilities were more limited and likely to be exhausted sooner, particularly as newer technology often required a larger scale for economic use. Since the mid-1960s, however, incomes in the nonfarm sectors have continued to rise in Australia and New Zealand, while farm incomes have lagged behind. This decline has probably been most acute in the more closely settled areas. In 1969/70, average income per Australian farmer was some 23 percent below the 1963/64 level.

The farm income problem includes not only the drop in aggregate income but also the distribution of incomes within the agricultural sector. The benefits provided by commodity programmes are related to production (so much per bushel or per pound). They may thus add important amounts to the incomes of large farmers but give little to small ones. As in the United States,[25] commodity programmes in Australia and New Zealand have probably widened the dispersion of individual farm incomes. In Australia, about 80 000 farms (one third) had net farm incomes of less than $A2 000 during the early 1960s.[26] At that time, producers with annual incomes of less than $2 000 included 55 percent of the dairy farmers, 41 percent of the apple and pear growers, and 25 percent of the dried vine fruit and sheep producers. At the other extreme, those with incomes of $6 000 and over included 72 percent of the cotton growers, 60 percent of the wheat growers, 57 percent of the beef cattle producers, 43 percent of the sheep farmers, and 34 percent of the producers of deciduous canning fruit.

The Australian Bureau of Agricultural Economics foresees a continued withdrawal of labour (including owner-operators) from the farm sector. Adjustments in farm size will necessarily be associated

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[24] K. Campbell, Rural reconstruction, in *Current Affairs Bulletin*, August 1971, examines this and other reasons why Australian governments "have been rather late to accept adjustment measures, and restructuring in particular, as one facet of *continuing* agricultural policy."

[25] "Unquestionably, commodity programmes widen the dispersion of income within agriculture. It may seem strange to you, but it took us 35 years to find this out." Don Paarlberg, Director of Agricultural Economics, United States Department of Agriculture, speaking at the Trade Policy Research Centre, London, England, 28 February 1972.

[26] D.H. McKay, The small-farm problem in Australia, *Australia Journal of Agricultural Economics*, Vol. 2, No. 2, December 1967. Net farm income is defined as "gross farm returns, less cash costs and allowances for family labour and depreciation. The residual provides the return to the owner operator for his labour and management and also for the capital employed including any funds needed for the servicing of debt."

with this withdrawal.[27] The bureau has emphasized the need for "measures directed at debt reconstruction, farm buildup, rehabilitation and retraining, where appropriate, for farmers who decide to leave their industries, as well as some change in the manner in which credit is provided to the sector." There are, in Australia, two four-year programmes of this sort currently in effect: one of $A25 million devoted specifically to marginal dairy farms and the other of $A100 million for broader rural reconstruction. Expenditures under these two programmes are, however, relatively small compared to the Government's direct support for commodities such as wool, wheat and dairy products.

[27] The Australian farm situation, 1970-71, *Quarterly Review of Agricultural Economics*, Bureau of Agricultural Economics, Canberra, January 1971.

Latin America

Preliminary data suggest that overall growth in the region as a whole in 1971 may have been somewhat lower than in 1970. Most countries in the region, including Argentina, Mexico and Colombia, did not reach expected targets. There were a few exceptions, such as Brazil and Chile. Brazil maintained a very high growth rate for the fourth consecutive year, with a GDP increase of 11.3 percent, again well balanced with agriculture at 11.3 percent, manufacturing nearly equal at 11.2 percent, and total exports up by 12.8 percent. The Chilean economy is also reported to have risen by between 6 and 8 percent compared with below 3 percent in 1970. In Argentina the GDP rose by an estimated 3.8 percent compared with 4.8 percent in 1970. The disappointing economic performance of Mexico was partly the result of fiscal and monetary restraint measures adopted by the Government to soften inflationary pressures and to improve the balance of payments, and the GDP increased by some 4 percent, about half the 7.7 percent achieved in 1970. The reduced growth rate in Colombia — 5.5 to 6 percent after 6.8 percent in 1970 — was mainly caused by a drop in coffee prices and the prolonged wet season which reduced agricultural production.

The share of agriculture in regional GDP declined slowly from 20 percent in 1960 to some 17 percent in 1971. Agriculture in Argentina, Brazil and Mexico (which together account for some 70 percent of the total cultivated land) now contributes some 15, 19 and 13 percent respectively of gross domestic product. In a number of countries, including Colombia, Ecuador and Honduras, agriculture continues to generate more than 30 percent of GDP.

Agricultural production

The considerable gains reported in 1971 for a number of countries, including Bolivia, Brazil, Chile, Costa Rica, El Salvador, Honduras and Nicaragua, hardly offset the reductions, for example in Argentina from the steep fall in cotton and beef output and in Cuba from a major setback in sugar production, and total agricultural production in the region increased by less than 1 percent (see Table 2-30).

With the exception of Panama, where agricultural production increased only slightly, the Central American countries did very well in 1971, and particularly large increases were recorded in El Salvador and Nicaragua. The reduction in agricultural production in the Caribbean reflected the drop in sugar output in Cuba and Barbados. However, agricultural production in the Dominican Republic increased for the third consecutive year and in Jamaica recovered from the slowdown of 1969 and 1970. The South American countries, except Argentina, Ecuador, Paraguay and Uruguay, had increases ranging from 1 percent in Peru to 7 percent in Chile.

Based on the preliminary production data for 1971 the index of per caput output dropped by 3 percent from 1970. This reduction is not only a reflection of the continuing rapid population growth in most countries of the region but also of the important production losses experienced by Argentina and Cuba.

Among the major commodities, wheat production recovered from the preceding year and amounted to 11.4 million tons. This compares with a 1961-65 average of 11.6 million tons. The recovery was mainly due to an 11 percent production rise in Argentina which accounts for almost half of the regional total. However, the increases also reflect a record crop (exceeding 2 million tons) in Brazil, and increases in several smaller producers. The growth of Paraguay's wheat production from the 1961-65 average of 7 000 tons to a level of 47 000 tons in 1971 illustrates the ability of more progressive farmers to move into commercial production when adequate incentives are offered.

The region's output of maize continued to grow and in 1971 reached almost 40 million tons, which represents an increase of 45 percent over the 1961-65

TABLE 2-30. – LATIN AMERICA: INDICES OF FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971
	1961-65 average = 100					Percent	1961-65 average = 100					Percent
Food production												
CENTRAL AMERICA	120	124	129	133	138	+ 3	106	105	106	106	105	—
Costa Rica	126	132	157	171	180	+ 6	109	110	126	132	134	+ 2
El Salvador	115	118	123	135	144	+ 7	102	101	102	108	112	+ 4
Guatemala	115	122	127	131	135	+ 3	102	106	107	107	107	—
Honduras	134	144	143	130	140	+ 7	117	122	117	103	107	+ 4
Mexico	120	122	127	131	135	+ 3	105	104	103	103	103	— 1
Nicaragua	121	127	139	142	149	+ 5	108	110	117	114	116	+ 2
Panama	113	135	146	140	141	+ 1	99	115	120	112	109	— 2
CARIBBEAN	110	103	100	124	111	— 11	101	92	88	106	93	— 13
Barbados	114	95	86	94	86	— 9	109	89	82	94	87	— 8
Cuba	118	109	101	145	118	— 19	108	98	90	125	99	— 21
Dominican Republic	106	101	112	120	126	+ 5	92	85	90	94	95	+ 1
Haiti	110	105	109	110	113	+ 2	101	95	97	96	96	—
Jamaica	100	96	90	89	92	+ 4	91	86	79	76	77	+ 1
SOUTH AMERICA	115	116	122	125	125	—	103	101	104	103	100	— 2
Argentina	116	110	119	115	109	— 5	109	102	109	103	97	— 6
Bolivia	114	124	124	125	130	+ 4	104	110	106	105	106	+ 1
Brazil	117	123	127	133	137	+ 3	104	106	107	108	108	—
Chile	110	115	108	111	119	+ 8	100	102	94	94	99	+ 5
Colombia	113	116	123	130	139	+ 6	100	99	102	105	108	+ 3
Ecuador	113	112	112	117	118	+ 1	99	95	92	93	90	— 3
Guyana	105	105	110	105	110	+ 5	93	90	91	85	86	+ 2
Paraguay	119	117	117	130	131	+ 1	106	100	97	104	102	— 3
Peru	117	110	120	130	132	+ 1	104	94	100	105	103	— 2
Uruguay	83	104	110	116	107	— 8	79	98	102	106	97	— 9
Venezuela	129	135	143	150	154	+ 3	113	114	116	118	117	— 1
REGIONAL	115	117	121	126	126	—	103	101	103	103	100	— 3
Agricultural production												
CENTRAL AMERICA	117	121	122	125	130	+ 4	103	103	101	99	100	—
Costa Rica	128	131	152	162	171	+ 5	110	109	121	125	126	+ 1
El Salvador	105	102	106	116	129	+ 11	93	87	88	93	100	+ 7
Guatemala	115	122	127	128	130	+ 2	103	106	107	105	104	— 1
Honduras	133	144	141	128	136	+ 7	117	122	116	101	105	+ 3
Mexico	117	119	120	123	127	+ 3	102	101	98	97	97	— 1
Nicaragua	129	130	133	127	144	+ 13	115	113	113	103	113	+ 10
Panama	113	134	145	139	141	+ 1	99	114	120	111	108	— 2
CARIBBEAN	109	102	99	121	108	— 10	99	91	87	104	91	— 13
Barbados	114	95	86	94	86	— 9	109	89	82	94	87	— 8
Cuba	117	108	100	142	115	— 19	107	97	88	122	96	— 21
Dominican Republic	103	99	109	116	122	+ 5	89	82	88	90	92	+ 1
Haiti	107	102	105	107	109	+ 2	99	92	93	93	93	—
Jamaica	101	97	92	91	94	+ 4	92	87	80	78	79	+ 1
SOUTH AMERICA	112	113	119	120	121	—	100	98	101	99	97	— 2
Argentina	112	108	117	113	105	— 7	106	100	106	101	93	— 8
Bolivia	114	125	125	127	136	+ 8	104	110	107	106	111	+ 5
Brazil	113	117	123	124	130	+ 5	100	101	103	101	103	+ 2
Chile	110	114	108	111	119	+ 7	100	101	93	94	98	+ 5
Colombia	112	117	122	131	136	+ 4	99	100	101	105	105	—
Ecuador	113	111	111	118	118	—	99	94	91	94	90	— 3
Guyana	105	105	109	105	109	+ 4	93	90	91	85	86	+ 2
Paraguay	116	116	118	128	128	—	102	100	98	103	99	— 4
Peru	110	106	113	122	123	+ 1	98	91	94	98	96	— 2
Uruguay	86	102	106	111	103	— 7	82	96	99	102	94	— 8
Venezuela	128	133	141	148	152	+ 3	112	112	115	116	116	— 1
REGIONAL	113	113	118	121	122	—	101	98	100	99	97	— 3

[1] Preliminary.

average. Major contributors to this record were Brazil, where output again reached 14.2 million tons; Argentina, which benefited from favourable climate and where a 6 percent increase led to the highest maize harvest since 1941 at 9.9 million tons; and Mexico, where a record crop of 9.4 million tons reflected the expansion of maize area by almost 4 percent, compared with a regional increase in area by 2.4 percent in 1971. Excellent maize harvests were also reported for Colombia, where a 19 percent increase resulted mainly from more intensive use of improved seed and better cultivation practices, and for Chile and Uruguay, where production was 8 and 15 percent, respectively, above 1970.

Regional sorghum production amounted to 8.2 million tons, almost 18 percent above the previous harvest, mainly because of a record crop of 4.8 million tons in Argentina.

Regional rice production declined by 8 percent to 10.9 million tons, principally because of a major setback in Brazil. This was caused by a drought in early 1971 affecting the Central Plateau where dryland rice is grown, and by reduced plantings in the state of Rio Grande do Sul where 95 percent of the rice land is irrigated. Total Brazilian production amounted to 6.6 million tons, 12.6 percent below the record crop of the previous season. Other countries, in particular Chile, Ecuador and Guyana, also reported lower yields. In Argentina prices were still under the influence of the bumper harvest of the preceding year, and farmers had reduced plantings by 21 percent.

The slight reduction in the sugarcane harvest was mainly due to another poor season in Cuba, the second producer in the region after Brazil. The area under cane in Cuba was further reduced from the peak of 1.4 million hectares in 1969 to 1.2 million hectares in 1971, and sugar production compared with 1970 decreased by 31 percent to 5.9 million tons. Production in Brazil amounted to 5.5 million tons and in Mexico and Peru it rose to 2.6 million and 877 000 tons respectively. The favourable situation in Argentina and Colombia did not offset the losses reported in Cuba, Barbados and Bolivia, and total regional sugar production at 21.6 million tons was almost 9 percent below the previous season.

Among the starchy roots, cassava stands out with a 1971 production of 36.6 million tons. Brazil, the most important producer, accounts for 86 percent of regional production. Yields have shown no significant increase over the past years, and the growth of output reflects mainly a 33 percent increase in planted area from an average of 1.5 million hectares in the first half of the 1960s to some 2 million hectares at present. As cassava can be produced on relatively poor soils and is fairly drought-resistant it is also an important food item for subsistence farmers in a number of countries, particularly in Bolivia, Brazil, Colombia, Cuba, Ecuador, Haiti, Paraguay, Peru and Venezuela.

Regional production of potatoes, a staple food item in Argentina, Brazil and, particularly, the Andean countries, decreased slightly to 9.1 million tons. Lower yields resulting from adverse weather caused significant losses in a number of countries, including Argentina, the region's largest potato producer, where yields were down 11 percent and output fell by 16 percent to less than 2 million tons. In some regions of Brazil, 1971 potato plantings were adversely affected by untimely rain and hail and subsequently by drought, and production was lower than expected.

For dry beans, another typical domestic food crop in Latin America, 1971 was not a good year and regional production, estimated at 3.7 million tons, was 3 percent below the previous year. A noticeable improvement in yields has taken place however, not so much in Brazil and Mexico (the major producing countries, which account for some 80 percent of regional production and where average yields remained below 700 kilogrammes per hectare) but rather in several Central American countries and in Chile, where national average yields are now above 1 000 kilogrammes per hectare.

Regional banana production is estimated to have expanded by 3.6 percent to 18.3 million tons in 1971. Major gains are reported from Brazil, the biggest producer, where production went up by almost 5 percent in 1971 and reached 6.7 million tons. A large increase was recorded also in Costa Rica, where the 1971 harvest rose to 1 million tons, or 5 percent above the previous year. In Ecuador, the world's largest exporter of bananas, over 50 percent of the estimated area of 190 000 hectares are now planted with the Cavendish variety, compared with less than 40 percent in 1970. The smaller growers of Gros Michel bananas in the north-central regions in Ecuador produce at relatively high cost, and many of them may have to move into other lines of production.

Although the 1971 coffee harvest was lower in a number of countries, including Colombia, Ecuador and Guatemala, where losses amounted to 9, 15 and 12 percent respectively (in Colombia, for example, heavy rainfall was responsible for lower yields) regional output rose by 38 percent because the Brazilian crop increased sharply by 121 percent. However, this was not so much because the 1971 harvest was exceptionally good but rather that the previous one had been a near failure.

Because of a good harvest in Brazil and an 11 percent production increase in Ecuador, the two largest cocoa producers in the area, regional cocoa production reached the record level of 419 000 tons. In both countries government programmes are being

implemented to encourage new planting, renewal of old plantations by replanting with hybrid and clonal varieties, as well as improvement of cultivation techniques and plant protection measures. The 1971 harvest in Ecuador was the second largest ever recorded and output in Brazil has shown an upward trend. In Mexico, production rose to 27 000 tons. In Colombia, it increased by 11 percent to a record 21 000 tons.

Mexico's cotton harvest, slightly better than in 1970, did not offset the significant losses that occurred in the largest producing countries, Brazil and Colombia, which experienced major setbacks of 26 and 13 percent respectively, and the regional cotton output was 12 percent lower than in 1970. Regional production, estimated at 1.4 million tons, is now below the average level of 1.6 million tons of the 1961-65 period, mainly because of the reduction in area planted in the major producing countries.

The production of beef and veal in the region fell by almost 7 percent to 6.5 million tons because output in Argentina, the largest Latin American meat producer, dropped by 26 percent to 2 million tons. Owing to rising inflation in 1971 ranchers held back marketing in anticipation of further increases in cattle prices and slaughterings were reduced sharply. Since practically all countries in the region, in particular Brazil, Chile, Colombia, Mexico and Uruguay, are undertaking major efforts to raise beef production, the share of Argentina in the regional total declined from 40 percent in 1961-65 to 30 percent in 1971. In this period Brazil's share rose from 25 to 29 percent and in 1971 production of beef and veal continued the upward trend to reach a record level of almost 2 million tons. Yields are comparatively low and there is a considerable future production potential. In Colombia, there has been abundant pasture in recent years owing to heavy rains throughout the country and cattle slaughter continued to expand in 1971. Also in Mexico slaughterings increased, reflecting to some extent drought-induced culling during the first half of 1971.

Regional milk production recovered from the slight fall of 1970, and major gains are reported for several countries, including Chile, Colombia, Mexico and Nicaragua. In Chile weather, an important factor in milk production, was on the whole favourable in the major dairy regions. Higher producer prices, restrictions on the slaughter of dairy cows, as well as government credits and technical assistance to improve herds and pasture, purchase equipment and construct milk-processing plants, acted as positive production incentives. Similar programmes exist in Colombia, Nicaragua and several other countries. In Mexico, the accelerating upward trend reflects government efforts to increase domestic milk production to offset decreasing supplies.

The 2 percent decrease in regional wool production in 1971 is attributed mainly to a reduction both of sheep numbers and yield per animal in Argentina and Uruguay, the largest producers. In Argentina, depressed world market prices have caused a number of sheep farmers to move into more remunerative lines of production, such as cattle or oilseeds. In Uruguay, in addition to a difficult market situation, early autumn frosts and a hard winter resulted in heavy death losses of lambs and ewes.

Agricultural labour and capital inputs

Since an estimated 42 percent of the economically active population of the region continues to be engaged in agriculture, generating only some 17 percent of the regional GDP, it is obvious that the average output per person is significantly below that of most nonagricultural sectors. However, wide differences exist among the various countries of the region. In Argentina and Uruguay the ratio between agricultural GDP and agricultural labour force is almost 1:1, while in Brazil and a number of other countries, including Colombia, Costa Rica, Ecuador, Guatemala and Nicaragua, this ratio is about 1:2. In Mexico and most of the remaining countries, including Bolivia, Chile and Peru, it is 1:3. Within individual countries the disparities in labour productivity reflect the dualistic character of their economies. Capital-intensive production, mainly for export, in many countries exists side by side with a large subsistence agriculture using little or no purchased inputs. However, there are indications which suggest a growing capitalization of agriculture.

Fertilizer application increased in most countries of the region, particularly in Brazil, where total consumption in 1970/71 reached 958 000 tons, a large increase over the preceding season. Two countries, Brazil and Mexico, use more than half the fertilizer total for the region. In Argentina and Venezuela applications are low (5 kilogrammes per hectare) but in a number of smaller countries such as Barbados, Cuba and Jamaica as much as 200, 132 and 113 kilogrammes per hectare respectively were applied in 1970/71. Consumption is well above the regional average (24 kilogrammes per hectare) in Peru, Chile and Colombia. Fertilizer use varies within countries. In Brazil, farmers in the state of São Paulo use some 60 percent of the national total. The largest users are the big estates producing export crops such as sugarcane (Brazil, Mexico, Cuba, Peru, Colombia, Barbados and Jamaica), bananas (Ecuador and Central American countries), cotton

(Brazil, Colombia, Mexico and Peru) and, to a lesser extent, coffee (Brazil, Colombia, El Salvador).

As with fertilizers, so for irrigation, which in Latin America is used mainly for the production of export crops (sugar in Peru, cotton in Mexico) and to a much lesser extent for domestic food crops (rice in Brazil and fruit and vegetables in Chile). Some 11.5 million hectares or 8 percent of the total cropland in Latin America are irrigated. Mexico alone with about 5 million hectares accounts for 45 percent of the regional total. In only a few countries is there a large proportion of total cropped area irrigated: for example, Peru (40 percent), Chile (29 percent) and Mexico (16 percent). In Argentina and Brazil only 6 and 2 percent respectively of the cropland are irrigated. In Brazil, however, greater emphasis is being given to irrigation, particularly in the potential drought areas of the northeast. As part of the national irrigation plan, some 824 000 hectares of arid land will be made cultivable through 70 irrigation projects by 1974, and at costs which vary from U.S.$100 to $2 200 per hectare.

Mechanization of agriculture continues. There was another rise of 5 percent in the number of tractors in 1970 bringing the total to 580 000 units, but these are concentrated in a few countries. Argentina alone with 180 000 accounted for almost one third of the total, while Brazil and Mexico made up another third, leaving the remainder principally to Cuba, Chile, Colombia, Uruguay and Venezuela. The intensity of tractor use varies considerably between the countries, from 200 hectares and less of cropland per tractor in Argentina, Chile, Cuba and Uruguay, and more than 500 hectares per tractor in Bolivia, Ecuador, Guatemala and Honduras. The regional average is about 200 hectares per tractor, reflecting the dominant position of Argentina. Mechanization is mainly confined to limited geographic regions, certain crops and the larger farms. In Argentina, 70 percent of the tractors are used in the pampa region, and in Brazil some 30 percent are in the southern states. In most of these areas there is one tractor to from 50 to 100 cultivated hectares, not far short — at the lower figure — of the ratio of 1 to 40 in North America. The pattern of mechanization is strongly influenced by farm size, with animal traction and human labour still the main source of power for the large number of small farmers.

The effects of mechanization on agricultural employment in Latin America are being given increased attention. A recent study [28] examining labour requirements for nine main field crops with and without mechanization indicates that mechanization is currently associated with a reduction in labour per hectare of 15 man-days in Chile and 21 in Colombia, and that about three workers are displaced by each tractor in Chile and about four in Colombia. These findings are particularly relevant because of the rapid population growth in the region, about 2.9 percent per year.

[28] Abercrombie. K.C.. Agricultural mechanization and employment in Latin America, *International Labour Review*. forthcoming.

Trade in agricultural products

According to preliminary data, the region's export earnings from agricultural products were almost 3 percent below those of 1970 (Table 2-31). The slight increase in average unit values did not offset losses from smaller shipments. Exports of wheat from Argentina, raw sugar from Cuba, meat (mainly beef and veal from Argentina and Uruguay), and raw materials (reduced cotton shipments from the major exporting countries, Brazil, Mexico and Peru), experienced the strongest losses.

The fourth consecutive increase in the value of cereal exports must again be attributed to maize, favoured by higher prices and with expanded sales reflecting the upward trend in production. On the other hand, the sharp fall in Argentina's wheat exports following the previous year's setback in production led to a decrease in their value of 61 percent, the lowest since the early 1950s.

Significantly increased sugar exports from Brazil, Colombia, the Dominican Republic and Guyana, which benefited from increasing world prices as a result of the shortfall in 1970/71 production, could not offset the considerable losses experienced by Cuba, the region's largest exporter. The drop in exports from that country reflected the reduction in shipments to the U.S.S.R. under trade agreement quotas which were only half those in 1970, and regional earnings from sugar were slightly below the high level of the previous year.

Increased supplies of bananas, particularly high-quality Cavendish varieties in Central and South America, depressed prices on unrestricted markets, and gains from larger shipments, mainly from Honduras, were almost entirely offset by lower unit values. Exports from Ecuador, the world's leading banana exporter, declined slightly. This country is expanding production of Cavendish varieties, and in 1971 an estimated 80 percent of its banana exports, totalling 1.3 million tons, were of this type.

World market prices for beef continued to rise through 1971 reflecting the general shortage in relation to demand, so that the 34 percent drop in shipments from Argentina was almost offset by higher unit returns. The situation was similar in Uruguay, the second largest meat exporter in Latin America, where lower sales were to some extent compensated by higher prices. Brazil's beef exports

TABLE 2-31. – LATIN AMERICA: INDICES OF VALUE OF EXPORTS OF AGRICULTURAL PRODUCTS

	Share of total agricultural exports in 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
	Percent	..... *1957-59 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	117	124	132	151	147	— 3
Food and feedstuffs	60	145	143	156	187	196	+ 5
Cereals	10	183	166	182	208	218	+ 5
Sugar	22	125	121	123	165	165	—
Bananas	6	134	140	140	145	148	+ 2
Meat	12	143	154	203	225	261	+ 16
Beverages and tobacco	30	92	106	105	125	109	— 13
Coffee	27	93	107	102	126	107	— 15
Cocoa	2	82	85	125	98	81	— 17
Raw materials	10	104	117	132	115	103	— 10
Cotton	6	108	127	151	125	112	— 10
Wool	2	93	105	93	88	73	— 17

[1] Preliminary.

suffered from slaughter restrictions and export quotas, and total sales were back to the 1969 level of 78 000 tons against 98 000 tons in 1970. Larger shipments of coffee from the major exporters did not offset the effects of lower world market prices, and the region's earnings from coffee dropped by 15 percent compared with 1970. In Brazil, the world's largest coffee producer and exporter, exports exceeding 1 million tons were up 7 percent from 1970, but earnings fell 19 percent. In Colombia, also, larger sales could not compensate lower prices, and the value of coffee exports was 12 percent below 1970.

The volume of regional cocoa exports continued to increase and in 1971 reached the record figure of 229 000 tons. However, despite these larger shipments, particularly from Ecuador where exports recovered from the low level of the previous two years to reach 51 000 tons (an increase of 42 percent), and from Brazil, the region's main exporter and where output has been growing, earnings decreased as world prices fell due to expectations of a slight surplus of 1970/71 production over 1971 utilization.

Sharply reduced cotton shipments from Brazil, Mexico and Peru, by 25, 22 and 27 percent respectively, were responsible for a 19 percent drop in regional cotton exports. Although unit values were up for the third consecutive year reflecting higher prices as a result of lower world production, regional earnings still declined by 10 percent. The comparatively poor results in Brazil were attributed to the 1970 drought in the northeast that seriously affected the 1970/71 cotton production in that region, while also in the southern states output fell because of adverse weather. However, exports are expected to expand in 1972 as 1971/72 production in the region recovered substantially, reflecting in part the expanded acreage in Brazil and Mexico stimulated by higher prices.

The index of agricultural imports shows an overall increase of 3.6 percent compared with 1970. Major increases occurred in sugar, oils and oilseeds, and dairy products, for which the index of import values went up by 44, 30 and 20 percent respectively. In the case of sugar and dairy products the unit values increased by 15 percent compared with 1970. Imports of cereals, live animals, and beverages and tobacco were smaller in terms of both volume and of value. The further decline in the region's cereal imports was due mainly to lower wheat purchases by Brazil, but maize imports were also back to normal as Mexico recovered from the effects of drought on the 1969 crop and the country's maize imports fell to 17 000 tons, against 761 000 tons in 1970.

Development plans and policies

Planning can be credited with increasing the awareness of the fundamental development problems of the Latin American countries. Almost all have, by now, prepared medium- or long-term general

development plans, including public investment programmes. Most have short-term "operational" plans.

In 1971 or early 1972 development plans were started in Argentina, Brazil, Chile, Guatemala, Paraguay and Peru, and are being drafted in Ecuador, El Salvador, Honduras and Nicaragua.

Increased attention in these plans is being given to regional inequalities and income distribution. Other major items include action to curb inflation, to develop agriculture, agrarian reform and social services (education, health and housing).

In Argentina, the five-year plan (1971-75) is based on a compound growth rate of 7 percent in GDP, almost double that (3.7 percent) of the past decade. This target requires a 6.2 percent growth rate in 1971, with progressively higher rates in subsequent years, to 8 percent in 1975. During the first nine months of 1971, however, GDP grew only by 2.9 percent, much less than the 4.5 percent of the same period in 1970. The agricultural sector is given an annual growth rate of 4.6 percent, twice as high as in recent years. Export growth at 9 percent annually is a major feature of the Argentine plan.

In Brazil, a significant feature of the plan (1972-74) is the intention to create "popular capitalism." The Government explicitly states its determination to do everything possible to improve the living standards of the poor. A new strategy is outlined to correct disparities in regional development in a scheme for national integration covering the Amazon and northeast regions, which gives first priority to the opening up of Amazonia. Joint action by federal and state governments and private enterprise to raise incomes is encouraged. Among its objectives are a determination to put Brazil among the world's developed countries by the year 2000, to double per caput income between 1969 and 1980, maintain annual growth rates of 8 to 10 percent up to 1974, and reduce the rate of inflation to 10 percent by that year.

The agricultural sectoral plan consists of updating programmes and projects listed in earlier documents as well as new agrarian reform measures and colonization projects. Significantly, in comparison with the previous plan, more emphasis is given to agriculture, education, health and hygiene, and relatively less to industry. Export growth is underlined.

Overall planning in Costa Rica has recently been strengthened by a law which reforms the Central Bank, the national banking system and the autonomous institutions.

A 1971-74 agricultural development programme has been drafted as the basis for an AID loan which will influence Costa Rica's planning process at the sectoral level by channelling part of the funds to the strengthening of the Ministry of Agriculture and Livestock.

The national development plan for 1969-72 went into effect at the end of 1969, but the extent to which it now constitutes the basis of the country's development priorities and sets the pattern for allocating resources is limited. As it stands, the plan is not subject to periodic evaluations or controls. Its implementation has been made more difficult as a result of the disruption of regional trade produced by the El Salvador-Honduras conflict. In addition, a new government, following the elections of February 1970, has brought about a change in emphasis and priorities.

The plan predicted that for 1969-72 average annual growth rate in GDP would be 8.4 percent, while per caput GDP would be 4.8 percent. This was based on the assumption that industrial and agricultural production would maintain growth rates of 11.9 and 9.6 percent respectively, and that exports would increase by 14 percent annually, accounting for 38 percent of GDP by 1972.

Current development priorities consist in improving the Government's financial situation by increasing incomes from taxes and duties and controlling credit expenditures; strengthening the short- and medium-term financial planning process; expanding and diversifying exports; and increasing the internal market and overall production capacity by providing an adequate social and economic infrastructure.

Costa Rica's agricultural policy has generally concentrated on promoting exports, and self-sufficiency and stable prices for producers and consumers, and to some extent it has achieved these objectives.

The Planning Office of Haiti has recently released a document, *Priorités de la planification et projections quinquennales 1971-76*, which attempts to define the economic objectives and strategy of the Government for the period covered. The Government envisages a growth rate of 7.7 percent, which would represent a great effort compared with about 4.5 percent annually in 1968-70. With a population growth of 2.4 percent, per caput GDP would increase from 370 gourdes in 1970/71 to 475 in 1975/76. Total public investment is expected to amount to 730 million gourdes in five years, from domestic (48 percent) and foreign resources (52 percent). Agriculture is expected to increase at a rate of 8.6 percent and absorb 27 percent of total public investment. Mobilization of human resources through cooperative organization and community development is considered the main objective of the agriculture programme. The share allocated to education, at only 2.7 percent of total investment, is extremely low in relation to the enormous needs of the country in this field.

Honduras is at present intensively engaged on the preparation of a new development plan for the period 1972-77.

A five-year plan for 1965-69 was followed by the *Plan de Acción 1969-71*. However, it was not implemented due to the conflict between Honduras and El Salvador, and a *Plan de Emergencia* was prepared in 1970, to deal mainly with the problems which had arisen in the frontier areas. The general development activities of the Government are contemplated in the programme of public investment for the period 1970-74, which foresees that infrastructure (mainly transport and electricity) will absorb some two thirds of the total expenditure.

In Mexico, which so far has not formulated a national development plan, government activities are shaped within the general objectives of the social economic policy which is set out by each federal administration.

Since 1962, Paraguay has prepared three national development plans. In past planning, difficulties have arisen from inadequate coordination between the plans and the annual budget of the public sector; lack of clearly defined projects supported by feasibility studies; and the limited participation of the private sector. The proposed 1971-75 economic and social development programme puts emphasis on a changing pattern of investment, from infrastructure to the productive goods sector. It expects an increase of 6 percent a year in GDP, compared with about 4 percent annually in 1962-69. Development is planned within strict confines of monetary and exchange stability. The plan emphasizes the need to increase investment in the commodity producing sectors. The objective of raising the growth rate to 6 percent in the medium term appears feasible, with the opportunities which exist for improving exploitation of Paraguay's agropastoral and forestry resources and the continued rapid growth in the tourist industry. The key factor is the level of public investment. The projected level appears somewhat higher than that needed to achieve the target growth rate. Also, its very size could limit provision of adequate credit for the commodity producing sectors.

The first stage of the plan deals with existing infrastructure projects and changes in the tax system. The second provides for expansion of existing industries, including agricultural and forestry (especially in the export-oriented sectors), improvement of marketing systems, and new industries.

In Peru the Government has approved a five-year development plan (1971-75) which requires foreign finance totalling $1 816 million between now and 1975, and an annual growth rate of 7.5 percent. It has also been encouraging capital formation. A new development finance corporation (COFIDE) has been established to provide long- and short-term financing to public and private industry. The Government is also attempting to increase the participation of Peruvians in and their share in the control of the mining, manufacturing and fishing industries.

Venezuela has issued its 1970-74 economic plan which differs from others in its emphasis on shifting the country away from oil production and import substitution as the generators of development, relying more on the development of other export industries and a realignment of Venezuela's trade policy.

In relation to the performance of the Venezuelan economy in the past few years, the plan sets some ambitious goals. They include a 6.3 percent average annual growth in GNP through 1974, based on a 2.6 percent average annual increase in petroleum production and a 7 percent gain for the rest of the economy. Manufacturing, energy and construction are expected to grow at the fast rate of 9.6 percent, agriculture at 6.1 percent and services at 5.5 percent. The most ambitious targets, however, are in foreign trade, where Venezuela has been held back by the slow growth of oil exports, which account for 90 percent of total export value. Total exports are planned to increase at an average annual rate of 4.1 percent, while exports of petroleum and its derivates will grow by 2.5 percent annually, that is, at recent levels.

Trade expansion is expected in fruit and vegetables, fish products, steel and petrochemical products, aluminium, and natural gas.

The 1970-74 plan requires an outlay of U.S.$181 million for the agricultural development programme. Total private and public gross investment in agricultural machinery and equipment is programmed at $213 million through 1974. The Government's investment targets may now be too low, as the original estimates were made before the 1970 increase in government petroleum revenue.

Regional economic integration

The year 1971 was not a good one for Latin American economic integration, either for the Latin American Free Trade Area (LAFTA) or the Central American Common Market (CACM).

The 1971 LAFTA conference had disappointing results. Only two resolutions dealt exclusively with agriculture (282 and 283), referring to unfinished studies on a system for improving market information and on the financing of agricultural exports, both of which should already have been completed. The conference established a plan of action for

1972 which included continuation of studies for agricultural commodity analysis, analytical and comparative studies of national programmes of agricultural development, and of integration policies in the fields of marketing, hygiene in processing and animal health regulations. The president of this conference expressed the view that delay in completing agricultural studies was caused by the fact that "agricultural production represents one of the most difficult problems to resolve not only in LAFTA but in any integration process of multilateral markets in the field of international trade." The lack of noteworthy progress is also understandable when it is considered that, since the Caracas Protocol of 1969, the association has entered into a process of evaluation and appraisal with a view to negotiating, in 1974, the basis for a second and decisive stage of the integration process.

The most interesting of the sectorial meetings held in 1971 was the vine-and-wine industry meeting (Montevideo, July), the first organized in that field of activity and one of importance to the region: production of various types of wine, in 1970 for example, reached 1 900 million litres in Argentina, 500 million litres in Chile, 340 million litres in Brazil and 105 million litres in Uruguay. Delegations to this meeting agreed on promoting import substitution from third countries and recommended that the permanent executive committee should request the LAFTA secretariat to prepare questionnaires to gather basic information, including costs of installation of vineyards, grape and wine production, marketing, and so on, in order to plan for the liberalization of intraregional trade of vine and wine products.

Other sectorial meetings were held on canned food (Bogotá, June) and agricultural machinery (Montevideo, June).

Within the Central American Common Market, effects of the trade suspension between Honduras and El Salvador, and difficulties in the trade relations of Honduras with Costa Rica, Guatemala and Nicaragua have affected the value of trade within the subregion, which fell by 9 percent in the first semester of 1971 compared with 1970. In December, the ministers of economy of the five countries met in Managua, Nicaragua, to find a basis for restoration of normal trade relations between Honduras and Costa Rica, Guatemala and Nicaragua.

Advised by a special project administered by UNCTAD, in which FAO participates, the permanent secretariat (SIECA) is now evaluating the integration process in Central America and formulating the basis for its improvement.

In November 1971, the third meeting of the Coordinating Commission for Marketing and Price Stabilization was held, at which representatives from Honduras participated with representatives from the other four member countries. The main resolutions approved included ratification of the agreements of the recent meetings of the directors of price stabilization organisms, support for the project of the Regional Fund of Price Stabilization for Basic Grains (to be administered by the World Food Programme), and the request to SIECA for a study to help unify criteria for fixing guaranteed minimum prices.

Although Bolivia and Ecuador have had some difficulties in taking advantage of preferential advantages offered to them by the Cartagena Agreement, the Andean group continues to show strong vitality. A major success in 1971 was the putting into effect, as of 30 June, of the Common Regimen of Treatment for Foreign Capital. The Cartagena Agreement Commission adopted in November and December ten decisions, including one to establish the basis for negotiation of the closer incorporation of Venezuela in the group and another on measures to improve agricultural trade. These measures included establishment of a subregional statistical information system relating to production, imports, exports, prices, and sown and harvested areas of agricultural products. It also requested a programme for agricultural marketing training, and that the Andean Corporation for Development finance projects of marketing facilities with a view to improving intrasubregional agricultural trade, and particularly the trade originating from Bolivia and Ecuador.

The Commission has begun a study for a strategy of subregional development and, with the assistance of FAO, has completed an initial draft on agriculture which has been considered by the Council of Planning of the Commission, which met for the first time on 3 and 4 April 1972.

The Caribbean Free Trade Association (CARIFTA) has made progress in the fixing of a common external tariff and in promotion of nontraditional exports. In August 1971 there were meetings on plant quarantine and animal health regulations which formulated recommendations for the improvement of legislation in these fields. The CARIFTA Ministers' Council met in October to approve, in principle, a proposal of FAO/UNDP for a project of technical assistance for agriculture in the less developed countries of the region.

As far as subregional trade is concerned, the results continue to be less than those expected from the Agricultural Marketing Protocol, and favour the more developed rather than the less developed countries. The most serious barrier to trade expansion in the region is the present structure of agriculture. This has led the CARIFTA secretariat to

give priority to the rationalization of agriculture and the improvement of marketing structures and facilities.

Since 1970 economic integration in Latin America has been in a phase of self-evaluation and analysis. The most important and difficult problem concerns the equitable distribution of its benefits, both among member countries and between the modern and traditional sectors within countries. This calls, as far as agriculture is concerned, for regional coordination of the national programmes of production and supply. It is toward this goal that each of the four Latin American integration programmes are now moving.

Far East

DEVELOPING COUNTRIES

The tempo of economic activity slowed in 1971 due to reductions in growth in Ceylon, India, Malaysia and Pakistan.[29] However, satisfactory growth rates in the gross national product were recorded by the Republic of Korea (10.2 percent), Singapore (10 percent), Hong Kong (8 percent), Indonesia (6.9 percent), the Philippines (6.5 percent), Burma (6.2 percent) and Thailand (6.1 percent). These rates not only exceeded the growth targets set for the Second Development Decade but were also, except for Singapore and Hong Kong, higher than in the previous year. A substantial increase in the manufacturing sector in most of these economies contributed to the impressive increases.

GNP in Malaysia increased by 6 percent, against the plan target of 6.5 percent for 1971. In India, in spite of adverse natural conditions (drought, floods and cyclone) and the strain imposed by refugees and the war with Pakistan, national income rose by 4 percent againt 5.5 percent in the previous year. The lower rate was chiefly due to a slowing down in industrial production. In Pakistan, owing to war and disturbed conditions, GNP increased by 1.4 percent only against 6.6 percent in 1970, while Ceylon and Nepal did not make much progress. Similarly the war-distressed economies of the Khmer Republic, Laos and the Republic of Viet-Nam failed to register any significant economic improvement.

Agricultural production

Agricultural production in the developing countries rose by only 1 percent in 1971 against the 4 percent annual increase recorded during the previous two years. The low rate was due to crop losses which occurred in a number of countries from adverse weather conditions, war and other factors. The increase in output in India and Indonesia was smaller than the previous year. The level of production in Burma remained virtually unchanged, while in Ceylon, the Khmer Republic, Laos, Nepal and Pakistan production went down. An 8 percent increase in output in the Republic of Viet-Nam was the highest in the region. This was followed by a 7 percent rise in West Malaysia. The rate of growth among other countries which registered some increase did not exceed 3 percent (Table 2-32).

Among major crops the biggest expansion was in cotton (27 percent), followed by oil crops [30] (20 percent), coffee (19 percent), and oilseeds (7 percent). The output of natural rubber rose by 3 percent while tea production remained unchanged. The production of jute and kenaf fell by 11 percent, owing mainly to disturbed conditions and war in Bangladesh, one of the main producers. Food production increased by only 1 percent compared with 5 to 6 percent a year since 1967. There was a slight decline in sugar (2 percent). The cereal crops, particularly rice and maize, suffered serious setbacks in a number of countries due to inclement weather, typhoons, floods, infestation, civil disturbances and war. Because of the fall in output of maize, rice and barley, cereal production was lower than the previous year. The production of pulses also fell by 6 percent. Wheat output went up by 8 percent to 31 million tons. Livestock production increased by 2 percent.

The small increase in production resulted in a decline in per caput food output in the region. Only in West Malaysia, the Republic of Viet-Nam and Sabah (Malaysia) was the increase large enough to allow for a significant improvement in per caput food output. In Indonesia there was no change. In all other countries per caput food production declined. The decline once again highlighted the

[29] All references to Pakistan in the text and tables of this section apply to the former West and East Pakistan, as the facts and figures quoted relate for the most part to the period prior to their separation.

[30] Includes copra (in oil equivalent), olive oil, palm oil and palm kernels (in oil equivalent).

TABLE 2-32. – FAR EAST: [1] INDICES OF FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971 [2]	Change 1970 to 1971	1967	1968	1969	1970	1971 [2]	Change 1970 to 1971
	..... *1961-65 average = 100*					*Percent*	..... *1961-65 average = 100*					*Percent*
Food production												
SOUTH ASIA	106	113	117	122	122	—	96	99	100	103	100	— 2
Ceylon	112	118	116	126	117	— 7	102	105	101	107	97	— 9
India	104	110	114	121	122	+ 1	94	97	98	102	100	— 2
Nepal	105	109	114	119	118	— 1	97	100	103	105	103	— 2
Pakistan	114	122	127	127	125	— 2	101	105	107	104	99	— 5
EAST AND SOUTHEAST ASIA	108	113	118	125	127	+ 2	97	99	101	103	103	— 1
Burma	105	107	107	110	111	+ 1	96	96	94	95	93	— 2
Indonesia	102	112	113	122	126	+ 3	93	99	97	103	103	—
Khmer Republic	104	125	106	143	113	— 21	94	109	90	118	91	— 23
Korea, Rep. of	113	113	131	130	132	+ 1	102	99	112	108	106	— 1
Laos	131	122	138	142	136	— 4	120	109	120	120	113	— 6
Malaysia												
Sabah	109	127	133	131	142	+ 9	93	105	107	101	105	+ 5
Sarawak	98	114	130	128	128	—	87	99	109	104	100	— 4
West Malaysia	115	125	136	146	161	+ 10	102	109	115	120	128	+ 7
Philippines	116	114	124	128	130	+ 2	101	96	101	100	99	— 1
Thailand	107	115	125	128	131	+ 3	95	99	104	103	103	—
Viet-Nam. Rep. of	96	91	103	112	122	+ 9	87	80	88	94	99	+ 6
Developing countries	106	113	117	123	124	+ 1	96	99	101	103	101	— 2
JAPAN	118	124	123	121	117	— 4	113	118	115	112	107	— 5
Agricultural production												
SOUTH ASIA	106	112	116	121	122	+ 1	96	99	100	101	99	— 2
Ceylon	109	113	112	116	111	— 4	99	101	97	98	93	— 6
India	104	109	113	119	122	+ 2	94	97	98	101	100	— 1
Nepal	104	109	114	119	118	— 1	97	100	102	105	102	— 2
Pakistan	115	122	128	127	124	— 3	102	105	107	104	98	— 6
EAST AND SOUTHEAST ASIA	108	113	119	125	128	+ 2	97	99	102	104	103	—
Burma	105	107	107	110	111	—	96	97	95	95	93	— 2
Indonesia	102	111	113	121	125	+ 3	93	99	98	102	103	+ 1
Khmer Republic	106	125	107	136	111	— 18	95	109	91	112	89	— 21
Korea, Rep. of	115	115	133	132	135	+ 2	103	101	114	109	109	— 1
Laos	132	123	139	142	137	— 4	121	110	121	121	113	— 6
Malaysia												
Sabah	106	119	129	128	129	—	91	99	103	99	95	— 3
Sarawak	83	87	112	92	90	— 3	74	75	94	75	70	— 6
West Malaysia	118	131	146	152	163	+ 7	105	114	124	125	129	+ 3
Philippines	114	114	123	126	129	+ 2	100	96	100	99	98	— 2
Thailand	108	115	125	129	133	+ 3	96	99	104	104	104	—
Viet-Nam, Rep. of	94	88	100	109	118	+ 8	85	78	86	91	96	+ 6
Developing countries	107	112	117	122	124	+ 1	97	99	101	102	101	— 1
JAPAN	117	123	121	119	115	— 3	113	117	114	111	106	— 5

[1] Excluding People's Republic of China. – [2] Preliminary.

need for continued efforts to expand production on the one hand and to control population increase on the other. Considerable effort and intensive research will have to be undertaken to overcome the deficiency of the new varieties, particularly of rice and other cereals, and to evolve suitable new varieties. More attention must also be paid to the livestock sector which has good potential but has made only limited progress so far.

The highest rate of increase in the region was in the Republic of Viet-Nam (8 percent), due mainly to a substantial increase in rice output. In West Malaysia a higher output of most crops contributed to a 7 percent increase in agricultural production. Palm oil output continued its rapid rise (37 percent) mainly as a result of increased yield from newly planted areas. Paddy production rose by 8 percent, reflecting the self-sufficiency drive and expansion of double-cropped area. The rubber crop increased by 4 percent with higher yields resulting from an extensive replanting programme, use of better material, improved planting techniques and new credit policies. Production of poultry, eggs and pigmeat increased slightly.

In India, foodgrains and most of the cash crops contributed to the increase of 2 percent. The foodgrain harvest increased for the third successive year to 106 million tons, 4 percent above the preceding year's record. This helped to achieve the goal of self-sufficiency and will enable India to dispense with the concessional imports of foodgrains from 1972. Although output of all cereals except millets expanded, the substantial wheat increase contributed a major share to the total figure, and rice output rose by 4 percent.

Because of good weather conditions, a favourable year in the production cycle and higher yield, particularly from the newly planted area, coffee made the most impressive gain (73 percent) with a record crop of 110 000 tons, followed by cotton (27 percent), rapeseed (26 percent), jute and wheat (16 percent each). Cotton output rose due to favourable weather and the introduction of new hybrid varieties. Rubber production went up by 7 percent and tea and tobacco by 3 percent each. Sugarcane dropped by 5 percent because of dry weather at sowing time, diversion of area to other crops owing to low cane prices during the previous two seasons, and the damage caused by floods and drought to the standing cane crop.

The growth in Indonesia (3 percent) is mainly attributed to a further sizable increase in paddy (6 percent) which contributes roughly half of the total agricultural crop. Good weather conditions combined with rehabilitation of irrigation systems, wider use of better seeds and fertilizers supplied through the improved Bimas and Inmas rice intensification programmes, and price support were responsible for increased rice output for three successive years, with a record of 18.6 million tons in 1971. Production of centrifugal sugar went up considerably (12 percent). There was also an increase in output of palm oil (15 percent), tea (9 percent) and copra (5 percent), but a significant decline in soybeans (20 percent) and maize (9 percent).

In the Philippines the rice crop declined by 2 percent because of poor weather conditions, civil disturbances in several main producing areas, numerous typhoons and damage caused by widespread tungro infection. However, copra production increased to a record 1.7 million tons, 26 percent above last year's level, owing to good rainfall and increases in the number of bearing trees. Tobacco output dropped by 8 percent as a result of damage caused by floods and a reduction in the area under tobacco for flue-curing because of the very low prices that prevailed during the previous marketing season. Sugar (centrifugal) production declined by 7 percent. Dairy and other livestock products did not make any significant progress. Poultry products, however, increased by 11 percent.

Burma's agricultural production reflected the growth in jute (48 percent), wheat (32 percent) and maize (9 percent). Production of paddy, which accounts for three quarters of total crop output, remained almost constant, while tobacco declined by 18 percent.

In Thailand, an increase in the production of sugar (45 percent) and rubber (10 percent), contributed to the 3 percent increase.

The Republic of Korea recorded a 2 percent increase in output compared with the preceding year's drop. This was largely because of an increase in the tobacco crop (29 percent) and livestock products (6 percent), especially milk, meat and eggs. Owing to bad weather and falling farm area, production of rice increased only slightly, wheat output declined by 10 percent, while barley, maize, sorghum and millet declined by 2 percent. To meet increasing domestic demand, 1971 rice imports amounted to more than 1 million tons, the highest figure in three decades. Imports of wheat increased by 33 percent to 1.67 million tons, imports of maize amounted to 437 000 tons, and of soybeans to 61 000 tons, 69 percent more than 1970.

In Ceylon, due to the outbreak of insurgent activities, agricultural output declined by 4 percent. Output of paddy declined by 14 percent to 1.4 million tons, and rubber and tobacco production were 11 and 8 percent respectively below last year's level.

In Pakistan, agricultural production fell by 3 percent, while disturbed and uncertain conditions due to war were reflected in a large fall in agricultural production in the Khmer Republic (18 percent).

The disastrous floods in the Vientiane plain affected the rice crop in Laos, resulting in a drop in overall output.

High-yielding cereal varieties

The area under high-yielding varieties increased by 3.8 million hectares to 19.2 million hectares in 1971 (Table 2-33). The planting of new varieties of wheat in 1970/71 reached 8.95 million hectares, constituting 37 percent of the crop area in India, Nepal and Pakistan. As can be seen from the continuous rapid increase in production in the region, these varieties of wheat seem to be well established, particularly in those areas which have an assured water supply. A number of new high-yielding wheat varieties with better consumer acceptability, short growing season and adaptability over a wide area were released in these countries during 1971 for irrigated and dryland farms.

New varieties of International Rice Research Institute (IRRI) rice have not spread as rapidly as high-yielding wheat varieties, although they are gradually becoming important. The performance of rice varieties in 1971 was limited due to poor climate and disease [31] in a number of countries. The problems of the diseases which attack some of the IRRI varieties and slow acceptance by farmers and consumers in many countries still remain to be solved. However, a switch from IR8 to other varieties such as IR20 and IR22, which are more disease-resistant and more acceptable to consumers, is already under way. In 1970/71 high-yielding varieties of paddy were planted on 10.23 million hectares, compared with 7.73 million the previous year. However, this represents only 13 percent of total rice area in these countries. The proportion of area planted to high-yielding rice varieties was highest in the Philippines, followed by West Malaysia, but India accounted for more than 50 percent of the region's total rice area under high-yielding varieties. The area in the Philippines increased from 1.4 million hectares in 1969/70 to 1.6 million in 1970/71, while in West Malaysia the new varieties were planted on 132 000 hectares against 96 000 the year before. In India, the area increased from 4.3 million to 5.5 million hectares, and in Indonesia to almost 1 million hect-

[31] In the Philippines tungro infestation became widespread during 1971.

TABLE 2-33. – FAR EAST: AREA UNDER HIGH-YIELDING VARIETIES OF WHEAT AND RICE IN SELECTED COUNTRIES, 1967/68 TO 1970/71

	1967/68	1968/69	1969/70	1970/71 [1]		Area under high-yielding varieties as percentage of total
				Area under high-yielding varieties	Total area	
	Thousand hectares					*Percent*
WHEAT						
India	2 942	4 793	4 910	5 892	17 891	32.9
Nepal	25	54	76	98	[2]388	25.3
Pakistan	957	2 396	2 690	2 959	6 186	47.8
TOTAL	3 924	7 243	7 676	8 949	24 465	36.6
RICE						
Burma [3]	3	167	144	201	4 976	4.0
Ceylon [4]	—	7	26	30	[2]651	4.5
India [3]	1 784	2 681	4 341	5 501	37 431	14.7
Indonesia [3]	—	198	750	932	8 237	11.3
Laos	1	2	2	54	[2]769	7.0
Malaysia (West)	64	91	96	132	541	24.5
Nepal	—	43	50	68	[2]1 174	5.8
Pakistan	71	462	765	1 087	11 416	9.5
Philippines [3]	701	1 012	1 354	1 565	3 113	50.3
Thailand [3]	—	—	—	[5]162	7 600	2.1
Viet-Nam, Rep. of	—	40	201	502	2 599	19.3
TOTAL	2 624	4 703	7 729	10 234	78 507	13.0

SOURCE: U.S. Department of Agriculture, *Imports and plantings of HYV of wheat and rice in the less developed nations*, Washington, D.C., Foreign Economic Development Service, 1972, Report No. 14.

[1] Preliminary. – [2] 1969/70 area. – [3] Includes improved local varieties. – [4] Excludes improved local varieties (averaging over 400 000 hectares). – [5] Rough estimate.

ares. In Burma, Ceylon and Thailand the performance of IRRI varieties has not been very impressive owing to weather and disease problems, and the absence of well-controlled irrigation systems.

The successful extension of new varieties on a large scale raises a number of urgent problems. It is imperative that adequate facilities for water distribution be provided in a number of countries. Efficient distribution systems for inputs and the marketing of output need to be established. Although some countries in the region have already taken measures to provide increased credit to farmers, arrangements are still required for making credit and other public facilities more readily available to small and marginal farmers.[32] Intensive research is also required for evolving disease-resistant varieties of rice and other crops, for both irrigated and dryland areas.[33] More attention must be given to income distribution and to increasing the labour utilization for the new varieties.

The limited impact of the high-yielding varieties on production or the levelling off of their effect is a matter for some concern. Although enough data about yield are not yet available, the small impact on production so far, particularly in the case of rice, is due to limited area planted and constraints such as relatively low fertilizer application and planting on less suitable land. However, the limits of new varieties do not yet seem to have been reached. Farmers in many of these countries in fact are not reaping anything like their full potential because of the factors listed above. Expansion of the area under current strains of high-yielding varieties is likely to be limited by ecological, structural and other constraints. Considerable scope does exist for increasing production with varieties evolved from crosses between native and IRRI strains for rice and the native and CIMMYT (International Wheat and Maize Improvement Centre) varieties for wheat. In fact, a number of such rice and wheat varieties have been bred in these countries, some of which are already grown extensively, while others are undergoing experimental trials.

Fertilizer use

Fertilizer consumption after an impressive yearly increase of 17 percent in the previous two years, went up by 8 percent to 4.9 million tons in terms of plant nutrients in 1970/71 (Table 2-34). The slower growth could be ascribed mainly to reductions in planted area due to adverse weather conditions in some countries and lack of credit facilities and higher fertilizer prices in others. In recent years, the need for balanced fertilizers has been increasingly recognized and attempts made to promote their use. During the year the consumption of potassic fertilizers increased by 11 percent, nitrogenous fertilizers by 8 percent to 3.2 million tons and phosphatic fertilizers by an estimated 7 percent.

In Indonesia good weather conditions and the improved Bimas and Inmas rice intensification programmes contributed to the highest rate of growth of fertilizer consumption (21 percent). In Ceylon it increased by 15 percent owing to greater use of nitrogenous and potassic fertilizers, while phosphatic fertilizers dropped further by one third. Total use

TABLE 2-34. – FAR EAST: CONSUMPTION AND PRODUCTION OF FERTILIZERS IN SELECTED COUNTRIES, 1969/70 AND 1970/71

		Consumption			Production	
		1969/70	1970/71	Change 1969/70 to 1970/71	1969/70	1970/71
		Thousand metric tons		*Percent*	*Thousand metric tons*	
Burma	N	15	15	—	—	15
	P	5	5	—	—	—
	K	5	5	—	—	—
Ceylon	N	49	58	+ 18	—	—
	P	8	5	— 33	—	—
	K	25	31	+ 24	—	—
India	N	1 360	1 487	+ 9	730	846
	P	420	462	+ 10	223	244
	K	209	228	+ 9	—	—
Indonesia	N	135	183	+ 36	43	45
	P	63	50	— 20	—	—
	K	10	18	+ 80	—	—
Korea, Rep. of	N	320	356	+ 11	356	386
	P	131	125	— 5	146	140
	K	84	83	— 1	—	—
Malaysia (West)	N	54	59	+ 9	31	26
	P	15	17	+ 13	—	—
	K	45	68	+ 51	—	—
Pakistan	N	357	352	— 1	174	177
	P	66	66	— 8	4	4
	K	11	12	+ 9	—	—
Philippines	N	101	119	+ 18	53	48
	P	64	69	+ 8	39	39
	K	38	38	—	—	—
Thailand	N	49	43	— 12	8	10
	P	45	36	— 21	—	—
	K	11	15	+ 36	—	—
Viet-Nam, Rep. of	N	99	70	— 29	—	—
	P	37	34	— 7	—	—
	K	17	19	+ 12	—	—
REGION [1]	N	2 920	3 153	+ 8	1 747	1 915
	P	1 005	1 080	+ 7	558	634
	K	572	632	+ 11	—	—

NOTE: N = Nitrogenous; P = Phosphate in terms of P_2O_5; K = Potash in terms of K_2O.

[1] Including the People's Democratic Republic of Korea and the Democratic Republic of Viet-Nam; excluding Japan.

[32] The need to remove various constraints which limit adoption of new varieties by small farmers is discussed in the section on agricultural employment and unemployment.

[33] In this connexion a farm research institute financed by the International Bank for Reconstruction and Development (IBRD), the United Nations Development Programme (UNDP) and the Food and Agriculture Organization of the United Nations (FAO) is to be established in India for research on sorghum, millet and pulses, and also for developing new crop systems which will help to improve agriculture in semiarid areas. For further information on breeding programmes see *The state of food and agriculture 1971*, p. 88, and earlier issues.

in the Philippines increased by 11 percent against 37 percent last year. In India, the rate of purchase of fertilizers slowed down in spite of more credit available to farmers through cooperatives and nationalized banks and greater area made over to both multiple cropping and high-yielding varieties. Consumption rose by 9 percent to 2.18 million tons, compared with 43 percent in 1968/69 and 19 percent in 1969/70. The National Commission on Agriculture in India made several recommendations for increasing fertilizer use, including analyses of requirements by an expert team on factors inhibiting growth in particular areas, streamlining of distribution, expanding fertilizer sales promotion and soil analysis programmes, and increasing credit facilities.[34] In the Republic of Korea consumption of fertilizer increased by 5 percent. It increased sharply in West Malaysia from 79 000 tons in 1966/67 to 144 000 tons in 1970/71. Consumption in Burma, Thailand, Pakistan and the Republic of Viet-Nam declined in 1971 as plantings were affected by adverse weather and, in the two latter countries, also by war.

The output of all fertilizers increased from 2.30 million tons in 1969/70 to 2.55 million in 1970/71, constituting about 52 percent of total consumption in these countries. Production of nitrogenous fertilizers went up by 10 percent to 1.92 million tons, and phosphatic by 13 percent to 634 000 tons. Imports of manufactured fertilizers declined from 2.19 million tons in 1969/70 to 1.90 million in 1970/71. The completion of a number of factories in India, Pakistan and other countries has increased availability, and Ceylon, Thailand and the Republic of Viet-Nam are planning to set up plants, while Indonesia expects to complete a large factory by 1973.

At present only a small proportion of farmers in these countries use chemical fertilizers. There are still large gaps between recommended dosages and actual applications, even for high-yielding varieties, in most countries. Among the constraints restricting fertilizer use, high prices and the lack of credit facilities are the most serious. The high cost of production in these countries makes price reduction impracticable. Paradoxically, the existing capacity of their fertilizer factories is not fully utilized. Only a few plants work at full capacity, and most utilize only 50 to 60 percent. The full utilization of existing plants and the modernization of old ones could lower prices, but further government support is required to establish effective distribution systems and to make fertilizers available on easy credit terms.

[34] During 1971/72, however, demand has picked up, and fertilizer consumption increased by 22 percent to 2.8 million tons in terms of nutrients.

Trade in agricultural products

The volume of agricultural exports from the developing countries of the region in 1971 increased by 7 percent, while export earnings went up by 4 percent, a slightly lower rate than that of the previous year (Table 2-35). Over the decade 1961-71, however, earnings for the region recorded the lowest rate of increase: 1.2 percent per year against 4.7 percent for world exports. The share of the developing countries of the Far East in world agricultural exports, therefore, declined from about 15 percent in 1961 to 10 percent in 1971. An analysis of their composition shows that although the total value of world exports for the 12 major agricultural commodities[35] increased by 47 percent during the decade, the share of these countries declined from 38 to 25 percent (Table 2-36). Sizable falls in the relative share occurred for rice (from 63 percent in 1961 to 33 percent in 1971), tea (from 91 to 79 percent) and copra (from 81 to 71 percent), and could not be offset by the region's increased share of world trade in palm oil, coconut oil, coffee and tobacco.

Export earnings from most commodities, except meat, coffee and rubber, were higher in 1971. Impressive gains were recorded for sugar, fruit and vegetables, tobacco, oil and oilseeds, cotton, live animals and livestock products (excluding meat).

Export earnings from sugar are estimated to have increased by 35 percent because of larger quantities (24 percent increase) shipped, especially from the Philippines and India, and the rise in world market prices owing to the continued expansion of world demand and a further shortfall in production in 1971/72. The export value of fruit and vegetables, which contribute 4 percent to total foreign exchange earnings, increased by 27 percent, with larger shipments of bananas (from the Philippines), oranges (from Pakistan), and potatoes and other vegetables.

The value of raw tobacco exports increased by 24 percent, reflecting larger sales by India, Indonesia and the Philippines, and higher unit prices.

Oilseed and oil exports rose in value by 19 percent, with larger earnings from copra and most oils, particularly palm oil. Copra exports, mainly from the Philippines, were higher in volume and value. Palm oil contributed about 78 percent of the increased earnings from oilseeds and oils. Greater shipments (principally from Malaysia and Indonesia) resulted from recent production developments and, together with higher unit prices, contributed to the 45 percent increase in total agricultural export earnings. Most other oils also showed small increas-

[35] Rice, maize, sugar, copra, palm oil, coconut oil, coffee, tea, tobacco, rubber, jute, oilseed cake and meal.

TABLE 2-35. – FAR EAST: [1] INDICES OF VALUE OF EXPORTS OF AGRICULTURAL PRODUCTS

	Share of total agricultural exports in 1971	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	Percent	..... *1957-59 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	103	105	107	111	116	+ 4
Food and feedstuffs	44	129	134	123	135	159	+ 18
Cereals	11	125	106	98	93	100	+ 8
Rice	7	106	86	76	68	70	+ 3
Sugar	11	108	117	111	127	172	+ 35
Oils and oilseeds	14	113	139	117	141	169	+ 19
Live animals and livestock products	2	142	181	266	269	302	+ 12
Fruit and vegetables	4	423	431	498	507	644	+ 27
Beverages and tobacco	22	111	104	94	107	114	+ 7
Coffee	3	202	185	212	252	212	— 16
Tea	12	91	83	70	78	83	+ 7
Tobacco	3	143	147	137	146	181	+ 24
Raw materials	34	81	84	102	96	87	— 10
Jute and kenaf	5	144	119	112	106	108	+ 2
Rubber	23	70	73	100	88	74	— 16
Cotton	4	116	152	98	171	193	+ 13

[1] Excluding Japan. China and other centrally planned countries. – [2] Preliminary.

es, due to slightly higher prices in 1971 and larger shipments.

A small rise in the volume of cotton exports, mainly from Pakistan, combined with higher prices due to the relative world shortage in 1971, resulted in a 13 percent increase in the region's export earnings.

TABLE 2-36. – FAR EAST: [1] SHARE IN WORLD AGRICULTURAL EXPORTS

Year	Total agricultural exports - value indices		Far East share in world	Export of twelve[2] major commodities - value indices		Far East share in world
	World	Far East		World	Far East	
	1960-62 = 100		*Percent*	*1960-62 = 100*		*Percent*
1960	98	104	15.6	100	104	37.9
1961	101	99	14.4	99	99	36.2
1962	101	97	14.2	101	97	34.8
1963	114	107	13.9	115	107	33.7
1964	124	106	12.6	122	105	31.2
1965	123	104	12.5	121	103	31.0
1966	126	101	11.8	121	99	29.7
1967	124	98	11.6	122	95	28.3
1968	126	100	11.7	127	94	27.0
1969	131	102	11.4	129	97	27.5
1970	151	106	10.4	145	99	24.7
1971	159	111	10.3	147	102	25.1

[1] Excluding Japan. China and other centrally planned countries. – [2] Rice. maize. sugar. copra. palm oil. coconut oil. coffee. tea. tobacco, rubber. jute. oilseed cake and meal.

Earnings from trade in live animals and livestock products, which account for 2 percent of the value of exports, rose by 12 percent. All items, except meat (which declined by approximately 4 percent), recorded significant increases: 30 percent for animal fat, 24 percent for dairy products and 18 percent for live animals.

The total volume of cereal exports from the region increased by 22 percent, while the value rose by about only 8 percent. Rice, maize and sorghum accounted for increased earnings. The volume of world rice trade increased by 10 percent, the bulk of the expansion originating in developing countries. However, the continued excessive export supplies on the world market and weak effective import demand led to the lowest level in international rice prices since 1960 (12 percent less than 1970), and the value of trade declined. Exports from the developing countries in the region increased by one fourth; those from Thailand increased by nearly one half and this country replaced the United States as the world's largest rice exporter. Exports from Burma also rose sharply, for the third year in succession. Despite the large increase in rice shipments from the developing countries of the region, value rose by only 3 percent as a result of low prices. Earnings from maize rose by 19 percent, with greater exports from Burma, Indonesia and Thailand due

to larger demand from Japan, and slightly higher prices. The increased volume of sorghum exports (up by 77 percent) also contributed to larger earnings from cereals.

The value of tea exports, owing to larger shipments mainly from India and Indonesia and higher unit prices, rose by 7 percent, compared with 11 percent in 1970. Although all exporting countries registered increases in their earnings, the biggest gain was in India, which became again the world's largest exporter of tea. Indonesia also exported more, but shipments from Ceylon were slightly lower than in 1970.

The decline in rubber prices which began early in 1970 continued throughout most of 1971 and, because of reduced demand in many consuming countries and overproduction of synthetic rubber, aggravated by uncertainties in Sino-Malaysian negotiations for rubber sales and the resumption of sales of United States stockpiles, prices reached their lowest level in 22 years. In spite of larger exports, earnings were thus almost 16 percent lower.

The value of coffee exports also declined by 16 percent, against a 19 percent increase the previous year. This was principally because of large reductions in exports from Indonesia, not compensated by greater exports from India.

According to preliminary data available, import demand for agricultural products increased at a lower rate compared with 1970 due to large grain harvests in some importing countries, slowdown of economic activity, disturbed conditions, and measures taken by some governments to restrict agricultural imports. These increased by less than 1 percent in volume and about 3 percent in value, reflecting higher import prices for all groups except cereals. The increase was mainly due to larger imports of sugar, oils and oilseeds, and cotton. Imports of fruit and vegetables, livestock and dairy products, tea and tobacco were also higher. Cereal imports, however, declined substantially; volume fell by 10 percent and value by about 15 percent. The reduction reflected increased domestic supplies in India, Indonesia and West Malaysia. Lower cereal imports in these countries more than offset increased imports by Bangladesh, Pakistan, the Philippines and the Republic of Korea, made necessary by poor harvests.

Regional economic cooperation

Following the fourth meeting of the Council of Ministers for Economic Cooperation at Kabul in December 1970, a preparatory meeting of 16 country representatives was held in Bangkok in March 1971 to further examine guidelines for setting up an Asian Clearing Union and to consider terms and conditions acceptable to the countries concerned.

The Association of South East Asian Nations undertook various studies during 1971 for the promotion of regional and subregional economic cooperation, including prospects for setting up joint industrial projects. In the field of agricultural exports, the Association of Natural Rubber Producing Countries, established in 1970 with Ceylon, Indonesia, Malaysia, Singapore, Thailand and the Republic of Viet-Nam as members, initiated a series of studies on problems and long-term prospects for natural rubber. Further progress was made in promoting activities of the Asian Coconut Community which set up its headquarters in Djakarta early in 1971. India, Indonesia and Malaysia concluded an agreement to establish a Pepper Community, membership of which would be open to all producing countries.

Development plans and policies

Most countries of the region have a formal development plan.[36] In 1972 new plans started in Ceylon, the Republic of Korea and Thailand. As reported in 1971, there is more interest in welfare objectives such as increased employment, and greater equity in the sharing of GDP. These objectives are now being argued as complementary rather than competitive to growth. All new plans reflect this tendency.

Ceylon's five-year plan defines the basic problems as unemployment, inadequate savings and foreign earnings for required investment, and unequal distribution of wealth. Although per caput income increased by 2.1 percent per year during 1959-69 unemployment amounted to 550 000 in 1971, or 12.5 percent of the labour force of 4.5 million. The unemployment situation is particularly harsh in the educated younger age group.

The gap in Ceylon's balance of payments has been widening. In 1969 and 1970 it exceeded Rs.1 100 million, equal to half the country's total annual foreign exchange earnings, contrasting sharply with the early 1960s when the deficit ranged between Rs.125 million and Rs.350 million. A fall

[36] Burma. *Four-year development plan, 1971/72-1974/75*. Rangoon. – Ceylon. *The five-year plan, 1972-76*. Colombo, 1971. – India. *Fourth five-year plan, 1969-74*. Delhi, Planning Commission, 1969. – Indonesia. *The first five-year development plan, 1969/70-1973/74*. Djakarta, 1968. – Japan. *New economic and social development plan, 1970-75*. Tokyo, 1970. – Republic of Korea. *Third five-year economic development plan, 1972-76*. [Seoul], 1971. – Laos. *Le Plan-cadre de développement économique; Lao, 1969-74*. [Vientiane], Commissariat au Plan, 1968. – Malaysia. *Second Malaysian plan, 1971-75*. Kuala Lumpur, 1971. – Nepal. *The fourth plan, 1970-75*. Kathmandu, 1970. – Pakistan. *The fourth five-year plan, 1970-75*. [Islamabad], Planning Board, 1970. – Philippines. *Four-year development plan, 1972-75*. Manila, National Economic Council, 1971. – Thailand. *Third national economic and social development plan, 1972-76*. Bangkok.

in both tea and rubber prices, a rise in import prices, together with failure to benefit from the rise in coconut prices due to a decline in production, all contributed to this situation. As to income distribution, the socioeconomic survey of 1969-70 showed that a wide disparity exists.

With these problems in mind, the plan lays down the following objectives: to bring about structural changes in the economy through investment in industry and agriculture based on nontraditional commodities and modernization of smallholding agriculture; to correct the balance of payments and increase employment; to decrease social and economic inequalities; to increase social overheads; to make rural society more attractive to young people by modernizing agriculture.

The plan's basic strategy consists of giving priority to labour intensive projects; minimizing the foreign exchange component of investment; diversifying agriculture to reduce food imports; utilizing idle industrial capacity; developing the export sector, giving priority to local projects.

Annual growth in GDP is planned at 6.1 percent and in per caput income at 4 percent, as population is expected to grow by 2.1 percent. Assuming a capital coefficient of 3.3 percent, investment required is put at about Rs.15 000 million, Rs.8 000 million of which is planned in the private sector. External sources are expected to provide 10 percent of investment. The average savings ratio will have to be raised from the present figure of 12.5 percent to about 17 percent of GDP and the marginal savings ratio to increase to 26 percent. Thus, out of the 4 percent per year increase in per caput income about 3 percent would be available for consumption. Exports are expected to grow at 6.2 percent per year.

Twenty percent of the plan investment is to go to agriculture (24 percent in the public sector and 17 percent in the private), which is expected to generate 28 percent of total growth in the plan period. Annual growth of the agricultural sector is planned at 4.9 percent (with tea at 2.8 percent, rubber 2.2 percent, coconut 3.5 percent and paddy 7.1 percent, annually), but its share of GDP is expected to decline from 36.3 percent in 1970 to 33.7 percent in 1976.

The plan aims to create 810 000 jobs, reducing unemployment from 12.5 percent to 5 percent of the labour force. Of this total, 300 000 (36 percent) would be created in the agricultural sector.

In India, the fourth plan (1969-74) midterm appraisal reveals that GDP in the first two years grew at an average annual compound rate of 5 percent (for 1971/72, it is estimated at 4 percent) against the target growth rate of 5.6 percent. Annual growth in the agricultural sector for the first two years of the plan was 5.2 percent (down to 3.8 percent in 1971/72), close to the target rate of 5 percent. Rates in the industrial sector amounted to 6.8 and 3.7 percent in 1969/70 and 1970/71 respectively (for 1971/72, 4 percent) against the target growth rate of about 8 percent per year.

Good harvests of foodgrains (a record 108 million tons in 1970/71) largely account for the satisfactory position of the agricultural sector in the first two years of the plan. The tempo could not be maintained in 1971/72 mainly because of natural calamities: drought in Maharashtra and Andhra Pradesh, floods in Uttar Pradesh, Bihar and West Bengal, and a cyclone in Orissa. The outbreak of hostilities on the subcontinent also had an adverse effect on agricultural production in some areas. On the input side, the target for the area under high-yielding varieties is expected to be fulfilled for wheat but shortfalls are expected in rice and grain sorghum. Progress in irrigation development and fertilizer consumption was generally below the plan targets. Foodgrain output is now expected to reach 122 to 125 million tons by 1973/74 against the original plan target of 129 million tons. Shortfalls in the production targets for fibres and oilseeds are expected to be relatively greater.

The midterm appraisal shows that there were shortfalls in the achievement of not only physical but also of financial targets. Outlays in the first three years of the plan amounted to half the total for the five-year plan period; therefore spending in the last two years has been revised sharply upward. Thus, the budgetary provision for the central plan proper (central and centrally sponsored plan schemes) is now expected to increase from Rs.14 550 million in 1971/72 to Rs.17 870 million in 1972/73, or by nearly 23 percent. Important increases are being made in those schemes which combine an element of social welfare with growth potential. The budgetary provision for the Small Farmers' Development Agency, marginal farmers and agricultural labourers, and special nutritional programmes for children, is double that in 1971/72. Programmes for dry farming development, rural works in drought-prone areas and the crash programme for rural employment are being continued in 1972/73 with a total provision of Rs.720 million.

The planning commission should bring out an approach paper for the formulation of the fifth plan (1974-79) by the end of September 1972. The draft outline of the fifth plan will be available in April 1973. It is expected to aim at the eradication of poverty, removal of unemployment, and price stability for goods for mass consumption.

A meeting of the National Development Council was held in May 1972 for a preliminary discussion on the approach and objectives of the fifth plan

and its probable magnitude. The approach paper is expected to deal with policy and resource implications for alternative rates of growth and other objectives such as employment, income distribution, regional balance, satisfaction of basic minimum needs, self-reliance, and so on. The formulation of the fifth plan is likely to involve the states more closely than before and on a more continuous basis.

In the Khmer Republic, the second five-year plan (1968-72) was abandoned in 1970 because of the war. However, the country continues to follow some general objectives, such as maintenance of productive capacity and reduction of the balance of trade deficit. Agriculture still has first priority and efforts are being made to diversify crops. Increased production is to be achieved through irrigation, water control, mechanization, use of fertilizers and pesticides, and through the more widespread provision of extension services and credit facilities to the peasants.

The third five-year plan (1972-76) of the Republic of Korea envisages an annual average growth rate of 8.6 percent for the plan period and a corresponding growth rate of 7 percent in per caput income. Primary objectives of the plan are the achievement of self-sufficiency in major foodgrains and higher incomes for farmers and fishermen; development of four major river basins and promotion of balanced regional growth; improvement in the international balance of payments through growth of commodity exports to 3 500 million won (U.S.$110 million) by 1976; construction of heavy and chemical industries; improved and fuller utilization of manpower through expansion of educational facilities and the development of science and technology; and a general improvement in the welfare of the people.

Although the growth potential of the economy may exceed the 8.6 percent envisaged in the third plan, this relatively low figure compared to the annual average growth rate of 11.6 percent during the second plan period (1967-71) is said to have been chosen in order to attain growth with stability. At the same time, it is related to the need for a better intersectoral balance by emphasizing the development of such low productivity sectors as agriculture and fisheries, small and medium industries, and marketing. Agriculture and fisheries are projected to grow by an annual average rate of 4.5 percent; the mining and manufacturing sectors by 13 percent; and social overhead and service sectors by 8.5 percent, as compared with 3, 20.6 and 13.2 percent respectively during the second plan period. Agricultural production, including foodgrains and other cash crops, will be increased through seed improvement, increased use of pesticides and fertilizer, expansion of irrigation facilities and mechanization. Modernization of the rural areas will include expansion of roads, electricity, communications and sanitation.

The contribution of agricultural and fishery sectors to GNP is expected to decline from 28.4 percent in 1970 to 22.4 percent in 1976.

Investment will amount to U.S.$142 million, which is 24 percent of total resources available during the plan period. Of this share for investment, 79 percent is expected to be financed by domestic savings and 21 percent by foreign savings, as against 62 and 38 percent respectively during the second plan period. Agriculture and fisheries are allocated 11.8 percent of total gross investment, mining and manufacturing 28.8 percent, and social overhead and other services 59.4 percent. Investment in the agricultural and fisheries sectors is expected to increase threefold compared to the previous plan.

The second Malaysian plan (1971-75), in addition to setting production targets in the agricultural sector also outlines strategies and programmes to eliminate the identification of race with particular forms of economic activity. High priority has again been given to improving the productive efficiency and income-earning possibilities of the smallholding rice farmers, predominantly Malays, who while forming a large and important rural sector have traditionally lagged well behind in their farming practices and living standards.

The plan has placed more emphasis on smallholding land settlement schemes mostly concerned with high-yielding plantation crops, notably oil palm and rubber. The target for settling 23 700 families on small farm units, developed and supervised by the Federal Land Development Authority, would have the effect of doubling the figure reached by this organization in the five years to 1970.

Programmes outlined to promote agro-based and other manufacturing plants and service industries in less developed areas demonstrate the Government's willingness to participate directly in pioneering new enterprises. The recently formed Majlis Amanah Ra'ayat (MARA) is equipped to provide financial and technical assistance to operators of new or existing enterprises. MARA also takes direct action to set up and develop new industrial, transport and commercial projects for transfer, at a later stage, to selected owner-operators.

During 1971 the continued downward trend in export earnings due to declining world prices for rubber, tin and timber was the main restraining influence on the economy and as such not fully offset by the growth occurring in the physical output of agricultural exports and further expansion in domestic demand generated in the main by public investment. As a result, GNP was estimated to have grown by 5 percent in 1971, representing a slowdown on the rates of growth achieved in the buoyant

years of 1969 and 1970 and falling short of the average annual rate of growth of 6.5 percent projected for 1971-75 in the second Malaysian plan.

Pakistan's fourth plan (1970-75) is being abandoned, according to unofficial sources, because of the present political situation. A two-year plan will probably be prepared to replace it.

Policies concerning population and employment are being formulated for the first time in Thailand's third plan (1972-76). It features the optimistic target of creating 2.6 million jobs by the end of the plan period. The plan also aims at reducing the rate of population growth from the current 3 percent per year to 2.5 percent. A substantial portion of employment is to be created in the rural sector on which much greater emphasis is put in contrast to the two earlier plans. Development expenditure in this sector will increase at a rate of 10 percent a year with the major aim of creating jobs, particularly by new infrastructure projects such as feeder roads and minor irrigation works. Processing industries will also be established in rural areas.

The GDP growth target has been set at 7 percent a year, compared with 7.8 percent achieved during the last plan. This lower rate reflects an expected decrease in foreign investment and falling prices for the country's major exports. The target for agricultural output is 5.1 percent a year compared to the 4.1 percent of the previous plan. Total plan outlay is 231 000 million baht: 100 000 million in the public sector and 131 000 million in the private sector. Of the public expenditure 12 percent is expected to be financed through foreign loans and 5 percent through foreign grants.

The plan hopes to increase nontraditional exports due to the limited possibility of increasing rice exports. The target for the export growth is put at 7 percent, while it is planned to hold down imports to 2.8 percent annually.

Agricultural employment and unemployment

There has recently been increasing concern with unemployment,[37] which has emerged as the critical problem in many developing countries of the region. A large section of the labour force is unemployed, while most of those who are engaged in agriculture, due to seasonal and disguised unemployment, remain grossly underutilized. A substantial and increasing number of people in these countries do not have even the bare minimum living standard. In addition, unemployment and poverty have dangerous political undertones. The widening of work opportunities is listed as one of the objectives in the national development plans of the developing countries. Targets suggested in the plans are summarized in Table 2-37. Generally targets are designed to cope not only with the increase in the labour force during the plan period but also to reduce part of the backlog of unemployment existing at the beginning of the plan.[38] However, in relation to the estimated increase in the economically active labour force, some countries have low targets for increase in employment. In fact, some of the plans, due to ignorance of the size of unemployment and underemployment and the very magnitude of the problem, envisaged job opportunities which were just sufficient to absorb the new labour force, or even less than this in some cases.

TABLE 2.37. – FAR EAST: EMPLOYMENT TARGETS IN THE DEVELOPMENT PLANS OF SELECTED COUNTRIES

Country	Period	Increase in labour force during plan period	Target employment increase	Sectoral distribution of employment targets		
				Agriculture	Industry	Services
		.. *Millions* ..		..... *Percent*		
Ceylon	1959–68	0.8	1.33	32.5	34.0	39.2
India	1956–61	11.8	9.4	21.3	35.1	43.6
	1961–66	17.2	14.0	30.0	27.8	42.1
Korea, Rep. of .	1962–66	0.85	0.73	54.0	26.1	19.8
	1967–71	1.17	1.28	34.4	28.1	37.5
Malaysia	1960–65	0.38	0.34	41.2	29.4	39.2
	1966–70	0.47	0.38	43.8	18.0	35.5
	1971–75	0.60	0.60	—	—	—
Pakistan	1960–65	4.1	2.6	53.8	26.9	19.2
	1965–70	4.7	5.5	45.0	55.0	
Philippines. . . .	1960–67	3.32	2.7	4.2	50.2	45.5
	1966–70		1.8	39.2	27.6	33.3
Thailand.	1967–71	2.30	2.2	48.1	17.0	34.9

SOURCE: Labour Force: International Labour Office, *Labour force projections*, Pt 1-V. Geneva, 1971. – National Development Plans.

The sectoral distribution of new jobs included in the plans shows a preponderance of the agricultural sector. India and the Philippines had in their earlier plans assigned relatively large shares to the secondary sector. This was reversed in later plans. Similarly, in Malaysia the share of the industry sector in the additional jobs was reduced from 29.4 percent in the first plan to 18 percent in the second, while the share of the agricultural sector was marginally increased. India, the Republic of Korea, Malaysia and the Philippines also relied heavily on the services sectors for creating additional jobs.

The worsening of the unemployment situation in these countries indicates that employment targets of development plans have not always been reached.

[37] Countries which have recently completed plans have, in their new plans, included detailed projects and schemes for employment creation, while others have taken up ad hoc employment schemes.

[38] These include the Republic of Korea, Malaysia, Pakistan and the Philippines.

Accomplishment has fallen short of forecast in a number of the countries.[39] It is increasingly felt that the problems of employment and the measures required for their solution have not received adequate attention. Until recently, employment in these countries was not a primary objective of planning and even less an essential component of development strategy. Employment needs to be made a development target with immediate priority. ILO has suggested a far-reaching revision of the development strategy hitherto adopted by the developing countries in the region.[40]

Owing to many social and economic difficulties the achievement of employment objectives in the developing countries is not easy. Employment in these countries could not increase quickly also because of a small increase in jobs in the industrial and other nonagricultural sectors. In fact studies have re-revealed that the capital-intensive technology pursued in the industries led to a decrease in employment per unit of output, thereby restricting the growth of employment potential in the manufacturing sector. This sector alone will not be able to absorb the fast increase in the labour force in these countries. According to a study conducted for IBRD, the absorption of only the increase in the labour force by non-agricultural jobs would require a rate of growth in GNP of over 10 percent a year,[41] which does not seem feasible for most of the countries in the region. In view of this situation a substantial increase in employment in agriculture is absolutely essential during the current decade at least.

PROSPECTS

The total labour force in the developing countries in the region increased from 635 million in 1960 to 763 million in 1970, while the share of agriculture declined during this period from 75 to 68 percent. In the same period, however, there was a net increase of 40 million workers in the agricultural sector, about one third of the total increase (Table 2-38). The worsening of the unemployment situation in most of the developing countries in the region indicates that the rate of increase of actual agricultural employment during 1960-70 was lower than the increase in the labour force.

During the 1970s the labour force in the region is projected to increase to 926 million. For quite some time the agricultural sector will have to continue to provide employment for an increasing number of people. According to recent projections this sector is expected to absorb one fourth of the new entrants during the decade. In addition, productive jobs will need to be created within the agricultural sector to absorb the backlog of unemployed and the considerable number of underemployed already existing in rural areas.

Possibilities of bringing more land under cultivation are limited except in a few countries such as Burma, Thailand and Malaysia. There seems to be reasonably good scope for increasing employment within agriculture through the adoption of intensive cultivation and by combining labour-intensive technology in certain stages with a capital-intensive technique in other stages. This cannot be easily achieved, however, unless appropriate policies are adopted for removing tenurial and other constraints, and measures taken which yield a maximum return on scarce land, and ensure productive employment for a large number of people.

The introduction and spread of new seed varieties offer the possibility of increasing simultaneously production, income and employment. The new varieties, because of the greater care required in pre-sowing operations as well as during the crop-growing season, larger application of inputs and higher yield, require on average 30 percent more labour per hectare.[42]

TABLE 2-38. – ASIA AND FAR EAST: ESTIMATES OF TOTAL AND AGRICULTURAL POPULATION AND THE LABOUR FORCE IN THE DEVELOPING COUNTRIES, 1960-80

	1960	1970	1980
	..... *Millions*		
Total population	1 459	1 830	2 300
Population dependent on agriculture	1 085	1 234	1 379
Agricultural population as percentage of total	*74.4*	*67.4*	*60.0*
Total labour force	635	763	926
Agricultural labour force.	475	515	554
Agricultural labour force as percentage of total	*74.8*	*67.5*	*59.8*

SOURCES: 1. United Nations. Population Division. *Total population estimates for world. regions and countries.* New York. 1970.
2. International Labour Office. *Labour force projections.* Pt I-V. Geneva. 1971.
3. FAO. *Monthly Bulletin of Agricultural Economics and Statistics.* 21(1). January. 1972.

[39] See Ceylon. *The five-year plan. 1972-76.* Colombo. 1971. – Malaysia. *Mid-term review of the first Malaysia plan. 1966-70.* Kuala Lumpur.

[40] International Labour Office. *Progress made with the Asian Manpower Plan: report presented at seventh Asian Regional Conference in Teheran. 1971.* Geneva. 1971.

[41] Singh. S.K.. *Aggregate employment function: evaluation of employment prospects in LDCs.* Paper for Basic Research Centre. International Bank for Reconstruction and Development. December 1969.

[42] Yudelman. M., Butler. G. and Banerji. R.. *Technological change in agriculture and employment in developing countries.* Paris. Organisation for Economic Co-operation and Development. 1971. p. 100.

In spite of the increased labour requirements — estimated at 25 to 35 percent for wheat and 40 to 50 percent for rice — the degree of labour intensity for the new varieties remained much lower than that practised, for instance, in Japan and Taiwan. Even after the use of farm machinery became widespread in the latter countries, 180 man-days per hectare were used in Japan in 1965 for the cultivation of one crop of rice, while in Taiwan the figure is estimated at 150 to 160 man-days per hectare. Against this, only 100 to 110 man-days per hectare were used for high-yielding varieties of rice in the Philippines and from 60 to 120 man-days for traditional varieties of rice in most countries of the region.[43] Several factors are responsible for this greater use of labour in Japan and Taiwan: the high proportion of irrigated area, larger application of inputs, greater care of crops, high prices for produce and higher yields.

In 1970/71 about 19.2 million hectares, which represents only 19 percent of the total area under wheat and rice in the region, were planted under these varieties.[44] There is increasing awareness of the need to promote the new varieties, especially among small farmers, for both economic and social reasons. In some countries measures are already under way for special schemes to help the small farmers.[45] The widespread use of new varieties by small farmers — as they are not likely to mechanize their production process in the near future — would lead to an increase both in employment of family labour and in the demand for hired labour. There is abundant evidence of greater labour intensity on the smaller farms and of higher productivity per hectare.[46] Raising the productivity of small farmers is, therefore, a prerequisite to increased employment. Effective measures to remove the constraints which the small farmers face are essential: inadequate tenure arrangements, lack of inputs, lack of access to marketing and credit facilities, etc., are all constraints which seriously limit their adoption of the new labour-intensive technology.

The short growing season of the new varieties also makes double- or multiple-cropping possible, which can lead to a significant increase in the demand for labour.[47] At present less than 5 percent of the area in the region is double-cropped.

The scope for extending area under high-yielding varieties is limited unless more land is brought under irrigation or more adaptable varieties are bred.[48] Intensified research is needed to evolve new technology for crops and livestock appropriate to the small farm, in particular rice under rainfed conditions, sorghums and millets for dry areas, pulses, labour-intensive cash crops such as cotton and other fibre crops, fruit and vegetables, dairying, small livestock. Similarly, soil conservation practices can create additional employment, while diversification of the cropping pattern will enable farmers to even out labour requirements during the year. Measures designed to place industries in rural areas, both for processing agricultural products and for providing inputs and resources for agriculture, could also create considerable alternative employment. An integrated strategy for rural development is necessary, incorporating intensive research and provision of inputs, combined with rural works and other programmes which ensure optimum use of available resources and greater employment opportunities.

However, the advent of mechanization which has accompanied high-yielding varieties lessens the prospects for increased employment. There is no doubt a need for proper and selective mechanization, especially for those operations which help raise crop intensity. In the short run this will lead to increased employment. As mechanization proceeds, it will displace labour. Various studies have drawn attention to the need to stem the mechanization taking place in these capital-scarce and labour-surplus economies and have suggested looking into policies relating to pricing of factors and products which are not always consistent with their supply. Capital and foreign exchange, according to these studies, seem to be underpriced in relation to their scarcity in many countries, while labour tends to be overvalued compared to its opportunity cost. It is felt that if the prevailing pricing system and special low-interest credit arrangements are continued, these will lead to labour-displacing mechanization which will accentuate the unemployment problem and increase migration to urban areas.

Absence of or exemption from taxation of agricultural income in most of these countries is also considered responsible for introducing capital-intensive

[43] Shaw, Robert d'A., *Jobs and agricultural development*. Washington, D.C., Overseas Development Committee, 1970. p. 90.

[44] U.S. Department of Agriculture. *Imports and plantings of HYV of wheat and rice in the less developed countries*. Washington, D.C., Foreign Economic Development Service, 1972.

[45] These include the Small Farmers' Development Agency scheme in India, two IBRD-financed irrigation projects in Malaysia under which a new approach is being developed to finance small rice farmers, and IBRD-financed projects in the Philippines for extending credit to small and medium farmers through rural banks. Other countries, such as Ceylon, Indonesia and the Republic of Korea, are providing inputs and institutional credit to farmers at lower than market rates.

[46] Productivity per hectare in the countries of the region which generally have small holdings, such as Ceylon and Malaysia, is higher than, for example, in Thailand and Burma where small holdings are less common and large farms relatively numerous. For yield per hectare see *The state of food and agriculture 1970*, p. 83.

[47] In the Pakistan Punjab input of labour per hectare on farms irrigated by tubewells were 57 percent higher than on unirrigated farms, which corresponded quite closely to the expansion of cropping intensity due to tubewells. Similarly, in Taiwan from 1915 to 1965 intensity of cropping rose from 132 to 198, the total amount of time worked doubled, while the number of agricultural workers increased by 50 percent and the number of days worked by each person increased by one third. cf. Shaw, Robert d'A., *op. cit.* p. 20-21.

[48] For area constraint, see *The state of food and agriculture 1971*, p. 87.

techniques. It is contended that the substantial profits made from new varieties have, in the absence of progressive land taxation and/or agricultural income tax, led to an agglomeration of land by large landowners who have also introduced mechanization on their farms.[49] There seems to be a case for the governments in these countries to devise effective policies to ensure that mechanization proceeds in an orderly and equitable fashion.

The strong deterrents to intensified cultivation existing in the land tenure system in many countries in the region also need to be removed. The insecurity of tenure and the share-cropping systems prevailing, even in those countries which have already passed legislation against them, leave hardly any incentive to undertake even simple improvements. The need for these measures is quite obvious and requires no emphasis. In addition, inequities resulting from the success of high-yielding varieties have underlined the need to reduce the size of the large holdings in these countries and to initiate effective land redistribution policies. In fact, some countries in the region have already initiated such policies. Their effective implementation together with the provision of inputs and necessary supporting services, particularly for small farmers, could lead to increased employment and output.

Rural employment programmes

In the past, policies and measures for achieving employment objectives included in development plans were generally not worked out in detail. However, in some countries, in addition to general agricultural development programmes, ad hoc production-oriented works programmes were undertaken for increasing alternative employment opportunities in rural areas. These programmes, designed to construct works of economic value by utilizing off-season labour, had a limited impact on employment.[50] Besides, due to managerial and administrative difficulties and physical constraints, the objective of increased employment could not always be attained. The Government of India had initiated a number of special labour-intensive schemes, such as a rural works programme, a crash scheme for rural employment and an agro-service centres scheme.[51] Difficulties in implementation and in the selection of suitable projects were reported. Ceylon and Pakistan have included similar schemes in their plans. In relation to the scale of unemployment the rural employment programmes fall far below requirements.

The scope for increasing employment and production in agriculture exists in most of the developing countries in the region. Table 2-39 shows the striking differences in input of agricultural labour and output per hectare in the developing countries, on the one hand, and in Japan on the other. According to a recent study, if the intensity of two workers per hectare prevailing in Japan could be attained in the developing countries which now have one worker per hectare, agriculture in Pakistan could absorb all the labour force expected by 1985, while in India the requirements for agricultural labour may exceed supply.[52] This level of labour intensity, however, is difficult to reach due to small irrigated area, absence of the necessary technology and the effective organization needed to supply finance and inputs to the numerous small farmers, and other constraints discussed above. The need for changes in government policies relating to services, prices, land tenure,

Table 2-39. – Far East: Agricultural labour force and agricultural production, 1970

Country	Agricultural workers per 100 ha	Indices	Net agricultural production per ha	Indices	Output per worker	Indices
		Japan = 100	*U.S.$*	*Japan = 100*	*U.S.$*	*Japan = 100*
Burma	48	25	71	9	148	37
Ceylon	107	56	286	38	266	67
India	92	48	115	15	150	38
Indonesia	224	117	283	37	126	32
Laos	153	80	119	16	75	19
Khmer Republic	75	39	146	19	194	49
Korea, Rep. of	261	136	440	58	169	43
Malaysia	74	39	366	48	492	124
Nepal	229	119	220	29	96	24
Pakistan	101	53	218	29	215	54
Philippines	113	59	178	23	158	40
Thailand	119	62	179	23	150	38
Viet-Nam. Rep. of	242	126	241	32	100	25
Average	103	54	159	21	155	39
Japan	192	100	762	100	397	100

Sources: Column 1: International Labour Office, *Labour force projections*. Pt I-V. Geneva. 1971. – Columns 3 and 5: FAO: Compiled from value of output calculated for the agricultural production index.

[49] Falcon. W.P.. The Green Revolution: generation of problems. *American Journal of Agricultural Economics*, Vol. 52, No. 5, December 1970.

[50] For instance. in East Bengal from 1962-67, the programme annually created additional jobs equivalent to 175 thousand man-years which represented a reduction in agricultural unemployment of only 3.4 percent. *Cf.* Thomas. John W.. *Rural public works and East Pakistan's development*. Cambridge. Mass.. Centre for International Affairs. Harvard University. 1968, Economic Development Report No. 112.

[51] For details see India. Ministry of Agriculture (Department of Agriculture). *Report 1970-71*, New Delhi. p. 175-181.

[52] Reutlinger. S. *et al.. Agricultural development in relation to employment problems*, Washington. D.C.. International Bank for Reconstruction and Development. 1971 (Draft).

mechanization and so on, has already been suggested and discussed. An ILO interagency team has suggested an integrated approach for full employment strategy for Ceylon and has made similar recommendations. The team felt that there was considerable scope for the greater use of labour in agriculture and other sectors.[53] These recommendations are relevant for most of the developing countries in the region where unemployment and underemployment have assumed serious proportions.

Increases in employment opportunities in rural areas will depend on the growth of agriculture and the technologies adopted. According to the FAO Indicative World Plan agricultural production in the developing countries of the region between 1962 and 1985 is projected to increase at the rate of 3.8 percent[54] against the 2.6 percent achieved during the last decade. With an estimated elasticity of employment to production of 0.3,[55] the increase in agricultural employment during the period 1970 to 1985 comes to 18 percent, which would suffice to absorb only the expected increase in the labour force. If the measures discussed above are followed, it may be possible to create additional jobs in the rural areas. There is need to increase elasticity by pursuing labour-intensive technologies. An elasticity of 0.5 would lead to an additional employment of about 10 percent, which could ease unemployment and underemployment in these areas.

JAPAN

In Japan, the GNP rose by about 11 percent in 1971 at current prices, or 6 percent at constant prices. Japan's rate of economic growth during 1971, although still one of the highest among developed market countries, was significantly below that of recent years and less than forecast. The impact of a cyclical reduction in investment was sharply intensified by uncertainties caused by the international financial crisis, imposition of the United States import surcharge, floating and subsequent revaluation of the yen, and external pressures for additional voluntary restraints on Japanese exports. The trade surplus was still larger in 1971 and Japan's international liquidity reserves tripled owing to massive inflows of speculative capital.

Agricultural production was again lower in 1971 (Table 2-32) as the slightly downward trend continued from the peak of 1968. Largely as a result of the government programme for reducing rice production (see below), crop production was lower (by 7 percent) for the third consecutive year and more than balanced increases in livestock production. The 1971 rice harvest was 14 percent below that in 1970 (and 25 percent below that in 1968) owing to an 8 percent reduction in area and below average yields (down by 7 percent) due to unfavourably cold weather in the northern regions. However, also the production of other cereals (wheat, barley and oats) was again lower in 1971 and amounted to less than half the 1968 figure. Fruit and vegetable output was higher by about 5 and 3 percent respectively, while that of most other crops was lower.

The long-term upward trend in livestock production continued in 1971 with a further 5 percent increase, but this rate of growth was less than half that in each of the two preceding years. Expansion of beef and veal production slowed down notably, with a rise of only about 6 percent, compared with 18 percent in 1970 and 35 percent in 1969. Greater slaughter of culled dairy cows accounted largely for the 1971 increase. Pork production was about 15 percent higher in 1971, compared with an increase of 24 percent in 1970. However, the number of pigs increased by almost 9 percent. Output of poultry rose by 8 percent. Rates of increase in the production of eggs (4 percent) and milk (1 percent) were below those of recent years. Dairy cattle numbers are estimated to have increased in 1971 but by a slightly smaller number than in 1970.

Trade in agricultural products

The level of Japan's foreign trade in agricultural commodities was again higher in 1971. The value of its agricultural imports, however, rose by only 4 percent, compared with 15 percent in 1970, and their overall volume index was slightly below 1970. Agricultural exports rose sharply, in terms of both volume and value, as shipments under the Government's rice disposal plan were increased to 920 000 tons (see below).

Upward trends in Japanese imports of grains and oilseeds were interrupted in 1971. Although wheat imports were again larger by about 5 percent, those of feedgrains were about 8 percent smaller than in 1970. Maize imports were lower by a million tons (17 percent) which more than offset small increases in imports of barley, oats and grain sorghum. Factors contributing to the decline in feedgrain imports included the increased use of domestically produced rice for feed and the disruption of shipments as a

[53] See International Labour Office, *Matching employment opportunities and expectation: a programme of action for Ceylon: the report of an inter-agency team*, Geneva, 1971.

[54] FAO, *Indicative World Plan for Agricultural Development 1975-1985 for Asia and the Far East: provisional regional study No. 4*. Rome, 1968.

[55] If it is assumed that all the agricultural labour force in the developing countries of the region (excluding China, for which reliable official figures are not available), which increased annually by 1.2 percent during the last decade, was absorbed, the elasticity comes to 0.5, which seems to be rather high. The more realistic figure would seem to be 0.3.

result of dock strikes in the United States. Imports of oilseeds were also lower, with the volume of soybeans 339 000 tons (10 percent) below the 1970 total. Sugar imports were slightly larger in 1971. Imports of cotton and wool were slightly below 1970 levels, largely reflecting the international financial crisis and related uncertainties concerning prospective export demand for Japanese textile products.

Japan's imports of livestock products were, however, generally higher in 1971. Beef and veal imports rose to 42 000 tons, almost double the 1970 total. Purchases of mutton and lamb and of pork, which had been reduced in 1970, increased to 127 000 and 21 000 tons respectively. Although imports of dried milk were notably lower, those of cheese showed a small increase.

Principal problems and policies

Agriculture was identified as one of the low productivity sectors of the economy in Japan's new economic and social development plan, 1970-75. The plan found that the difference between productivity and income in agriculture and other industries is likely to become greater unless effective measures are taken to modernize agriculture.

The plan called for the creation of large-scale farms, under both independent and cooperative management, in order to develop high productivity, and for a general reorganization of production and distribution to enable entire districts, including both independent farms and cooperatives, to function in a coordinated fashion. Revision of the farm land law in 1970 cleared the way for enlargement of farms by the consolidation of holdings and relaxed restrictions on the leasing of farm land. A five-year programme for the establishment of consolidated areas for the production of specific farm products (the agricultural block lands programme) is to begin during the current fiscal year (April 1972-March 1973). About 800 such blocks are to be established during the first year and a total of 10 000 blocks, containing 550 000 hectares, during the five-year period. Sizes of blocks are to vary according to the use to be made of them: 10 hectares for vegetables, 50 hectares for fruit, or 300 head of dairy cattle, or 1 000 head of beef cattle, and so on.

The 1970-75 plan also calls for adjustments in the supply of food products to conform to the changing pattern of consumer demand. Measures to achieve this include revision of current price policies and programmes to restore the influence of the market and to stabilize prices, rather than to provide supplementary income to farm households. The plan affirmed the necessity "to gradually reduce agricultural prices to the international level and, if necessary, to reappraise tariffs and other import duties from an international point of view." The Japanese Government took action to liberalize imports of a number of agricultural commodities during 1971 and 1972.

Within the general context of this plan, a major effort begun in 1970 has been the government programme to reduce its excessively large rice stocks (Table 2-40). These amounted at the end of March 1970 to 10.6 million metric tons (milled), of which about 5.9 million tons were considered to be surplus. The rice programme has consisted of measures designed to reduce rice production, to increase rice exports and to expand the domestic use of rice for livestock feed. With government payments for diversion of rice land to other crops or to fallow, the area planted to rice for the 1970 crop was below the 1967-69 average by about 11 percent (350 000 hectares) and rice production was also lower by the same percentage. Diversion payments continued for the 1971 crop and, in addition, the Government limited the quantity of rice that it would buy from producers at the guaranteed prices. As a consequence, with further reduced plantings and below-average yields, the 1971 crop was 7 percent below domestic food requirements. Rice exports, which had been negligible before 1969, rose sharply in 1970 and again in 1971. Most were made under concessional terms or as outright grants. They went mainly to the Republic of Korea. Domestic use of rice for livestock feed increased considerably during 1970/71 to about 250 000 metric tons (milled) from previous levels of about 25 000 metric tons per year.

The Japanese Government has also adopted a surplus rice disposal plan to eliminate its surplus stocks before 1975: about 1.8 million tons (milled) are to be disposed of in each of the two fiscal years (April-March) beginning in 1971/72; 1.3 million tons are to be used as feed, about 180 000 tons for industrial purposes, and about 360 000 tons are to be exported. The target for

TABLE 2-40. – JAPAN: SUPPLY AND UTILIZATION OF RICE

	Average 1966/67-1968/69	1969/70	1970/71	1971/72
	.... *Million metric tons (milled)*			
Beginning stocks (1 April)	8.6	12.5	13.9	13.7
Production	12.6	12.7	11.5	9.9
Imports	0.4	[1]	[1]	[1]
Domestic use	11.3	10.9	11.0	...
Exports	[1]	0.4	0.7	0.8
Ending stocks (31 March)	10.3	13.9	13.7	...

[1] Less than 50 000 metric tons.

1971/72 appears to have been met or even exceeded; feed industries have used roughly the planned volume of old crop rice and exports were significantly larger than the target of 360 000 tons.

PEOPLE'S REPUBLIC OF CHINA

In the absence of official data, analyses of the performance of China's agriculture are rather difficult. According to rough outside estimates the national income is estimated to have increased by about 10 percent in 1971. Agricultural production, which contributes about 40 percent to the GDP, also rose by 10 percent over 1970. Grain production, due to uneven weather, went up by only 2.5 percent to 246 million tons in 1971,[56] a record crop in terms of total output and yield per hectare. The increase reflected expansion of area, greater cropping intensity and higher yield per hectare due to better seed strains. According to FAO estimates, production of rice, owing to drought in a number of areas, is expected to have increased by only 2 percent to 104 million tons. Output of millet and sorghum rose by approximately 5 percent. The increase in centrifugal sugar was 4 percent. Output of oilseeds and tea was up slightly by 1 or 2 percent. Cotton and tobacco crops, owing to waterlogging in some areas and bad weather, registered no increase. Pig production, the most important branch of the livestock industry, was reported to have risen by 14 percent.[57]

China started its fourth five-year plan in 1971. Details have not been spelled out officially. During the year major emphasis was laid on consolidation. The basic guidelines for economic growth continued to be those first announced in 1969, namely: agriculture as the first priority, the simultaneous development of light and heavy industries, and the creation of integrated farming and industrial communities. In the farming sector, major importance continued to be given to modernizing farming systems and, since 1969, the highest priority has been given to large irrigation schemes in the slack periods of winter. Water conservation projects and other land improvement works also received much attention. According to rough estimates, irrigation on 50 percent of the arable area of about 109 million hectares has now been achieved.[58] In addition, greater emphasis is also being given to afforestation, flood control and other measures to combat waterlogging. Production of chemical fertilizer increased to 16.8 million tons,[59] a 20 percent rise over 1970. Of total fertilizers, 60 percent come from the small industry sector. A large share of these increased supplies are believed to have been applied to grain crops. There has been a great deal of emphasis in 1971 on a scientific approach to farming and on extensive experimentation in seed breeding. A number of teams have been encouraged to set up their own experimental plots. Institutions and special university courses have been established to train top agrotechnicians and to carry out scientific experiments. Mechanized farming is being introduced in stages. The more intensive cultivation techniques required by scientific farming and the demands of rural industry for workers affected the volume of labour available for tilling the soil. This provided the main impetus for the introduction of machinery on the land and made new arrangements essential in 1971 to free women from other work to take part in cultivation. Almost all the counties have set up plants to manufacture and repair farm machines. More than two thirds of the country's major administrative units had full-scale machinery industries. Local factories — mainly small ones — account for about 80 percent of all the farm equipment manufactured in China. The State has also built and renovated its own large plants.

In order to accelerate the process of transformation certain price adjustments were carried out during the later part of 1971, which made the terms of trade more favourable for the agricultural sector. Prices of inputs such as chemical fertilizers, insecticides, farm machinery, trucks, pumps, fuels and lubricants were reduced, while the procurement prices for commercial products such as sugarcane, groundnuts and oil-bearing crops were raised. After ten years of concentrating almost exclusively on grain production and criticizing peasants for shifting to more profitable crops, the importance of other products is finally being recognized and incentives redirected to these crops, and not just to rice and grain. In spite of the rapid increase in agricultural production during the past few years the total output remains insufficient to meet requirements. While the supply of grains seems to be assured, China has yet to achieve balance in its agricultural economy.

During 1971 there was a good deal of controversy between the central and provincial administrations regarding the abolition of all private rural property. Recognizing that rural progress is correlated with the cooperation of the farmers, in 1971 the Government approved the retention of private plots and subsidiary enterprises, as guaranteed by the draft constitution of 1970.

[56] For the first time in over a decade the Chinese Government announced grain production figures for 1971. Official data for other crops are not available.

[57] U.S. Department of Agriculture, *Foreign Agriculture*, February 28, 1972.

[58] *Journal of Commerce, New York*, October 12, 1971.

[59] This figure seems to be rather high. According to FAO data, fertilizer production in China in 1970 was estimated at slightly over 11 million tons, against an outside estimate of 14 million tons.

DEVELOPING COUNTRIES

The rate of economic growth has increased in most countries of the Near East, especially in those benefiting from larger oil revenues as a result of the recent series of agreements of the Organization of Petroleum Exporting Countries. Cyprus, at the end of its second five-year plan in 1971, saw all targets exceeded and an average growth rate of 8 percent achieved. Iran's GNP rose by 14 percent in real terms, a greater increase than in 1970, which was itself above the 9 percent target of the fourth development plan. The Libyan Arab Republic increased its GDP by some 16 percent in 1971, against an increase of less than 4 percent in 1970. The GDP of the non-oil sector rose by nearly 18 percent. In the Syrian Arab Republic, GDP increased by nearly 13 percent, considerably more than the second and third development plan target rates of 7 and 8 percent respectively, while Turkey achieved a growth rate of over 9 percent, the best since 1963 and higher than the second plan target of 7 percent.

In the countries of the region which had favourable weather in 1971 the agricultural sector made a large contribution to general economic growth, particularly in Turkey. In Cyprus, the agricultural sector maintained the target rate of an 8.5 percent annual growth in its GDP. In Jordan, agricultural production increased considerably but accounted for about the same proportion of GDP as the previous year, in view of the general economic recovery. In the Syrian Arab Republic, the GDP of the agricultural sector increased by 16 percent.

Agricultural production

Good weather enabled most countries in the Near East region to recover from the setbacks of the previous year, with the notable exceptions of Afghanistan, Iran and Iraq. As shown in Table 2-41 the preliminary 1971 index of total agricultural production for the region shows an increase of 3 percent over 1970, with a rise of 2 percent in the food production index. Thus, the upward trend in the region's agricultural and food production continued. This is attributed to a general, if varying, improvement of agricultural production in the region, favoured by the weather conditions of 1971.

The success of the region in 1971 largely reflects developments in Turkey and Egypt, where agricultural output increased by 7 and 4 percent respectively. These two countries normally account for nearly 50 percent of the region's production in agriculture. Afghanistan, Iran and Iraq again suffered from drastic rain shortage and showed decreases in total agricultural production of 5, 5 and 8 percent respectively, and even bigger decreases in per caput agricultural and food production. In Jordan, both agricultural and food production increased by some 30 percent, with the per caput production showing a matching increase. Cyprus, Lebanon, the Syrian Arab Republic and the People's Democratic Republic of Yemen each showed marked increases in total and per caput agricultural and food production.

The major commodities all show an increase in output over 1970. The recovery in grains was largely the result of good wheat harvests, especially in Turkey and Egypt, and regional production of wheat expanded by almost 16 percent to about 23 million tons, the highest output yet. Turkey, which normally produces some 50 percent of the region's wheat, had a record harvest and increased production by 35 percent. Iran and Afghanistan each had the poorest wheat harvest since 1965. Barley production amounted to 6.3 million tons, about 12 percent more than in 1970. An increase of some 28 percent in Turkey was mainly responsible for the regional increase, since about 60 percent of the region's barley is normally grown there. Iran produced slightly less in 1971. In Iraq and Afghanistan, output fell by 37 and 14 percent respectively. The region's maize output rose by nearly 6 percent to over 4.5 million tons, reflecting a modest increase in several countries. In nearly all countries the 1970 level was fairly closely maintained, but Afghanistan produced 5 percent less than in 1970. Rice production showed a slight increase and amounted to just over 4.5 million tons.

Horticultural crops increased very slightly. Vegetable production was just over 2 million tons, at about the 1970 level. Turkey, which normally accounts for some 45 percent of the region's output, produced about 2 percent less, but Egypt, which produces about one fourth, showed an increase of 3 percent. Production of fruit (excluding raisins and dates) was just over 10 million tons, a slight increase on 1970. Egypt again increased its output and now accounts for some 11 percent of the region's fruit production.

Output of livestock products in 1971 improved slightly. Regional production of beef and veal amounted to about 800 000 tons, thus continuing the unbroken upward trend since 1965. Turkey, Egypt and the Sudan, which together account for some 75 percent, produced rather more than in 1970. Despite drought, Iran, Iraq and Afghanistan

TABLE 2-41 – NEAR EAST: INDICES OF FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971[1]	Change 1970 to 1971	1967	1968	1969	1970	1971[1]	Change 1970 to 1971
Food production	..... *1961-65 average = 100*					*Percent*	..... *1961-65 average = 100*					*Percent*
NEAR EAST IN AFRICA	116	121	128	132	136	+ 4	105	106	110	110	111	+ 1
Egypt	109	123	124	126	131	+ 3	98	108	107	106	107	+ 1
Libyan Arab Republic	138	144	131	131	135	+ 3	121	122	108	103	103	— 1
Sudan	131	115	137	143	148	+ 4	117	100	116	117	119	+ 1
NEAR EAST IN ASIA	113	118	118	119	121	+ 2	102	103	101	99	98	— 1
Afghanistan	110	113	115	111	105	— 5	102	102	101	94	86	— 9
Cyprus	149	148	163	154	168	+ 9	142	140	152	142	155	+ 9
Iran	121	126	123	125	118	— 5	108	109	104	102	94	— 8
Iraq	114	138	127	121	112	— 7	99	116	103	95	85	— 10
Jordan	98	67	80	65	86	+ 32	87	58	67	52	67	+ 28
Lebanon	137	137	121	123	134	+ 9	122	119	102	100	106	+ 6
Saudi Arabia	111	111	114	116	118	+ 2	96	92	93	91	90	— 2
Syrian Arab Republic	108	97	109	82	94	+ 15	97	84	93	67	74	+ 11
Turkey	111	118	119	126	133	+ 5	100	104	102	106	109	+ 3
Yemen Arab Republic	97	94	95	102	102	—	89	84	83	87	85	— 2
Yemen, People's Dem. Rep. of[2]	103	99	117	110	121	+ 9	94	89	103	95	102	+ 7
Developing countries	114	119	121	123	126	+ 2	103	104	103	102	101	— 1
ISRAEL	132	138	137	142	147	+ 3	118	119	115	117	118	+ 1
Agricultural production												
NEAR EAST IN AFRICA	115	118	128	130	135	+ 4	103	104	110	109	109	+ 1
Egypt	107	119	123	124	129	+ 4	97	105	106	104	106	+ 1
Libyan Arab Republic	136	142	131	131	135	+ 3	119	120	107	104	103	— 1
Sudan	131	116	139	144	149	+ 4	117	101	118	118	119	+ 1
NEAR EAST IN ASIA	114	119	119	120	123	+ 3	103	104	101	99	99	—
Afghanistan	110	112	115	111	106	— 5	101	101	101	95	87	— 8
Cyprus	148	147	162	152	166	+ 9	141	138	150	141	153	+ 9
Iran	120	127	124	125	119	— 5	107	110	104	102	95	— 7
Iraq	114	137	128	122	112	— 8	99	115	104	95	85	— 11
Jordan	100	69	82	66	87	+ 32	88	59	69	54	69	+ 28
Lebanon	137	137	121	123	134	+ 9	122	118	102	101	107	+ 6
Saudi Arabia	111	111	114	116	118	+ 2	96	92	93	91	90	— 2
Syrian Arab Republic	103	96	107	86	97	+ 13	93	84	90	70	76	+ 9
Turkey	114	121	120	127	136	+ 7	103	107	104	107	111	+ 4
Yemen Arab Republic	97	94	94	101	101	—	88	84	82	86	84	— 2
Yemen, People's Dem. Rep. of[2]	101	93	114	108	119	+ 10	92	83	100	93	101	+ 8
Developing countries	114	119	121	123	127	+ 3	103	104	104	102	102	—
ISRAEL	134	140	140	145	149	+ 3	119	121	118	119	120	+ 1

[1] Preliminary. – [2] Formerly Southern Yemen.

produced about as much as in 1970 but suffered severe losses in livestock numbers. Regional production of mutton and lamb, estimated at over 900 000 tons, also followed the trend and increased slightly. Turkey, Iran, Afghanistan and the Sudan, which together account for 70 percent of regional production, all increased their output.

Production of cotton, the region's main nonfood crop and chief export earner, increased by 7 percent to 1.64 million tons. All the cotton-producing countries of the region, which the exception of Afghanistan and Iran, increased output and maintained, or resumed, the upward trend which started in 1966. Turkey increased production by 30 percent. Egypt and the Sudan, which together with Turkey account for some 75 percent of the region's cotton, increased production slightly. Iran, whose cotton production declined in 1970, showed a further large decrease in 1971.

Agricultural production in certain countries of the region was particularly affected by unfavourable weather. The prolonged drought in Afghanistan was the main cause of a further drop in 1971, and the fourth plan target of a 25 percent increase in all crops by 1972 has become increasingly difficult to attain. As in the previous year, the efforts of the Government to promote the use of high-yielding varieties and build up rural infrastructure, with particular attention to the improvement of small-scale irrigation, have been hindered. In Iran, the 1971 drought resulted in a shortage of grains and in heavy losses of livestock through lack of feed. Prices of grains for bread and feed doubled compared with the previous year despite heavy imports, but the consumer price of meat was maintained at the 1970 level. Iraq's grain crops also suffered badly from drought, and only rice output increased. Cotton maintained the 1970 level. However, livestock and livestock products showed some increase. Because of unfavourable weather, the Government's measures to improve agricultural production suffered a severe setback.

Most of the region's increase in agricultural production reflected improvements in Turkey and Egypt. In Turkey, because of unusually fine weather, the wheat harvest was exceptionally large and supplies covered domestic requirements, leaving a surplus for export or stocking. Increases in production were not only the result of good weather, but also of expanded areas, greater inputs and better cultivation practices, in particular for crops such as lint cotton, sugar beet and citrus fruit. Livestock production increased but there was less slaughtering and a shortage of meat occurred by the end of the year. A major policy change in 1971 with regard to agricultural production was the banning of opium poppy cultivation and a programme of assistance to former poppy growers. There were no basic changes in price support policies.

Egypt's record wheat harvest in 1971 owed much to the success of the locally-developed variety Giza 155, now used on more than two thirds of the wheat area. The cotton crop was also good. Changes were made in the institutional structure of Egypt's agricultural sector in 1971, with a view, among other things, to facilitating the extension of credit and subsidizing inputs to farmers.

Agricultural production in Jordan also benefited from favourable weather, and a general recovery from the disruptive conditions of 1970. Wheat production rose nearly fourfold and even greater increases were recorded for barley and lentils. Olive oil output more than doubled. Poultry production rose by 9 percent, but red meat production was slightly down. Farming is still held back by the unreliability of forage production caused by insufficient and uncertain water supplies. Legislation to control the use of land in low rainfall areas is under consideration.

Lebanon's agricultural production increased in 1971, partly because of the effort being made to diversify production. The citrus crop decreased, but other crops showed a substantial increase, the apple harvest being a record. Egg production increased by 12 percent and milk by 3 percent.

Shortage of rain affected agricultural production in the Syrian Arab Republic and so the output of wheat and barley, although greater than in 1970, was still well below the trend of the past five years. The output of cotton, most of the minor crops and livestock and livestock products all rose according to trends. In consequence of the continuing series of dry seasons, farmers' debts have been accumulating. A legislative decree was accordingly issued in March 1971 to ease the terms and extend the period of repayment of all loans, old or new, advanced by the Cooperative and Agricultural Bank and the Commercial Bank.

Trade in agricultural products

The volume of agricultural exports from the developing countries of the region is estimated to have increased by 2 percent in 1971, and the value by 12 percent (Table 2-42). Thus the position in 1970, when there was a large increase in volume but a small increase in value, was reversed. The volume was greatly affected by slightly smaller exports of cotton and considerably smaller exports of rice. Exports of the other main commodities — tobacco and fresh and dried fruits — increased in volume, as did exports of most of the less important commodities, with the exception of potatoes. These

TABLE 2-42. – NEAR EAST: [1] INDICES OF VALUE OF EXPORTS OF AGRICULTURAL PRODUCTS

	Share of total agricultural exports in 1971	1967	1968	1969	1970	1971 [2]	Change 1970 to 1971
	Percent	..... *1957-1959 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	124	129	137	144	162	+ 12
Food and feedstuffs	29	152	170	194	164	182	+ 11
Rice	4	261	383	468	290	209	— 28
Fruit	10	176	184	207	202	264	+ 31
Vegetables	3	191	155	179	202	200	— 1
Beverages and tobacco	8	114	94	87	91	99	+ 9
Tobacco	6	112	89	81	84	85	+ 1
Raw materials	63	115	119	123	148	168	+ 13
Cotton	61	117	123	127	152	172	+ 13

[1] Excluding Israel. – [2] Preliminary.

increases reflected the region's recovery in agricultural production in 1971. The big increase in value was the result of good prices for cotton, which again accounted for roughly two thirds of the region's export earnings. Prices were good also for certain fresh and dried fruits and for some less important export commodities, such as groundnuts, cottonseed oil, sorghum and sugar. For two of the most important export commodities — rice and tobacco — prices were the lowest since the early 1960s, so that earnings from these, compared with those from fresh and dried fruits, were of less importance than they had ever been. It would appear that fresh fruit is now established as a major export commodity of the region, and it may continue to surpass tobacco and become the second export earner of the region.

Cotton shipments from the region declined slightly, but their value increased by 13 percent. While exports from many producing countries were larger than in the preceding year of poor harvests, and above the 1966-70 average, there were sharp declines in the Syrian Arab Republic and Turkey. Turkey increased export earnings by some 17 percent, however, despite a fall of about 11 percent in the volume exported. Minimum export prices were maintained well above domestic prices to protect the local textile industry, and the export price of low quality cotton was only reduced when it was seen to be uncompetitive. Egypt's large increase in earnings was the result of the quality and type of cotton exported.

Exports of rice — mainly from Egypt — were down 20 percent in volume and 28 percent in value. Egypt had lowered its export target as a result of growing domestic needs and competition in the international market at a time of very low prices.

Tobacco shipments increased by some 9 percent in volume but very little in value in view of the severe price decline caused by limited demand for the region's oriental tobacco. Turkey, by far the biggest producer and exporter, made heavy sales of old stocks at greatly reduced prices.

Earnings from fresh and dried fruits increased considerably in 1971 to a record total. This was the result of bigger shipments of oranges at satisfactory prices, very high prices for lemons that more than compensated for rather smaller shipments, record shipments of dates at record prices, and good earnings by Turkey from raisins, where the quantity exported compensated for low prices. Egypt again led in orange exports from the region, although Cyprus nearly doubled its shipments in 1971 and Lebanon exported more oranges than ever before.

Vegetable exports increased slightly in volume and decreased slightly in value. A sharp drop in the price of potatoes and a reduction of about one third in their export from Egypt more than counteracted the large increase in volume and value of other vegetable exports, particularly from the Syrian Arab Republic and Turkey.

The region made record shipments and earnings in oils and oilseeds in 1971, a consequence of the large groundnut and cottonseed oil exports from the Sudan.

Imports of food products into the region were even greater than in 1970, again because of a poor year for agriculture in some countries, the effect of rising per caput income in others, and increasing population pressure. Cereals showed an increase of

35 percent in volume and nearly 40 percent in value, with more than 4.8 million tons of wheat, nearly 1 million tons of wheat flour, 800 000 tons of barley, and 300 000 tons of maize being imported. Egypt purchased nearly 2 million tons of wheat, a record, and Iran almost 1 million tons, 85 percent more than the 1968 peak figure. However, many countries reduced their wheat imports considerably. Barley was imported into Iran and Iraq for the first time in ten years and the Libyan Arab Republic increased its imports by 7 percent, while Cyprus and Lebanon reduced theirs by half. While Iran and Lebanon had record imports of maize, Egypt cut its purchases to less than the previous low level of 1969.

Imports of refined sugar rose by nearly 13 percent in volume but by over 50 percent in value. Although Iran and Iraq again reduced their imports, the Sudan imported 60 percent more than in 1970 to reach a record 200 000 tons and become the region's chief importer of this commodity.

In the livestock sector, imports of live animals rose about 30 percent in volume and even more in value. Live cattle imports were high, those of Lebanon increasing by 50 percent to 75 000 head. Live sheep, lambs and goats showed a very big increase, largely because Saudi Arabia, which accounts for nearly half the regional imports, increased the total of the preceding year by more than 50 percent to 1.7 million head, thus maintaining the high level of imports begun in 1968. The larger and more costly imports of meat were chiefly in beef and veal, amounting to about 25 000 tons. Kuwait and Iran together imported about 13 000 tons for the third year in succession and Egypt doubled the high figure of 1970 to 6 000 tons in 1971. Dairy product imports grew less than 8 percent in volume but over 22 percent in value, most of the countries having increased slightly their imports of butter, cheese and eggs, all at higher prices.

Development plans and policies

A number of development plans have been started and there have been substantial changes in the current plans of several countries in the region. Lebanon began a new plan in 1972 while Cyprus, Egypt and Jordan are finalizing plans to be launched in 1972 or 1973. Iraq increased its investment allocations and introduced certain changes in planning organization.

In the new six-year plan of Lebanon (1972-77) total annual investment will average 1 200 million Lebanese pounds, of which 290 million will be public investment. The plan envisages an annual growth rate in GDP of 7 percent, the rate achieved during 1964-69. The expected 4 to 5 percent growth rate in the agricultural sector by far exceeds the 2.5 percent reached in 1964-69 and it is doubtful whether this target can be fulfilled in view of the inadequacy of agricultural supporting services and the fact that yields from major irrigation projects will not be attained during the plan period. To help achieve the general objectives of increasing plant and animal production and improving farmers' productivity and income, the plan emphasizes the implementation of major irrigation projects, the expansion of the cultivated area and the strengthening of agricultural services and supporting activities. Particular attention will be given to the encouragement of silk production and agricultural mechanization and processing.

Cyprus completed its second five-year development plan (1967-71) and is now finalizing preparations for its third (1972-76). The agricultural production and export targets of the second plan appear to have been achieved, mainly because of the increase in irrigated area, the growth in domestic and export demand for agricultural products and the agricultural policy and development programmes of the Government. Out of the planned public expenditure of £C19 million on agricultural development more than £C16 million were actually spent, thus giving a high implementation ratio. However, the major problem that continues to confront agriculture is not only a question of increasing production but also of improving its competitiveness. The comparatively high costs and low yields of dryland farming and animal husbandry are caused by problems such as shortage of water, soil erosion, land fragmentation, the fallow system and seasonal shortage of workers. Improvements are needed in seed varieties and animal breeds, in methods of plant fertilization, animal feeding and in the marketing of agricultural products. Preliminary information on Cyprus's third plan indicates that it is essentially a continuation of the development effort begun under previous plans. In the agricultural sector, the main objectives will be higher returns from the various factors of production, the creation of competitive conditions for the marketing of increased production at remunerative prices, and reducing costs and raising yields. Gross agricultural output is projected to increase at an annual rate of 7 percent during the period 1972-76. Employment in the agricultural sector is expected to decrease and exports of agricultural and animal products should rise by about 11.2 percent per year.

In Egypt, a ten-year plan for 1973-82 is under preparation. This perspective plan, with a provisionally estimated total outlay of 7 500 million E pounds, will be divided into two five-year plans. In the agricultural sector, transformation of the tra-

ditional system is expected to raise agricultural output by 40 to 50 percent by 1982. Development projects, whether emphasizing vertical or horizontal expansion, will be designed to cope with the current problems of inadequate drainage, agricultural credit, marketing and cooperatives, and the fragmentation of holdings. Measures for the intensification of agricultural production will include tile drainage projects, the development of livestock, poultry and fisheries production, and the strengthening of supporting activities. New policy measures aimed at reducing the costs of production and expanding the use of high-yielding varieties are also planned.

Jordan is finalizing a three-year development plan (1973-75) for the East Bank. The new plan envisages an annual growth rate in the value of agricultural production of 6 to 8 percent. Its objectives are to satisfy domestic food demand, expand agricultural exports, increase rural employment and improve farmers' income. Emphasis will be on irrigation and land conservation projects, improved seed varieties, marketing, and development of animal husbandry. Consolidation of land holdings as well as expansion of agricultural credit and the improvement of the land-use pattern will also receive attention. Jordan abandoned its seven-year plan (1963-70) in 1967. But apart from the 1967 war, the occupation of the West Bank and the frequent disruptions of agricultural activities in the Jordan valley, a number of obstacles have impeded development. These include shortfalls in capital investments, shortages in technical staff and lack of coordination among the implementing agencies.

In Iraq, public investment during the current five-year plan (1970-74) was revised upward by 33 percent in view of the recent increase in oil revenues. Public investment allocations in agriculture increased from the 193 million I dinars originally planned to 344.5 million, thus raising the share of agriculture in public investment to 31 percent. The main objective of the plan continues to be expansion of agricultural output to meet domestic demand and expand exports. Problems to be overcome include inadequate drainage, inefficient utilization of resources, lack of trained staff and inadequate services. The plan places more emphasis than before on the improvement of services through the strengthening of extension, cooperatives, collective farms and farmers' unions. Particular importance is given to the development of drainage, the intensification of cultivation and the promotion of the use of fertilizers and improved seeds. Greater interest in perspective and regional planning in agriculture is reflected in the recent establishment of an office for long-term planning, and another for regional planning.

PATTERN OF INVESTMENT ALLOCATIONS IN AGRICULTURE

At present nearly all countries of the Near East have either short-term development programmes or comprehensive medium-term plans, and a few have perspective plans spanning over 10 to 15 years. During the last decade, the techniques of plan formulation have been improved considerably in the countries of the region and there are indications that the ratio of actual investment expenditures to planned allocations is rising.

The share of agriculture in total investment allocations varies from country to country as well as between the different plans of the same country. In some cases this share appears to be much less than the share of the agricultural sector in total output. This may indicate that agriculture is being developed with different degrees of capital intensity. Further analysis is required of this and of the relationship between investment in agriculture and agricultural output, but these are issues beyond the scope of this review.

Little information is available in national plans in respect of the pattern of investment in agriculture.[60] However, some broad generalizations can be made. A general characteristic has been for the public sector to assume major responsibility in developing agriculture. In a few countries, such as Cyprus, Iran, Jordan and the Sudan, the private sector has continued to play a significant role. In most countries the pattern of investment within agriculture is not being determined in isolation from the investment pattern of the whole economy. Interdependence between the two is particularly recognized in countries where agriculture has a prominent place in the total economy and contributes significantly to foreign exchange earnings. In these countries more attention is now given to the linkages between agriculture and the nonagricultural sectors. Among other things, the pattern of agricultural investment in each national plan reflects the stage of development of infrastructure in that country, particularly in those areas that are closely related to agricultural development.

Analysis of the distribution of total investment among the various subsectors of agriculture confirms the emphasis placed on agricultural infrastructure in most plans. In no country of the region is the pattern of investment devoted solely to dealing with urgent needs and shortages, although the immediate problems have always been of major concern.[61] Nearly all the national investment pro-

[60] See E.F. Szczepanik, *Agricultural capital formation in selected developing countries*, Rome, FAO, 1970, Agricultural Planning Studies No. 11.

[61] In Jordan, investments with long gestation periods, and those with rather indirect benefits such as agricultural research and education, have been given lower priority than those with more immediate and tangible results and whose contributions to increasing foreign exchange earnings are more evident.

grammes seek the creation of production potential for the future, in addition to making better use of the existing development potential. Such concern is reflected in the emphasis on large-scale irrigation and land reclamation projects. In the arid countries of the Near East the importance of irrigation water in this respect can hardly be overemphasized. Irrigation projects have not only contributed to the expansion of the agricultural capacity of the region but have also helped in reducing the excessive fluctuations in agricultural output. As large-scale and costly irrigation projects are necessarily slow-yielding, with gestation periods generally exceeding the duration of medium-term plans, they have been the main concern of the public sector. The share of irrigation and land reclamation projects in total public investment in agriculture in the current plans of some countries of the region is as follows: Iran, 50 percent; Iraq, 60 percent; Lebanon, 77 percent; Saudi Arabia, 34 percent; Somalia, 47 percent; the Syrian Arab Republic, 79 percent; Turkey, 55 percent; the People's Democratic Republic of Yemen, 64 percent. Irrigation was a major investment in earlier plans and no great changes in this pattern are apparent.

Investment in water and land resources development has also absorbed a substantial proportion of public investment in agriculture in other countries not included above. In Cyprus this proportion was 62 percent during the first plan (1962-66) and 55 percent during the second (1967-71). In Jordan's plan for 1963-70 it exceeded 73 percent and in the Sudan's 1961/62-1970/71 plan it amounted to 74 percent. In Afghanistan and Egypt it was 58 and 87 percent respectively.

In sharp contrast with this emphasis on the infrastructure of irrigation, drainage and land reclamation, relatively little attention has been paid to investment in the broad agricultural subsectors of crops, livestock, forestry and fisheries. The share of these in total public investment in agriculture in the current plan of Iraq is only 13 percent, Iran 11.5 percent, Lebanon 6 percent, and the People's Democratic Republic of Yemen 21 percent, but in Somalia it is about 50 percent, in Cyprus 39 percent and in Turkey 34 percent. Although livestock production in a few countries accounts for a large proportion of the total agricultural output the distribution of public investment in agriculture indicates that this subsector is being neglected. Lebanon's current plan, for example, allocates only 3 percent of its public investment in agriculture to livestock production and in the Sudan the corresponding figure is 3.3 percent. This neglect of livestock by the public sector reflects several factors, social, historic and economic. The nomad owners of livestock attach great importance to ownership in itself as a sign of wealth and influence, and they have been largely excluded from development efforts.

Improvement of agricultural institutions and services figures prominently in many plans in the region. Investment in supporting services such as agricultural research, extension, training, credit and marketing, although varying between countries, appears to be generally adequate. In a few countries, for example the Libyan Arab Republic and Saudi Arabia, supporting services have absorbed as much as 42 percent of total public investment in agriculture. In Iran, Iraq and Jordan their share exceeded 24 percent.

In a few plans more investment is being given to mechanization, rural employment activities and regional development projects. The latter aspects are particularly emphasized in the plans of Iran, Iraq, the Sudan and the Syrian Arab Republic. Mechanization, by reducing the need for draught animals, should provide an opportunity for substantial increases in meat production. Transport and road construction and agricultural processing industries continue to be omitted from investment in agriculture.

Thus, the pattern of development expenditure in Near East countries has emphasized a variety of measures which all aim at the optimum use of agricultural resources in accordance with the medium and long-term objectives of their plans. Although investment in infrastructure should be a careful choice of both quick and slowly maturing projects that will build up the long-term production potential of the economy, some countries in the region have failed to strike such a balance. In these same countries also the difficult question of sequence and coordination in investment in agriculture has not received the attention it deserves.

Agrarian reform

The 1950s and 1960s may be called the decades of land reform and the emancipation of the fellaheen in the Near East region. Agrarian structural changes effected in most countries of the region have differed depending on their stage of social and economic development. While most share a common cultural and institutional heritage, they vary considerably in their land tenure systems, water and oil resources and population pressure on agricultural land, as well as in economic systems and ideologies which influence their choice of agricultural development strategies.

Land reform plays an essential role in rural development — in the removal of institutional barriers to agricultural development, the creation of a new social order, and the redistribution of income with the consequent increase in demand for consumer goods and the acquisition of production inputs.

This role is particularly relevant where land is the major source of the gross national product and employment as in Egypt, Somalia, the Sudan, the Syrian Arab Republic, and both the Yemen Arab Republic and the People's Democratic Republic of Yemen. It is also relevant in countries that enjoy high oil revenues but where agriculture provides employment for nearly 50 to 60 percent of the total population as in Iran, Iraq, the Libyan Arab Republic and Saudi Arabia. This concern has been expressed by national leaders in announcing land reform plans, as well as in the preambles of land reform laws. These speak of abolishing feudalism and associated absentee landlordism, extreme income inequalities and social discontent among rural populations. The motive is to provide incentives and opportunities to landless farmers to own and cultivate land, expressed in laws enacted in Egypt (1952 and 1961), Iran (1962), Iraq and the Syrian Arab Republic (1958), the People's Democratic Republic of Yemen (1968), and in the expropriation of expatriate landlords in the Libyan Arab Republic in 1970.

This radical approach to reforming the traditional land tenure system covers the confiscation of estates, placing a maximum limit on individual land ownership, expropriating land exceeding this limit, redistributing it among the actual farm workers, and fixing rental values below market value. The maximum size of units allotted to new owners and the rental values vary from country to country according to land values, population pressure, and whether the land is cultivated under irrigation or rainfall.

All these structural changes were designed to reform the land tenure system radically at the national level. But some countries, such as Jordan and the Sudan, have undertaken a reform of land tenure by projects in certain areas: in the East Ghor canal zone in Jordan (1962), and in the Sudan in the taking over by the Government of the management of private pump and tractor schemes in the interests of the actual cultivators. Other countries of the Near East – Afghanistan, Lebanon and Saudi Arabia – have followed a policy of laissez-faire in land tenure. Afghanistan and Saudi Arabia have established small-scale land settlement schemes, and Lebanon has consolidated fragmented holdings on a voluntary basis without intervening in the tenure system.

Any assessment of these programmes should be regarded in the context of each country's situation. The promulgation of a land reform law does not guarantee that its objectives will be achieved or its role in rural development accomplished. Experience in the region has shown that the intention in making the law is one thing and the reality of achievement another. For instance, implementation of Iraqi land reform in its first five years (1958-63) indicates that a land redistribution programme does not automatically succeed in achieving the aim of increasing production, due to serious implementation difficulties: lack of personnel, need to construct a network of irrigation and drainage systems and to provide the beneficiaries with such supporting services as credit, cooperatives, extension assistance and marketing. This integrated approach to land reform was effectively carried out in Egypt, the Syrian Arab Republic and Iran. In these three countries, and recently in Iraq as well, implementation took place in a context of resolute will on the part of the governments and dynamism in the programmes. The Egyptian programme did not only reform the land tenure system, but also reorganized crop rotation, credit, cooperative and marketing systems, and brought trading in the main crops under state control. The reform of the three components — the land tenure system, the production system and the supporting services system — in the agrarian structure is significant in achieving not only the social but also the economic aims of better income distribution and increased production.

Apart from reducing extreme inequality in the pattern of land ownership and abolishing absentee landlordism, land reform in distributing equally small holdings can be economically justified on employment grounds. Given the limited quantity of land and the number of people it must absorb, the fixed size of holding for the utilization of the maximum amount of labour resources cannot always suffice, and the question of joint operation of small holdings in large production units becomes relevant, as in Egypt and Iran. This is a fundamental question in implementing land reform. The problem faced by governments has been how to establish an institutional structure which would hold and employ the residual population until alternative employment opportunities become available.

Studies of this problem and the effect on income levels of increasing population in land reform areas are necessary. Similarly there is a scarcity of objective studies and facts about the changes that have taken place in social organization, income distribution, employment and productivity. National universities and research institutions in the Near East have a significant role to play in this much needed inquiry.

ISRAEL

The GNP in Israel was higher in 1971 by about 20 percent at current prices, or 7 percent at constant prices. The index of consumer prices averaged 12 percent higher as inflationary pressures persisted. Imports and exports both increased by roughly 25

percent and the trade deficit widened correspondingly. However, continued capital inflows enabled further recovery in the country's international liquidity reserves, which rose to the early 1967 level.

The upward trend in agricultural production continued in 1971, with a further increase of about 3 percent (Table 2-41). The wheat harvest was 60 percent bigger than in 1970 and the second largest on record as a result of greater use of high-yielding varieties, ample rainfall and increased irrigation. Production of citrus fruits was again higher, although that of most other fruits showed little change. Vegetable production again increased as the longer term upward trend continued. Poultry production was higher by 3 percent. Production of other meats showed little change. The upward trend in milk output continued with a further increase of 3 percent.

Prices received by farmers were 14 percent higher, with citrus prices averaging above the depressed 1970 level. The index of prices of agricultural requisites averaged about 12 percent higher, with further wage rises a major factor in the increase.

A five-year plan for the development of Israeli agricultural production during 1971-75 has been completed by the Ministry of Agriculture. The plan calls for continued improvement of technology and an increase in the area under intensive cultivation for export. The total value of agricultural production (at 1969/70 prices) planned for the 1975/76 season is 41 percent above the 1969/70 base level. Agricultural land area is to be increased by 7 percent, capital investment by 24 percent, labour inputs by 7 percent, volume of water used by 4 percent, and farmers' net income by 50 percent.

The value of agricultural exports, at 1969/70 prices, is to increase by about 70 percent, with a somewhat larger increase in processed than in fresh produce. The plan foresees a 23 percent increase in citrus production based on young groves reaching full production and improved productivity of existing groves. During the period, new plantings are to be made of 4 700 hectares of citrus, mainly grapefruit and tangerines, and 3 750 hectares of avocado and other subtropical fruits for export. The greenhouse area devoted to flower production is to be almost doubled, with exports of flowers to be tripled. Output of vegetables is to be increased by 31 percent and their export value to be tripled.

Trade in agricultural products

Israel's foreign trade in agricultural commodities was generally larger in 1971. The volume of imports rose slightly and their value was higher by 4 percent; but the increase was notably smaller in both volume and value than in 1970. The volume index for exports was 12 percent lower, but the value was 9 percent higher.

With increased domestic production, wheat imports were lower in 1971 by about 25 percent. However, imports of feedgrains were up by almost 5 percent, with grain sorghum accounting for most of the increase. Sugar imports were also larger, as were those of oilseeds (mostly soybeans) and vegetable oils (mainly soybean oil). Meat imports, principally of beef, dropped sharply in terms of both volume and value. In contrast, imports of dairy products (mostly dried milk) were higher by 67 percent in volume and 92 percent in value.

Exports of citrus (oranges and lemons) were smaller by 9 percent in volume but, with prices in European markets significantly above the depressed level of 1970, value was higher by 16 percent. Cotton exports were smaller by almost 50 percent in volume and, with higher prices, by 40 percent in value.

Africa

DEVELOPING COUNTRIES

Few figures are available on GDP growth in the developing countries of Africa for 1971. Nigeria's GDP increased by some 10 percent at current prices, due mainly to greater oil production, and in Tunisia and Ivory Coast it increased by 8 percent largely as a result of good harvests. In Kenya, Liberia, Morocco and Zaire the GDP grew by some 5 percent. For Zaire this was a drastic fall, a consequence of the decline in world prices for copper, which accounts for more than half the country's foreign earnings. Mainly for the same reason, Uganda's GDP was down by 2 percent and Zambia's foreign earnings decreased substantially. For many countries in the region, exports of mineral products remain the most important source of foreign exchange earnings, and some countries may legitimately expect to finance their overall development by these exports. Algeria, for these reasons, nationalized its oil industry, and Nigeria's fast recovery after the civil war is based on an increase of oil exports, which accounted for 72 percent of total exports in 1971 compared with 58 percent in 1970. Other countries hope to discover oil within their boundaries, and substantial research funds are being spent in Congo,

TABLE 2-43. – AFRICA: INDICES OF FOOD AND AGRICULTURAL PRODUCTION

	Total						Per caput					
	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971
	..... *1961-65 average = 100*					*Percent*	..... *1961-65 average = 100*					*Percent*
Food production												
NORTHWEST AFRICA	100	129	111	122	134	+ 10	91	113	94	101	107	+ 7
Algeria	92	110	101	108	114	+ 6	83	96	86	89	92	+ 3
Morocco	109	152	123	136	147	+ 8	98	132	104	111	117	+ 5
Tunisia	95	102	97	115	141	+ 23	88	92	84	94	112	+ 20
WEST AFRICA	105	101	107	108	111	+ 3	94	89	91	89	89	—
Dahomey	105	97	93	100	105	+ 5	93	84	78	82	84	+ 2
Gambia	108	122	114	114	114	—	100	111	101	99	97	— 2
Ghana	112	105	111	119	122	+ 3	101	92	95	99	99	—
Guinea	103	107	112	116	117	+ 1	93	93	95	96	95	— 2
Ivory Coast	122	124	132	135	143	+ 6	107	105	109	108	111	+ 3
Liberia	100	101	101	102	102	+ 1	94	93	91	90	89	— 1
Mali	108	101	110	104	116	+ 11	100	92	98	91	100	+ 9
Mauritania	109	111	116	115	117	+ 1	102	101	103	100	100	— 1
Niger	119	113	120	117	118	+ 1	107	99	102	97	95	— 1
Nigeria	97	95	101	103	103	—	87	82	85	84	82	— 3
Senegal	116	96	104	83	107	+ 30	107	87	91	72	91	+ 28
Sierra Leone	120	118	117	122	125	+ 3	113	110	107	111	112	+ 1
Togo	126	130	134	132	134	+ 1	115	115	116	112	111	— 1
Upper Volta	108	108	105	107	108	+ 1	101	98	93	93	92	— 1
CENTRAL AFRICA	113	124	122	124	129	+ 4	105	113	109	109	111	+ 2
Angola	111	123	129	132	135	+ 2	105	115	120	120	122	+ 1
Cameroon	123	126	119	122	128	+ 6	113	114	105	105	109	+ 3
Central African Republic	104	106	106	108	113	+ 4	96	95	93	93	95	+ 2
Chad	95	101	99	98	103	+ 5	89	94	90	88	91	+ 3
Congo	86	82	88	89	96	+ 8	81	76	81	81	86	+ 6
Gabon	116	119	122	126	130	+ 3	112	113	115	117	120	+ 2
Zaire	117	137	134	136	141	+ 3	108	123	118	117	118	+ 1
EAST AFRICA	113	116	123	129	131	+ 2	103	103	107	109	108	—
Burundi	114	115	133	161	158	— 2	105	105	118	140	135	— 4
Ethiopia	110	113	117	120	123	+ 2	102	103	103	104	104	—
Kenya	110	118	123	124	127	+ 2	98	102	104	102	101	— 1
Madagascar	113	117	120	120	123	+ 3	103	104	105	102	102	—
Malawi	137	126	139	126	139	+ 10	123	110	118	103	110	+ 7
Mauritius	109	102	113	99	106	+ 7	99	91	99	85	89	+ 5
Mozambique	107	114	111	117	119	+ 1	102	107	102	106	106	—
Rhodesia	109	105	116	106	118	+ 11	96	89	96	85	92	+ 8
Rwanda	122	126	130	138	138	—	108	108	108	111	108	— 3
Somalia	109	113	116	117	118	—	100	101	102	100	98	— 2
Tanzania	115	122	138	171	169	— 1	104	108	119	143	138	— 4
Uganda	109	114	120	120	121	+ 1	99	100	103	101	99	— 1
Zambia	138	119	134	124	149	+ 20	122	102	111	100	116	+ 16
SOUTHERN AFRICA	105	109	108	107	119	+ 12	94	95	92	88	95	+ 9
Botswana	99	118	116	108	150	+ 39	88	102	97	87	118	+ 36
Lesotho	100	105	98	87	104	+ 20	89	91	82	71	83	+ 16
Developing countries	108	113	115	119	123	+ 4	98	100	99	100	101	+ 1
SOUTH AFRICA	138	119	125	129	148	+ 15	126	106	109	109	123	+ 12

[1] Preliminary.

TABLE 2-43. – AFRICA: INDICES OF FOOD AND AGRICULTURAL PRODUCTION (*concluded*)

Agricultural production	Total						Per caput					
	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971	1967	1968	1969	1970	1971 [1]	Change 1970 to 1971
	1961-65 average = 100					Percent	1961-65 average = 100					Percent
NORTHWEST AFRICA	101	129	112	123	135	+ 9	91	113	95	101	107	+ 6
Algeria	93	111	103	110	116	+ 6	84	97	87	91	93	+ 3
Morocco	109	151	123	136	147	+ 8	98	131	104	111	117	+ 5
Tunisia	96	103	98	115	140	+ 22	89	93	85	94	112	+ 19
WEST AFRICA	106	102	108	109	112	+ 3	95	89	92	90	90	—
Dahomey	106	99	96	104	111	+ 6	94	86	81	85	88	+ 4
Gambia	108	122	114	114	114	—	100	111	101	99	97	— 2
Ghana	112	105	111	119	122	+ 3	101	92	95	99	99	—
Guinea	103	106	111	115	115	+ 1	92	93	95	95	93	— 2
Ivory Coast	129	119	135	131	137	+ 4	113	102	112	105	107	+ 1
Liberia	111	113	115	122	121	— 1	104	104	105	108	106	— 2
Mali	109	103	112	107	119	+ 11	101	93	100	94	103	+ 9
Mauritania	109	111	116	115	117	+ 1	102	101	103	100	100	— 1
Niger	119	113	120	117	118	+ 1	107	99	102	97	96	— 1
Nigeria	97	95	101	104	103	—	86	82	85	84	82	— 3
Senegal	116	96	104	83	109	+ 31	107	87	92	72	93	+ 28
Sierra Leone	119	117	116	123	125	+ 2	112	109	107	111	112	—
Togo	124	130	133	132	134	+ 1	113	115	115	111	110	— 1
Upper Volta	109	110	107	109	111	+ 2	102	100	96	95	95	—
CENTRAL AFRICA	114	124	123	124	129	+ 4	105	113	110	109	111	+ 2
Angola	116	118	126	127	131	+ 3	110	111	116	115	118	+ 2
Cameroon	126	130	125	125	133	+ 6	116	118	110	109	113	+ 4
Central African Republic	106	109	111	111	115	+ 4	98	99	97	96	97	+ 1
Chad	97	107	101	99	105	+ 5	91	99	92	90	93	+ 4
Congo	87	83	89	90	97	+ 7	82	77	82	82	87	+ 6
Gabon	115	118	121	125	129	+ 3	111	112	114	116	118	+ 2
Zaire	115	134	132	134	138	+ 3	105	120	116	115	116	+ 1
EAST AFRICA	113	115	123	129	131	+ 2	103	103	107	109	108	— 1
Burundi	115	116	132	161	159	— 1	107	105	117	140	136	— 3
Ethiopia	114	117	120	123	126	+ 2	105	106	106	106	107	—
Kenya	111	118	125	128	130	+ 1	99	102	105	105	103	— 1
Madagascar	114	117	120	119	122	+ 3	104	104	105	102	102	—
Malawi	132	121	133	127	140	+ 10	119	106	113	104	111	+ 7
Mauritius	110	104	116	101	109	+ 7	100	93	101	87	92	+ 5
Mozambique	109	116	115	121	120	— 1	104	108	105	110	107	— 2
Rhodesia	105	94	106	99	108	+ 9	93	80	88	80	84	+ 5
Rwanda	122	127	132	139	139	—	108	109	110	113	109	— 3
Somalia	109	113	116	117	118	—	100	101	102	100	98	— 2
Tanzania	115	119	133	160	159	— 1	105	105	115	134	130	— 3
Uganda	109	113	126	124	123	—	99	100	109	104	101	— 3
Zambia	133	117	130	121	145	+ 20	118	100	108	97	113	+ 16
SOUTHERN AFRICA	105	110	107	107	118	+ 11	93	96	91	88	95	+ 8
Botswana	99	118	116	108	150	+ 39	88	102	97	87	118	+ 36
Lesotho	101	106	99	90	105	+ 17	90	92	84	74	84	+ 14
Developing countries	109	113	116	120	124	+ 3	99	100	100	100	101	+ 1
SOUTH AFRICA	134	118	124	124	141	+ 13	122	105	107	105	117	+ 11

[1] Preliminary.

Madagascar, Gabon and Zaire for off-shore drilling, with some success in the three former countries. Mineral ore is becoming an increasingly valuable source of foreign currency, as in Niger (uranium) and Ivory Coast (iron). On the other hand, diamond production and exports were down in Sierra Leone and the Central African Republic.

Cooperation among African states in agricultural matters may well increase in view of the United Kingdom's entry into the European Economic Community. The Yaoundé and Arusha Conventions, tying the East African Market Association to EEC, are likely to attract new members. Mauritius has already attained associate status in spite of the difficulties presented by the special arrangements for its sugar industry granted under the Commonwealth Sugar Agreement. Similar problems will have to be solved for other Commonwealth countries in Africa. In west Africa, the Organisation des Etats riverains du Sénégal was reorganized with the membership of Mali, Mauritania and Senegal only.

Agricultural development is given more attention each year and in many African countries is the top development priority, particularly where food deficits are becoming worse: as much as 20 percent of the value of total imports of certain countries in the region is for food. This situation arises mainly from urbanization and population increase. Prices of staple foods are rising rapidly in many countries because of scarcity and the consequent need for imports, particularly in Nigeria and Madagascar. However, other factors influence price levels, including higher producer prices for many agricultural products in 1970 and 1971. These were granted to offset the general inflation, to raise farm incomes, extremely low and mainly unchanged compared with urban income, and to offer incentives for greater output. Thus, prices were increased for coffee in Madagascar and Kenya, for groundnuts in Senegal, cocoa beans in Ghana, paddy in Sierra Leone and wheat in Morocco.

Self-sufficiency in food products and diversification in exports are being stressed throughout the region. An important effort is also being made to expand agro-allied industries.

Agricultural production

Agricultural and food production in developing Africa rose by 3 and 4 percent respectively in 1971, with increases in all subregions (see Table 2-43). Among the major crops contributing to this expansion were grains — particularly wheat, barley and maize — sugar, groundnuts and palm oil.

In many countries the growth of agricultural production has not kept pace with population increase. In 16 of the 39 countries of developing Africa listed in Table 2-43, per caput agricultural production in 1971 was below the 1961-65 average, and of these 16 only 7 had reached this level in the intervening period. In several countries per caput levels have even shown a clear downward trend. The development of the agricultural sector has therefore become a basic feature of government policies of most countries of the region in order to meet the increasing food requirements of the population. The main objectives are self-sufficiency in staple foods and import substitution, as well as the promotion of agricultural exports.

Self-sufficency and import substitution are of particular importance for grains — wheat, maize, rice and sorghum — in certain areas. In 1971, production of wheat in the developing countries of the region rose by 12.4 percent to 5.7 million tons, reflecting the increase that took place in northwest Africa, which normally accounts for about 75 percent of the total. Weather favoured production, especially in Morocco where the crop increased by 22 percent to 2.2 million tons. Little change took place in Ethiopia, which produces about 15 percent of the regional total. In Kenya yields increased, but area has been systematically reduced since 1969 to shift to maize cultivation.

Production of maize amounted to 11.1 million tons, an increase of about 6 percent over 1970. In east Africa, where maize is an important staple food, production increased considerably in Zambia (36 percent), Malawi (22 percent) and Rhodesia (29 percent). Together these countries account for about 20 percent of regional production. In Zambia, where it is the main staple food, after the particularly low level of 1970 production exceeded domestic requirements and eliminated the country's dependence on imports from South Africa and Rhodesia. Farmers in Zambia are shifting from Turkish tobacco cultivation to maize, which gives higher returns. Very high rates of growth were also attained in other small producing countries. However, in Kenya, which by itself accounts for some 12 percent of the regional output, maize production decreased by 7 percent because of severe drought for the second consecutive year.

Rice production increased by only 4 percent to about 5 million tons. Efforts to expand output are being made in most west African countries, where rice is becoming an increasingly popular staple food, but most of the 1971 increase reflects the rapid expansion in only one country, Senegal, where production rose from 98 000 tons in 1970 to 120 000 tons. New irrigated areas have been planted to high-yielding varieties, but the country must still import about half its requirements. Through the West African Rice Development Association (WARDA)

other countries are using improved cultivation methods, including high-yielding varieties, for establishing and extending rice production. The region's largest producer, Madagascar, has shown only a slight increase since 1967 in spite of efforts to expand output, partly as a result of difficulties with the extension programme and also because of relatively low producer prices.

Regional production of millet and sorghum, traditional subsistence crops, again increased only marginally to about 18 million tons. However, as a result of particularly favourable weather, there were very large increases in Mali and Senegal, of 50 and 61 percent respectively. A sharp increase in the millet and sorghum crops is mainly responsible for the large growth in agricultural production in 1971 in Botswana.

Cotton is cultivated as an import substitute crop as well as for export. Regional production appears to have fallen to about 543 000 tons, mainly because of a sharp decrease in Nigeria from 90 000 to 40 000 tons after an unusually short rainy season. This was only partly offset by increases in other countries. Although no further decrease was registered in Chad, the output of about 38 000 tons did not regain the 1968 level, due to reduced cultivation and low producer prices, while in the Central African Republic production has decreased further partly as a result of urban migration and increasing employment in the nonagricultural sector, particularly in diamond mining.

Among the edible oils which are also exported, palm oil output in the region appears to have increased by 6 percent over last year's record 1.1 million tons. In Nigeria, which accounts for about half the region's total, production increased only slightly to 500 000 tons. In the second largest producer, Zaire, output increased by about 11 percent to 200 000 tons. Production of olive oil doubled in 1971 and reached a record 250 000 tons. The increase was shared by the three Maghreb countries and reflected particularly favourable weather.

There was a near record production of groundnuts in 1971, with an increase of more than 20 percent to 4.3 million tons. About half the regional production originates in Nigeria and Senegal, where output increased by 41 and 65 percent respectively. Although weather favoured the crops in both countries, in Senegal a number of measures were taken to encourage output, including cancellation of agricultural debts, increased producer prices, payment without delay for produce and increased subsidies for fertilizers. Crushing facilities in this country are being expanded and Senegal plans to process its entire production this year.

Among the beverage crops, cocoa production in Africa represents more than 65 percent of world output, with Cameroon, Ghana, Ivory Coast and Nigeria producing about 95 percent of the regional figure. Production has continued to increase rapidly in Cameroon and Ivory Coast and record crops were gathered in 1971. An improvement also took place in Ghana, the largest producer; but in Nigeria the crop was smaller as a result of unfavourable weather. Coffee production was slightly greater than in 1970, which was a good year, while tea production showed only a small growth because of severe drought in east African producing countries, with the exception of Tanzania where a record crop was reported.

The downward trend in wine production reflects the deliberate policy of the Maghreb countries, and in 1971 output fell by 5 percent to about 1 million tons. A 7 percent increase in sugarcane production enabled the main producers, Congo, Madagascar and Mauritius, to profit from high world market prices. Severe drought affected east African sisal production and the region's output fell to 347 000 tons. Sisal area has been reduced in Kenya by 30 percent since 1960 and substantial reductions have also taken place in Madagascar.

The dependence of many countries in Africa on one staple or export crop is illustrated by the unusually large increases in the 1971 agricultural production in certain countries as a result of exceptionally good harvests for only one or two commodities. The 31 percent growth in Senegal reflects a good groundnut harvest, while the 39 percent expansion in Botswana resulted from a large increase in millet and sorghum production. In Zambia, the maize crop was mainly responsible for the 20 percent increase in agricultural production, while larger groundnut and maize crops contributed to the 10 percent overall increase in Malawi. This dependence emphasizes the urgent need to diversify agricultural production in the region.

Trade in agricultural products

At the world level the international financial crisis, culminating in December with the U.S. dollar devaluation, invited caution and led to a weak stocking policy during the first part of 1971, but the situation was reversed when world stocks of tropical agricultural products fell to alarmingly low levels. The results of this situation were felt in Africa as the region's trade is mainly directed toward developed countries. Inter-African trade represents only 6.7 percent of imports and 6 percent of exports of the region. Thus the sharp increase in foreign earnings noted in developing African countries in 1970 was not repeated in 1971. Compared with 1957-59, the volume and value indices of exports for 1969-71

were at about the same level, 126 and 123 respectively, or a mere 2 percent annual increase over the base period.

The volume of exports fell sharply, the largest decrease being in the food and feed group. However, the export value for the same group, which accounts for 31 percent of agricultural export earnings, decreased less because world market prices for commodities of that group were generally higher than in 1970 (Table 2-44). The value of exports of beverages and tobacco, which account for 57 percent of earnings, fell by 10 percent as a result of both reduced volume and low prices, while earnings from agricultural raw products declined by 7 percent.

Reduced exports of food products are in some countries the result of deliberate policies to divert the benefits of increased output to domestic consumption. This tendency is particularly well illustrated for cereals, sugar, and oils and oilseeds where greater production was accompanied by lower exports. Regional cereal exports decreased in spite of larger production. Shipments of wheat from Kenya were down by 10 percent, maize from Angola and rice from Madagascar by 30 and 42 percent respectively, and the overall value fell by 25 percent. Oil and oilseed exports decreased sharply to the lowest level since 1967 in spite of record production and the value of shipments declined by 10 percent. Most of the reduction was accounted for by groundnuts and groundnut oil, earnings from which decreased by 26 and 34 percent respectively. The fall in value of groundnut exports was larger in Nigeria and Senegal where the volume decreased by 53 and 38 percent, due partly to the Nigerian restoration of crushing facilities and to efforts in Senegal to crush output domestically. Nevertheless, groundnut oil exports also decreased by some 50 percent in these countries, reflecting the priorities given to domestic demand. Palm oil exports increased slightly by 3 percent to 206 000 tons, as greater shipments from Dahomey and Ivory Coast were partly offset by decreases in Nigeria and Zaire. The record production of olive oil in the Maghreb countries profited mainly Tunisia, which more than doubled its exports at higher unit values.

Raw sugar exports decreased by 22 percent to 1 014 000 tons, due to reduced output in Réunion but also as a result of expanded agro-allied industries in Congo and Madagascar, which increased refined sugar exports by one third and 150 percent respectively, bringing regional exports to a record 154 000 tons. The diminishing volume of raw sugar exports offset high world prices, and earnings declined slightly. The largest single producer, Mauritius, will benefit from higher prices for shipments to the United Kingdom, recently negotiated under the Commonwealth Sugar Agreement for the period 1972-74. Among the other

TABLE 2-44. – AFRICA: [1] INDICES OF VALUE OF EXPORTS OF AGRICULTURAL PRODUCTS

	Share of total agricultural exports in 1971	1967	1968	1969	1970	1971[2]	Change 1970 to 1971
	Percent	*1957-59 average = 100*					*Percent*
AGRICULTURAL PRODUCTS	100	108	117	117	133	123	— 7.8
Food and feedstuffs	31	105	116	110	109	104	— 4.4
Cereals	1	68	86	73	57	42	— 25.5
Sugar	6	127	129	142	155	150	— 3.0
Oils and oilseeds	12	85	95	85	83	75	— 9.7
Live animals and meats	3	230	236	240	254	323	+ 27.2
Beverages and tobacco	57	114	123	127	156	140	— 9.8
Coffee	29	147	166	157	196	199	+ 1.7
Cocoa	20	127	138	143	193	160	— 17.0
Tea	3	222	256	259	277	271	— 2.0
Wine	2	30	35	58	48	20	— 58.5
Raw materials	12	98	96	101	116	108	— 6.9
Cotton	8	109	109	111	133	130	— 2.6
Rubber	3	86	89	111	115	102	— 11.9
Sisal	1	89	77	76	83	68	— 17.7

[1] Excluding South Africa. – [2] Preliminary.

producers, Malawi and Uganda were given quotas under the United States Sugar Act.

Although live animals and meat do not yet represent an important item in the region's exports, a large increase took place in both the volume and value of trade in 1971. This trend is likely to continue as new ranching and cattle-breeding projects as well as slaughterhouse facilities are contemplated in Africa.

Exports of beverages and tobacco decreased both in volume and value. Coffee exports remained at the same level, 1 million tons, with increases in Ethiopia (20 percent), Ivory Coast (8 percent) and Zaire (16 percent) offset by decreases in Tanzania (18 percent) and Uganda (14 percent). Prices again increased substantially for Robusta, reaching the highest level since the mid-1950s, whereas Arabica prices declined sharply. The region being mainly a Robusta producer, the value of coffee exports increased by some 1.7 percent. Carryover stocks increased to 703 000 tons, about 50 percent of total regional production.

Cocoa exports increased by 5.7 percent to 906 000 tons, but prices dropped again in 1971, and all major exporting countries — Cameroon, Ghana and Ivory Coast — showed a decrease in foreign earnings except Nigeria, where a substantial increase in exports (38 percent) offset the lower unit value. The need to reach a general agreement on cocoa has been stressed very often, but no progress has yet been made. Tea exports remained at the same level as the previous year (104 700 tons) with Tanzania and Uganda slightly improving their sales while Kenya's decreased; a decline in unit values resulted in lower returns.

The EEC common wine policy has seriously affected north African wine shipments and part of the losses can be regained only by the promotion of quality exports. Volume was down by 52 percent in Algeria to 600 000 tons, 58 percent in Morocco and 46 percent in Tunisia to 44 000 tons each. Algeria, the main producer, is for this reason carrying out an uprooting programme and 15 000 hectares were eliminated in 1971.

Many raw materials produced in Africa encountered favourable market conditions because world stocks were very low and prices were sustained. World stocks of cotton were the lowest since 1953, but higher prices accelerated substitution by man-made fibres. Higher prices — by about 7 percent — could not match the region's decreased export volume (9 percent), due to higher domestic consumption, as in Tanzania and Uganda, sometimes coupled with lower production, as in Cameroon and Nigeria.

World stocks of sisal were completely exhausted in 1971 and following a reactivation of the Consultative Sub-Committee on Hard Fibres, prices were firm compared with 1970, but exports were lower mainly due to a decrease in Tanzanian output (by 18 percent to 160 000 tons).

The unit values of rubber were so low that in spite of a world restocking policy in natural rubber and a subsequent increase in export volume, mainly from Liberia (26 percent to 86 000 tons), Nigeria and Zaire (22 percent to 72 000 and 38 000 tons respectively), the total value for the region decreased by 12 percent.

On the import side, the results of allocating more locally produced food and feed to the domestic market, and of promoting import substitution policies, are reflected in the moderate volume increase for agricultural imports compared with 1970, a mere 1.3 percent in volume but 6.9 percent in value due to generally higher prices. However, cereal imports increased, especially of wheat into Morocco (90 percent to 680 000 tons), but this expansion was offset by decreases in Nigeria and Tunisia; Mali had to import sorghum for the first time (20 000 tons), and a further rice deficit in Ivory Coast led to larger imports (65 percent to 130 000 tons). Due to lower prices for cereals, the overall deficit of the region did not increase the import bill, which even decreased slightly. On the other hand, higher international prices were responsible for an increase in the bill for sugar imports although these were down by 8 percent. Larger imports of oils and oilseeds reflected increased purchases of palm oil by Kenya (117 percent to 15 000 tons) and soybean oil by Morocco (17 percent to 45 000 tons) and Tunisia (70 percent to 48 000 tons). In the latter country olive oil exports were promoted due to higher prices, and larger quantities of soybean oil were imported to supply the domestic market.

Development plans and policies

No less than 30[62] countries in the region are now implementing their development plans. The number of trained agricultural planners is steadily increasing and requests for external assistance continue. Planning units are becoming an established part of ministries of agriculture.

Plan objectives generally remain the same, although emphases and policy strategies differ. Rural development and employment are common objectives, as are food self-sufficiency, agricultural diversi-

[62] Algeria (1970-73). Botswana (1970-75). Cameroon (1971-76). Central African Republic (1971-75). Chad (1971-75). Congo (1970-74). Dahomey (1971-72) (1973-76). Ethiopia (1968/69-1972/73). Gabon (1971-74). the Gambia (1971-75). Ghana (1971-76). Ivory Coast (1971-75-1976-80). Kenya (1970-74). Lesotho (1970/71-1974/75). Madagascar (1970-74). Malawi (1969-71). Mali (1970-73). Mauritania (1970-73). Mauritius (1971-75). Morocco (1968-72). Niger (1971-74). Nigeria (1970-74). Senegal (1969-73). Sierra Leone (1970/71-1979/80). Swaziland (1969-74). Tanzania (1969-74). Togo (1971-75). Tunisia (1969-72). Uganda (1972-76). Upper Volta (1972-75). Zambia (1972-76).

fication and the earning of foreign exchange. Rural development offers one of the greatest challenges to African countries in terms both of financial resources and skilled manpower. The difficulty of tackling rural development on a broad front while avoiding uneconomic dispersal of funds has encouraged "zonal development" in some countries. For example, Zambia is to create "intensive development zones," a programme of assisting peasant farmers in selected areas to adopt modern agricultural practices, using various inputs and production aids provided by the Government on a package basis.

The third five-year plan of Ethiopia (1968/69-1972/73) also adopts the package project approach for implementing programmes to improve peasant agriculture. These projects are normally relatively self-contained units requiring many kinds of effort (research, material inputs, credit, marketing, road building, water supply, etc.) in carefully defined areas. One such project, the Chilalo Agricultural Development Unit, has been in operation for almost four years and is reported to have been very successful in introducing profitable innovations to small farmers while serving as a pilot unit. Many of these projects are contemplated; the second, the Wolamo Agricultural Development Unit, started in 1969. In Gabon, the Government is actively encouraging regional investment to avoid the concentration of industries in the big cities, in an attempt to halt the exodus from rural areas. Ivory Coast will also concentrate on the development of remote areas, especially in the west.

Several countries in the region have either a long-term strategy or are working on perspective plans to provide guidelines of development over a decade or so from which medium-term plans will evolve. Malawi, for example, maintains a three-year revolving public sector development programme; the country is now preparing a ten-year perspective plan under which the three-year plans will continue to operate. Ivory Coast's perspective plan stretches to 1980 and the present five-year plan evolved from it. Nigeria is preparing a perspective plan for agricultural development to 1985. Uganda's perspective plan (1966-81) provided the framework for both the second and third five-year plans; with revision, the fourth plan will evolve from this. Chad is also reported to be working on a ten-year programme.

Employment generation continues to be given priority in most countries. The first mission to be sent to an African country under the World Employment Programme of the United Nations assembled in Kenya in March 1972 to assist the Government in devising a strategy for achieving a high rate of productive employment.

Cameroon, Gabon, Ivory Coast, Mauritius, Niger and Togo began their development plans last year, followed by Dahomey and the Gambia, while Uganda and Zambia published theirs early in 1972. The third five-year plan of Cameroon emphasizes infrastructural and agricultural development. About half the investment proposals under the plan are to be founded by the Government, in contrast to the second plan when three quarters were externally financed. Rural development is to be assisted by the formation of agro-industrial complexes to handle agricultural produce at places of production. Higher producer prices and the establishment of an agricultural credit system are expected to result in a 4 percent annual increase in primary production, while the GNP is projected to grow at 7.3 percent a year.

Ivory Coast's five-year development plan (1971-75) derives from the ten-year outlook plan of 1971-80, for which an 8 percent rate of growth of GDP, at constant prices, is foreseen. To enable the country to achieve a positive trade balance it is planned that agriculture should account for about 40 percent of both GDP and total exports by 1975. The current five-year plan estimates an annual growth of 4.1 percent for agriculture and 12 percent for industry; 20 percent of total public investment of some 252 000 million CFA francs will be spent on agriculture, 50 percent on infrastructure, particularly transport, and 7 percent on health. Annual growth in GNP is projected at 7.7 percent to reach some 513 000 million CFA francs in 1975. Special attention is to be given to the improvement in living conditions of the rural population, especially in the remote areas in the west. About 10 percent of public investment is expected to be funded externally.

A major preoccupation of both the long-term plan and the four-year plan of Mauritius is the creation of employment. The four-year plan aims at the provision of 52 000 new jobs by 1975 and another 130 000 by 1980. The "Travail pour tous" programme is expected to create 20 000 new jobs by 1972. An 11 percent yearly increase is forecast in the manufacturing sector, compared with 4 percent in agriculture (2 percent for sugarcane) to be derived from higher yields.

Transport and communications are accorded top priority in Togo's second five-year plan (1971-75). A diversification programme is to be the main basis for the country's agricultural development. The Gambia's third development programme (1971-75) plans to develop agriculture, education and communications. This programme also expects through diversification to increase production of rice and cotton.

Uganda's third five-year development plan (1972-76) aims at a more equitable distribution of income and wealth through rural development as well as increasing employment. GDP will grow at 5.6 percent per year; agricultural production in the monetary

sector by 4.8 percent per year. Another aim is that all paid jobs be held by Ugandans by the end of the perspective plan in 1981.

The first national development plan of Zambia was formally scheduled to end in December 1970 but continued through 1971. The second five-year plan launched in January 1972 envisages an annual growth rate of 6.8 percent of GDP, compared with nearly 12 percent during the first plan. The highest growth rate, 15 percent per year, is projected in the manufacturing sector, while agriculture is expected to grow at 6 percent and the mining sector, still the most important in the economy, at 6.1 percent per year. One of the main objectives is to stimulate rural development, and a new policy will aim at the creation of intensive development zones to concentrate public services and investment in well-defined rural areas.

More meaningful criteria are needed to assess the performance of development efforts. Apart from the fact that sometimes the data used are found to be grossly incorrect, opinions differ as to whether targets should be achieved with given identified resources or whether these should be inflated to the extent of spurring private enterprise and initiative to greater effort. Nevertheless, target fulfilment or nonfulfilment do give broad indications of plan performance. An assessment[63] of Uganda's second development plan indicates that the total GDP grew by 4.4 percent per year compared with the target of 6.3 percent. Growth of total monetary GDP showed considerable variation from year to year, reflecting movements in agricultural output. Over the first two years of the plan, monetary GDP increased by only 2.4 percent yearly, due mainly to the sharp fall in cotton output and the stagnation of coffee production caused by adverse weather. Thus, in the following year when the two crops recovered strongly, GDP increased by 12 percent. There were wide differences in the extent to which sectoral growth targets were achieved. In agriculture, however, the shortfall (in the growth of the sector) was small.

As foreseen, some of the most important assumptions underlying the second development plan of Nigeria (1970-74) have changed significantly. The financial resources available have surpassed expectations; the country's potential mineral wealth, it has been revealed, is vaster than expected. Total retained earnings from petroleum exports alone accounted for 55 percent of total foreign exchange earnings in 1971. The overall rate of growth in 1970/71 is estimated at 9.6 percent, double the rate of 4.7 percent projected for that year in the plan. The basic problem will be to diffuse the net revenues through the economy to stimulate broad economic development, particularly rural development, and to give farmers and the rural population a fair share of the nation's wealth.

[63] Uganda. *Third five year plan 1972-76*. Entebbe. 1971. p. 27-40.

Rural employment in tropical Africa[64]

Rural employment was not recognized as an important problem in tropical Africa until recently. Agriculture was based on subsistence, and still is in many regions. Moreover, labour in traditional agriculture was often considered to have a marginal productivity of zero. Rural areas were thought of as a reservoir of low-paid unskilled workers for whom the labour supply curve was generally " backward bending."

In the 1950s better medical facilities became available and the rate of population growth rose sharply. Independence for many African countries in the 1960s brought with it immediate problems and rural employment did not receive the attention it deserved. As a result traditional labour policies continued. They have not been very rewarding. Annual population growth in Africa is very high and in many countries is above 3 percent, in a continent where the economically active population in agriculture as a percentage of total economically active population is the highest in the world, and will remain so for the next 20 years (Table 2-45). Women constitute a substantial proportion of the economically active population and the majority of them are engaged in agriculture.

Moreover, tropical Africa is the only region in the world where the annual rate of growth of population economically active in agriculture is increasing, as well as the population dependent on agriculture, the latter faster than the former (Tables 2-46 and 2-47).

These tables imply that the burden of agricultural output will increase substantially at the family level,

TABLE 2-45. – AFRICA AND WORLD: ECONOMICALLY ACTIVE POPULATION IN AGRICULTURE AS A PERCENTAGE OF TOTAL ECONOMICALLY ACTIVE POPULATION

	1950	1960	1965	1970	1975	1980	1985
	..... *Percent*						
Africa[1]	84.7	80.5	78.1	75.5	72.6	69.2	65.1
World.	64.1	57.8	54.6	51.4	48.1	45.0	41.9

SOURCE: Projection of world agricultural population. *Monthly Bulletin of Agricultural Economics and Statistics (FAO)*. Vol. 21. No. 1. January 1972. p. 6.

[1] Including South Africa.

[64] Africa excluding the northwest and South Africa.

TABLE 2-46. – TROPICAL AFRICA: ESTIMATES AND PROJECTIONS OF POPULATION ECONOMICALLY ACTIVE IN AGRICULTURE AND RELATED AVERAGE ANNUAL GROWTH RATES, BY REGION AND SUBREGION, 1950-85

	Population							Average annual growth rate					
	1950	1960	1965	1970	1975	1980	1985	1950-60	1960-65	1965-70	1970-75	1975-80	1980-85
	Thousands							*Percent*					
AFRICA	61 640	69 004	73 583	78 727	84 020	89 599	95 711	1.1	1.3	1.4	1.3	1.3	1.3
West Africa	24 958	27 290	29 146	31 196	33 344	35 696	38 346	0.9	1.3	1.4	1.3	1.4	1.4
Central Africa	9 958	10 944	11 411	11 917	12 396	12 882	13 435	0.9	0.8	0.9	0.8	0.8	0.8
East Africa	25 842	29 791	31 999	34 539	37 156	39 847	42 702	1.4	1.4	1.5	1.5	1.4	1.4
Southern Africa	882	979	1 027	1 075	1 124	1 174	1 228	1.0	1.0	0.9	0.9	0.9	0.9

SOURCE: Projections of world agricultural population, *Monthly Bulletin of Agricultural Economics and Statistics* (*FAO*), Vol. 21, No. 1, January 1972.

and that means must be found to absorb population growth in the rural areas — difficult problems, especially if income (and thus productivity) per head is to be increased.

A modern version of the labour reservoir theory has led many economists and planners to conclude that more jobs should be created in the industrialized (urban) sector to absorb the flow of people from rural areas. The rate of urbanization is, however, much faster than the rate at which new jobs are created, leading to very high rates of unemployment and underemployment in the huge new cities emerging in Africa. A growth rate in urban population of 8 to 10 percent is not uncommon, coupled with an unemployment rate of 15 to 20 percent. The mere chance of getting cash wages in the city is enough to attract people from rural areas, where wages are much lower and often mostly in kind. Wage-earners are a relatively small part of Africa's population.

Education systems have contributed to unemployment. The 1961 aim: "Literate Africa by 1980" has given place to "Literate as fast as possible" (Addis Ababa, 1968) which is more realistic. Education is not generally adapted to a society where as much as 60 to 80 percent of the population is in agriculture. Too often the system is unrelated to Africa's current needs and situation. It alienates the young literate from rural work while failing to provide enough skilled workers for the cities. Few countries have a clear national policy which takes into consideration women's contribution to agricultural development as an integral part of the total development plan. Capital-intensive policies in the cities and even in the countryside have worsened this situation. The achievement of GDP growth associated with rising employment often occurs in sectors still insufficiently equipped to integrate new capital-intensive technologies into their economy.

TABLE 2-47. – TROPICAL AFRICA: ESTIMATES AND PROJECTIONS OF POPULATION DEPENDENT ON AGRICULTURE AND RELATED AVERAGE ANNUAL GROWTH RATES, BY REGION AND SUBREGION, 1950-85

	Population							Average annual growth rate					
	1950	1960	1965	1970	1975	1980	1985	1950-60	1960-65	1965-70	1970-75	1975-80	1980-85
	Thousands							*Percent*					
AFRICA	131 211	152 818	166 077	181 517	199 119	218 719	239 963	1.5	1.7	1.8	1.9	1.9	1.9
West Africa	51 994	60 176	65 659	72 031	79 410	87 914	97 373	1.5	1.8	1.9	2.0	2.1	2.1
Central Africa	21 455	24 324	25 911	27 734	29 872	32 226	34 824	1.3	1.3	1.4	1.5	1.5	1.6
East Africa	56 082	66 414	72 483	79 590	87 529	96 102	105 111	1.7	1.8	1.9	1.9	1.9	1.8
Southern Africa	1 680	1 904	2 024	2 162	2 308	2 477	2 655	1.3	1.2	1.3	1.3	1.4	1.4

SOURCE: Projections of world agricultural population, *Monthly Bulletin of Agricultural Economics and Statistics* (*FAO*), Vol. 21, No. 1, January 1972.

Ways of tackling the employment problem can be grouped, conveniently, under several headings. There is "technological" change: often mechanization has been recommended for increasing labour opportunities and productivity in rural areas. Few figures exist for Africa as it is only beginning to experiment in this field. However, many large-scale tractor schemes have been tried (Ghana, Madagascar, Nigeria, Sierra Leone, Tanzania, Uganda). These schemes have had to be heavily subsidized and generally have failed, for many and well-known reasons: machinery not adapted to local environment, poor management, low degree of utilization, lack of spare parts and maintenance. Moreover, the tractors and equipment often could be used only on large estates, and thus were not adapted to the structure of African agriculture. It is relevant for tropical Africa that experience in Asia has shown that the introduction of large-scale machinery results in substantial reduction of labour requirements (10 to 25 percent).

High-yielding varieties are not yet in common use in tropical Africa except for maize in east Africa and rice in Madagascar. These varieties demand much more care in cultivation, and experience in Asia shows they increase demand for labour by some 20 to 50 percent at the farm level.

High-yielding varieties and mechanization do not provide a solution on their own. Programmes of research and adaptation are also needed. The International Institute of Tropical Agriculture in Ibadan, Nigeria, could play a leading and decisive role in these if field tests were conducted throughout Africa with the assistance of existing research centres in Zaire and Ivory Coast and the West African Rice Development Association. Up to now in tropical Africa techniques and knowledge have too often been simply transferred from other regions of the world.

Much land in Africa is still uncultivated and represents a vast potential. But it will not be put into cultivation without government and public help for costly infrastructure, especially irrigation combined with high-yielding varieties and multiple cropping. Besides technical inputs, changes are needed to ensure that access to new but relevant techniques is radically improved. There is a real danger that a substantial part of the benefits of technological changes may profit only the already prosperous farmers who have easy access to credit and marketing, and those financially able to adapt to technological inflation (higher costs of technological inputs), thus leaving aside the more traditional (small) farmers. Ultimately these may choose either to ignore the technological changes, or migrate, as they are unable to compete, thereby aggravating urban unemployment and income problems. Extension and credit are thus important elements in any programme for rural welfare.

A major problem still exists, however, in the question "What is to be produced?" The creation of new jobs coupled with higher productivity in agriculture profit a country, but improved productivity has other implications. The rate of growth of the "green revolution" might exceed growth in demand, and world surpluses might be not too far ahead. In tropical Africa, the first answer to this question is given by the avowed target of self-sufficiency in staple foods and, where possible, the replacement of imported by locally produced food (import substitution). This implies a curb on interregional trade as most of the countries concerned produce the same commodities. As for international trade, unplanned agricultural production will further deteriorate the terms of trade and, as a particular local effect, accelerate unemployment. The developed countries' responsibility can partly be met by working out international agreements to stabilize commodity prices, thus enabling developing countries to plan which commodities they will produce (diversification) as well as their patterns of output.

Where the choice can be made, African countries are increasingly promoting labour-intensive methods, in both urban and rural areas. Short-term solutions deal with problems of rural-urban migration. In Kenya, for example, tripartite agreements were tried in 1964 and 1970, whereby the Government and employers were to increase their total employment by some 10 and 15 percent respectively, while the trade unions agreed on a 12-month moratorium on wage increases. This increase in job opportunities led to a net inflow of job seekers and a recruitment curb from enterprises in order to assimilate the compulsory staff increase. Also, large estates were taken over, divided and distributed to African farmers.

In west as well as east Africa restrictions on migration have been enforced. In west Africa emphasis is on restriction of intraregional migration in the fear that nonnational migrants are competing with local labour. In east Africa restriction is on migration within the country. The "Travail pour tous" programme in Mauritius aims at providing jobs at wages inferior to the legal minimum in order to carry out public works. This programme is expected to finish as longer term solutions provide more jobs.

In the longer term, income policies are outlined in the plans of many countries (Ghana, Ivory Coast, Madagascar, Mauritius and east Africa in general), but few results can be assessed as yet. Improvement of the rural environment is now recognized as essential if rural-urban migration is to be slowed down.

Large-scale irrigation schemes are under way in Africa and are a prerequisite for more intensive farming with high-yielding varieties. The Senegal river, the Inga and Zambesi dams, the extension of Lake Alaotra in Madagascar and the irrigation programme in Mauritius dot Africa with many projects, but they will affect less than 1 percent of arable land by 1985. Small irrigation schemes are being attempted in some parts of Tanzania (mountain streams), Nigeria, Chad, Cameroon (shallow wells), but these are of only minor significance.

Rural employment in tropical Africa cannot be solved only by creating new jobs in urban or industrial sectors. A solution has also to be worked out concurrently in the rural sector. Development priority must be given to agriculture, with emphasis on human welfare. For this, balanced and carefully tested technological changes should be introduced, but these will have adverse effects if institutional patterns and incentives for agricultural production are not worked out at the same time, at national, regional and world levels.

Least developed countries

Many countries in Africa have a literacy rate of 20 percent or less, a per caput income of about or under U.S.$100, and a GDP where manufacturing represents 10 percent or less. A list of 25 countries fitting these criteria has been accepted by the United Nations General Assembly, within the framework of the Second Development Decade. The list includes 16 African countries which are among the "least developed" of the developing countries.[65] In a second list restricted to landlocked countries, 13 out of 20 are in Africa.[66] These lists are still likely to be altered as new criteria for eligibility are applied. A positive result of the third United Nations Conference on Trade and Development (UNCTAD III) held in Santiago, Chile, in April-May 1972, was the adoption of "special measures" in favour of the 25 least developed countries to help them catch up with the other developing countries.

In the least developed African countries, agriculture is a major contributor to GDP, employs a high proportion of the total active population and is often important for the trade balance. Nevertheless, by definition it is still traditional and based on subsistence, with few off-farm inputs and a very low productivity.

Improvement of agriculture is a vital part of any move to improve national incomes in these least developed countries. Actual plans to achieve this have to be worked out with the help of both developed and developing countries. Better coordination is essential and may require changes in the system of aid. Larger grants as well as soft and long-term loans are needed in order to reduce, at least, the already heavy burden of servicing the public debt. Project analysis requires that more attention be paid to aspects other than financial in assessing a project's relative contribution to a country's welfare. Other assistance is likely to take the form of exemption from trade quotas, special tariff concessions and other incentives to ease trade.

SOUTH AFRICA

Although the rate of economic growth in South Africa was somewhat slower in 1971, the GDP was nevertheless higher by about 10 percent at current prices, or 4 percent at constant prices. Tighter monetary and fiscal policies drained off much of the excess demand. However, the index of consumer prices was about 5 percent higher, with a somewhat smaller increase for food. The trade deficit widened and the international monetary crisis imposed a sudden drain on reserves which were already relatively low. Measures to restrict imports were announced at the end of November 1971 and the rand was devalued in December.

Agricultural production and income

Agricultural production reached a record level in 1971, 13 percent above 1970 and 5 percent above the previous record in 1967 (Table 2-43). With above-average rainfall, growing conditions were generally favourable and crop production accounted for all the 1971 increase. The maize harvest (8.6 million metric tons) was much larger than in the preceding year and second only to the record harvest of 1967. Wheat production continued the upward trend of recent years with a further 16 percent increase; 1970 production approximated estimated domestic requirements and the 1971 harvest exceeded them by an important margin. With adequate rainfall, sugar production recovered from the low level of 1970, and the 1971 harvest was the second largest on record. Output of citrus and deciduous fruits was also higher, as was that of most other crops.

The level of aggregate livestock production in South Africa showed no change in 1971. The wool clip was again lower, by 7 percent from the 1970

[65] Botswana, Burundi, Chad, Dahomey, Ethiopia, Guinea, Lesotho, Malawi, Mali, Niger, Rwanda, Somalia, the Sudan, Tanzania, Uganda, Upper Volta.

[66] Botswana, Burundi, Central African Republic, Chad, Lesotho, Malawi, Mali, Niger, Rwanda, Swaziland, Uganda, Upper Volta, Zambia.

level and by 23 percent from the 1967-69 average. Beef and veal production was slightly higher for the third consecutive year, but still lagged below the 1965-66 average. Pork production also increased but little change is reported for other livestock products. During the 12-month period ending August 1971, the number of cattle, pigs and goats declined slightly. The number of sheep is estimated to have fallen by almost 8 percent during the same period, largely as a result of the Government's stock reduction scheme — a conservation measure to prevent overgrazing.

The index of prices received by farmers in South Africa averaged about 4 percent higher in 1970/71. Prices of field crop products averaged almost 3 percent more, and were 15 percent higher for horticultural products, largely as the result of increased prices for vegetables. Prices for livestock products also averaged approximately 3 percent higher, as the sharp decrease in wool and mohair prices was more than offset by increases in slaughter stock (8 percent) and dairy products (6 percent). The index of prices for farming requisites averaged approximately 4 percent higher in 1970/71, with increases in the prices of all the component items. Although 1970/71 gross farm income was slightly above the record level of 1967/68, net farm income is estimated to have been about 5 percent lower, as the volume of inputs used was larger and prices for the requisites were higher. Net farm income in 1970/71 was at about the 1969/70 level; most of the additional income from the larger summer cereal harvest in 1971 will actually be realized during the 1971/72 farm income year.

The final report submitted to the Government by its Commission of Inquiry into Agriculture expressed serious concern for the large proportion of small, uneconomic farm units and the related low incomes of this segment of the South African farm population. The Commission advocated the restructuring of these units with respect to size, farming systems and levels of management, and the shift of displaced farmers to employment outside agriculture. Among its recommendations, the Commission included the selective screening of applicants for agricultural credit and the extension of credit only to those who have or can acquire adequate managerial ability and units of an economic size. It proposed that agricultural credit be extended on a provisional basis and that it be followed up with an effective management advisory service.

Trade in agricultural products

The level of South Africa's foreign trade in agricultural commodities was generally lower in 1971. Exports were smaller by 4 percent in volume and 7 percent in value. Imports were also down, by 8 percent in volume and 6 percent in value.

For the second consecutive year the volume of wool exports (79 000 tons) was significantly smaller. With prices again much lower, their value (U.S.$60 million) was about 33 percent below 1970 and 55 percent below 1969. In terms of export value, wool was outranked in 1971 by both sugar and maize. Although the volume of sugar exports was slightly smaller, prices were higher and the value of 1971 exports ($80 million) was up by about 18 percent. Maize shipments were about 5 percent lower in both volume and value. Exports of oranges increased 9 percent, but with prices much lower were 30 percent down in value. Exports of apples and grapes were higher in terms of both volume and value.

South Africa's imports of cotton continue to increase and were larger by 6 percent in volume and 20 percent in value. Rice imports increased by about a quarter in both volume and value. Imports of dairy products (butter, cheese and dry milk) continue to grow rapidly, with the 1971 value ($18 million) 75 percent higher than in 1970 and almost nine times that in 1969.

Chapter 3. - EDUCATION AND TRAINING FOR DEVELOPMENT

Pattern of the First Development Decade (1960-70)

The First Development Decade was marked by the start of a refreshing change of attitude toward the complex of rural and agricultural development in the third world. In their understandable zeal to achieve rapid economic growth and expansion, developing countries had tended to lose sight of the tremendous potential of their rural hinterlands, with the result that the division between urban and rural sectors had become dangerously accentuated. In the earlier history of many developing countries urban and rural societies had been relatively well integrated; the towns and cities were the centres of administration, culture, trade and crafts, and the market places for the products of the land. With the impact of western technology and industrialization, urban centres have grown in size and importance and the gap between town and country has become a veritable gulf. The urban sector has expanded; the rural sector has remained traditional, isolated and remote from the social and economic infrastructures which are developing in the towns and cities. For too long the situation had been neglected with the result that the prodigious natural and human resources of the rural areas were not made available for development.

A new awareness of the importance of rural peoples to development is, however, leading to positive attempts in most countries to correct the imbalance and toward an appreciation of the fact that a larger share of productive resources must be allocated to the rural sector.

In line with this change of attitude there has been a tremendous expansion in the number of agricultural educational institutions and of graduates and diplomates turned out.[1] These achievements have been supported by bilateral and multilateral aid, but the initiatives have been primarily self-engendered as a result of the growing awareness of the potential of the nonurban sector.

It is understandable that in the beginning many mistakes have been made; that priorities have been confused and scarce resources wastefully applied. The educational and training pyramid has too frequently become inverted, overweighted by the numbers turned out at higher levels, with little regard to lower levels of training. This inversion is to be observed in a number of countries and is particularly acute, for example, in Egypt and in many countries in Latin America where there is an excess of higher level graduates. There is usually little proven expertise on which to build, and in the anxiety to achieve quick results many developing countries have not experimented sufficiently with systems of education and training directly related to their needs.

One of the drawbacks in the establishment of systems of agricultural education and training has been the absence of adequate planning. This has resulted in lack of coordination both between the various components of the systems and between other agents of development. In part this has been due to the conflicting interests of the various ministries and departments having some say in and responsibility for educational planning and development. Ministries of agriculture have usually been involved at the intermediate and vocational levels, with ministries of education responsible for the higher levels. The resulting dichotomy has been restrictive; notably so where there has been no form of central authority. Despite considerable experiment with different systems, methods and levels of agricultural education and training, efforts to derive criteria based on past experience have been signally lacking. More research and investigation in this field would have been of great value both nationally and internationally.

In many instances institutional agricultural education has suffered from the use of exotic models transplanted, with little modification, from other countries where they have been evolved to meet different physical, economic and social environments. There is nothing wrong in borrowing from the experience of others; all cultures and their supporting systems

[1] In the countries of Latin America, for example, the increase in colleges of agriculture, animal husbandry, agricultural engineering and forestry science between 1964 and 1969 was from 15 to 151. In Asia, between 1957 and 1968, the number of higher agricultural education institutions increased by over 150 percent and the number of graduates by 250 percent. Also the proportion of agricultural graduates to total number of graduates in all disciplines increased from 2.9 to 3.5 percent.

of education have been ecletic from earliest history. The danger lies in the model becoming the end in itself and not the means to an end. This is particularly true of an imported educational system which becomes rigid and inflexible due to the lack of confidence of those who operate it when they are remote from the cultural environment in which the system originated.

The universities, in their faculties concerned with agriculture and rural development, should set the pace; their influence is bound to be dominant throughout the educational and administrative hierarchies. Yet it is often the universities themselves — in their desire to foster and preserve their international academic currency — which are the most inflexible and the least willing to risk experiment. In many developing countries, also, they have comparatively little autonomy.

Bilateral and multilateral aid must carry some responsibility for this failure in planning. Aid has been too concerned with the specifically technological aspects of agricultural production, and even in this sphere there has often been great imbalance between the various levels of education and training. Undue emphasis has been given to institutional training, to the neglect of less formal continuing training. Admittedly, the latter presents greater initial difficulties, demanding rare qualities of leadership and experience. Furthermore, less formal education, extension and training schemes must, by their very nature, evolve indigenously, even if guidance and expertise come from developed countries. An example of the relative ineffectiveness of a transplanted extension organization comes from the Andean zone of Latin America where the United States pattern of extension work was used with too little modification to accommodate it to the highly specific needs of an entirely different social and technological environment.[2]

Higher education

The First Development Decade saw the expansion of higher agricultural education in nearly all the developing world. Governments embarked upon ambitious programmes, and universities, colleges and other postsecondary institutions received a considerable share of available resources. There has been universal awareness that economic development and growth depend on the availability of highly trained personnel. The strengthening of existing universities and the creation of new ones during the decade has been remarkable, and although agricultural education in many countries failed to receive the attention and financial help given to its more prestigious competitors (such as law, medicine, social sciences and engineering), it did make considerable progress.

A number of comprehensive agrarian campuses have been recently established, notably in Asia, to serve the rural communities.[3] Such campuses are not only representative of almost all levels of agricultural education and training, but are concerned with wider interests involving the whole complex of rural development and have been actively involved with their regional communities. It is believed that much has been lost by the division of agricultural education and training into rather arbitrary parts. There is much to be gained by drawing together on one campus all the interests of education, training, extension and research, and the interconnected disciplines and studies involved in coordinated rural development. Based outside the great city centres, such campuses have an influential role to play in overcoming the lack of status of rural life which is a primary obstacle to the cultural and social as well as the economic development of the nonurban sectors. Isolation of higher agricultural education from direct involvement with the life of the rural community has been one of the causes of its limited effectiveness.

Intermediate education

The intermediate level of agricultural education and training has suffered most from uncertainty and constant change. In many countries it is the one which has been least developed although it has a vital importance, particularly at the early stages of national development when there is a great need for technicians to fill government posts in extension or field work. Intermediate level education has suffered from being a pale imitation of university faculties of agriculture, whereas the training required to produce the really competent technician must differ radically from that given at higher levels. Patterns of intermediate training, too, often follow those of more advanced countries. They tend to be too closely geared to civil service requirements and remote from actual and future needs of agricultural development.

An intermediate institution which sets out to emulate the higher levels is destructive of its raison d'être. Many who instruct in this sector (and their students) come from urban backgrounds and are lacking in field experience. Their experience in what might be called the social laboratory is frequently regrettably inadequate and practical work is too often despised by teacher and student alike. This

[2] U.S. Agency for International Development. *Extension in the Andes: an evaluation of official U.S. assistance to agricultural extension service.* Washington, D.C., 1971. Evaluation Paper 3.

[3] In 13 Asian countries 10 percent of the university-level institutions offering agricultural education are agricultural universities as such, and account for one quarter of all students studying agriculture.

is an area in which teacher training is of critical importance. If teachers at the intermediate level are the products of the existing system, or raw university graduates, they will tend to perpetuate a system of training which leaves much to be desired and is remote from practice.

It would be helpful if the term " intermediate " could be dropped from the agricultural training vocabulary. It is not intermediate between higher agricultural education and vocational training; it should be regarded in its own right as the practical training of agricultural technicians. Neither need it be carried out through two- or three-year institutional courses. There is scope to experiment with short recurrent courses and thus ensure that the trainees do not become divorced from the field level.

A number of successful attempts have been made to establish farmer training centres of various kinds, as in east Africa, but this direct and expensive approach to farmers and their families has made little progress in this decade. However, there have been a number of successful attempts to set up comprehensive development projects covering specific areas in which education and training have been included, much of it wisely developed on an informal rather than institutional basis. The Comilla project in Bangladesh, the PACCA project in Afghanistan and the Cadu project in Ethiopia (the last two being financed by Sweden) come readily to mind as examples. There is much to be learnt from such methods of approach.

Targets for the Second Development Decade

Past experience forms the basis of future action but this must involve objective critical analysis. The proceedings of the FAO/Unesco/ILO [4] World Conference on Agricultural Education and Training [5] at Copenhagen indicate the need for this. The conference provided an excellent basis for a more detailed critical analysis but in itself was too broadly based a forum to permit the detailed constructive questioning which every country should carry out. Each region should be encouraged to review its own situation in the light of the conference. This has already been done in some.[6] The country profile studies in the field of trained agricultural manpower and educational and institutional systems and services, to be undertaken by FAO in 1972-73 in a number of countries, are likely to be a constructive step. These studies will be concerned primarily with trained manpower needs in the agricultural sector and will have two principal objectives: first, to provide these countries with a comprehensive analysis of their systems of agricultural institutions and services, and to assess the implications for trained manpower needs and for educational planning; second, by working through national institutions in each case, to stimulate a continuing interest and activity in the agricultural side of manpower and educational planning and methodology. Education and, especially, training have in the past suffered from being too directly production-oriented, and production itself has been too limited to the primary produce of the farm. It is certainly important in the preparation of the nonurban sector for change and development to regard the strictly agricultural producers as being only an element, however important an element, in the community. (The term " nonurban " is here used advisedly in place of rural or agrarian — terms that have certain historical overtones which limit them.)

Those who are actively concerned with education and training should remember that these are in fact only one of the inputs required for agrarian development and must take their place among many other essential inputs which include land tenure systems, price structure, processing, marketing, transport, communications, the provision of ancillary services, and so forth. They are in the queue but the queue is a long one.

The educational and training measures needed to support rural development are confusingly wide but if they are to become effective they must be oriented to, and closely integrated with, the comprehensive development strategy. This is easy enough to state but what is its relevance to more precise circumstances? Such general comments have for too long covered pages of well-meaning reports without coming to realities. Take as one example the green revolution, with its dynamic potential. The initial breakthrough was brought about by straightforward genetic improvements, but these involved entirely new attitudes on the part of the producers toward their inputs in terms of their use of water, fertilizers, pest controls, and even toward their cropping systems: productive short-duration crops opened up the possibility of multiple cropping. The investment in these inputs became potentially rewarding and increased demands for credit, posed problems in marketing and in effect began the conversion of a subsistence agriculture to a cash economy. This implies the integrated planning of education and training, both

[4] Food and Agriculture Organization of the United Nations: United Nations Educational, Scientific and Cultural Organization: International Labour Organisation.

[5] FAO/Unesco/ILO. *Report of the World Conference on Agricultural Education and Training, Copenhagen, Denmark, 28 July-8 August 1970.* Vol. I. *Proceedings of the Conference.* Rome. 1971.

[6] Commonwealth Conference on Education in Rural Areas. Ghana. 1970. – FAO Conference on Extension and Rural Youth in Latin America. Chiclayo, Peru. 1970. – FAO *Ad Hoc* Consultation on Intermediate Agricultural Education for Francophone Central Africa. Accra. 1971. – FAO *Ad Hoc* Consultation on Intermediate Agricultural Education for the Near East. Khartoum. 1971.

formal and informal, to support the transformation.[7] Educational inputs may range from new approaches to training and in-service training of technicians to a complete revision of the extension system, and a wider service to farm families to enable them to adjust to new standards of living. The Cadu project in Ethiopia, executed by the Swedish International Development Agency (SIDA), has given rise to valuable data in relation to the problems of integrated development following the introduction of high-yielding varieties.

Educational planning

Educational planning is a relatively new field which needs more research. In 1963 Unesco established the International Institute for Educational Planning but the task is beyond the resources of a single institution and there is a need for more systematic regional research aimed at the development of rural communities. Here there is scope for further assistance from the United Nations agencies as well as from other sources of multilateral aid. Educational planning covers a wide field, including the determination of costs and benefits, methods and criteria of financing, manpower aspects, case studies and the evolution of planning processes. It will increasingly adopt the systems analysis method, along the lines advocated by Philip Coombs.[8]

Until recently experience in educational planning has been acquired by trial and error with little opportunity for objective evaluation. If the waste of scarce resources is to be avoided it is essential for it to be submitted to critical inquiry in order that those responsible for educational strategies may have criteria on which to base their decisions. The importance of such people having received training in the field in which they operate — or having trained people available to them — is obvious, yet expertise in this sphere is still regrettably rare.

The need for research does not stop at the planning stage. It should continue through the whole process and cover the content of courses, teaching methods, training of teachers, the structure of institutions and the even more important area of nonformal education.

As there has been an imbalance in the emphasis given to higher education in contrast to other levels, so there has been overemphasis on formal education to the neglect of continuing education. This needs urgent attention in the next decade: it has a vital role to play in rural development.[9] Institutional education becomes increasingly expensive, and while it is an important link in the educational chain it can never effectively or directly touch more than a fraction of the rural community, save for general primary education. The difficulty about nonformal education is that it depends on personality and generally has no natural physical focus like the institutional buildings of school or college. It has no particular place in the social structure and fits into no tidy programme. It has a place everywhere: youth clubs, associations of farmers, in teaching better family living, in work among dropouts and seminars for cooperative members. It is, or should be, part and parcel of the agricultural extension services.

Nonformal education can meet essential needs not only more economically, but more positively and effectively, than many formal institutions and systems. The question is how best to mobilize its effectiveness. It covers such a wide field that it tends to defy definition. It should have the loosest possible affiliation with government agencies and the civil service machinery. Its initiative must come from the rural community itself if it is to be an effective force, but at the outset it needs guidance.[10]

It is important, too, that the scope of nonformal education and training should be brought to the attention of students of formal teaching institutions so that those planning to take up work in the rural areas are alive to its potential — this applies particularly to those trained for the extension services. The extension worker in a developing country is much more than a communicator of technological data; he should be first and foremost a wise and inspired teacher with a width of vision freed from the constraints of classroom, laboratory and formal curricula.

Priorities

There are so many urgent targets for the next decade that it is difficult to decide upon priorities. Nonetheless, there are areas obviously deserving high priority. Among these is the need for more training and involvement of women and youth in development.[11] Both groups have been overlooked for too long (Table 3-1). In much of the developed world the family unit has lost its identity; in the developing world it is still the critical social unit.

There are a number of countries in which a broader approach is being used in extension work, such as the development now planned in the agrarian reform

[7] In India, for instance, in the community development blocks where high-yielding varieties have been introduced, the personnel of the extension services has been more than doubled.

[8] Philip Coombs. The planning of agricultural education. *In* FAO/Unesco/ILO. *Report of the World Conference on Agricultural Education and Training, Copenhagen, Denmark, 28 July-8 August 1970.* Vol. I, p. 149-151. Rome. 1971.

[9] See Unesco. *Report of the Unesco International Commission on the Development of Education.* Paris. 1972.

[10] In this connexion the present research project on nonformal education for rural development undertaken by the International Council for Educational Development in association with IBRD and UNICEF will be of interest.

[11] See for example: *Study on the access of girls and women to education in the context of rural development.* Paper prepared by Unesco for the 24th session of the United Nations Commission on the Status of Women. 1972.

TABLE 3-1. – NUMBER OF FARM FAMILIES AND ENROLMENT IN AGRICULTURAL INSTITUTES AT DEGREE AND DIPLOMA LEVEL, IN SELECTED COUNTRIES IN THE NEAR EAST AND FAR EAST

	Estimated number of farm families, 1970	Enrolment at degree level [1]		Enrolment at diploma level [1,2]	
		Total	Of which female	Total	Of which female
	Thousands		*Percent*		*Percent*
Afghanistan . . .	2 738	468	0.2	—	—
Burma	3 306	822	17.0	442	1.1
Ceylon	1 328	110	17.3	246	16.3
Iran	3 088	1 732	10.3	257	21.8
Japan	4 356	13 413	5.7	4 260	5.7
Philippines. . . .	3 578	14 434	30.5	567	—
Thailand	4 733	1 668	29.7	536	3.1

SOURCE: Unesco, *Agricultural education in Asia: a regional survey*, Paris, 1971.

[1] Enrolments refer to the academic years 1968/69 and 1969/70. – [2] Junior colleges and other post-secondary institutions below degree level.

in Chile and the integrated approach evolved in some francophone countries in Africa through *animation rurale*. These are both excellent examples of breaking with traditional concepts to achieve the total involvement of the family in the broadest aspects of rural social development.

Curricula in most formal teaching institutions need careful revision and, in many technical institutions, broadening to include socioeconomic and cultural subjects. It will be argued that the syllabus is already too congested. But is it? Is it necessary to continue to teach all the subjects that have been traditionally taught? One still may find examples of university faculties of agriculture in which the teaching of agricultural economics and applied social science has been entirely neglected.

Many formal training institutions, particularly those at the higher levels, are curiously out of context with the rural environments they are supposed to serve. This is a legacy from an earlier period which unfortunately persists, along with the inherent resistance of almost all educational systems and institutions to change.

Postgraduate and senior fellowships for study abroad have made an important contribution to education and training and it is to be hoped that more resources may be made available for this purpose through external aid. But closer consideration needs to be given to their effective use. In the first place it would be a welcome change if such fellowships were extended for in-service training so that the students could bring with them a background of field experience and less emphasis be given to their academic qualifications than to the validity of their experience. The countries and, more particularly, the institutions to which they are sent need careful selection, and moreover need to be geared to the reception of such students so that the experience they gain abroad will be really relevant to their work in their country of origin.[12] Interchange study fellowships between developing countries could often be more productive and promote a direct exchange of experience. The more developing countries can be brought into direct contact with one another the more they will learn directly from each other, particularly through their advanced students. It is hard to appreciate the isolation in which many professionals have to work in developing countries and how little intercommunication there is between one country and another. It is often assumed that in country A the successes and failures in country B are well known and appreciated. In fact it may be only through a chance visit or conversation that a particular project is brought to the notice of a close neighbour.

Planning and organization of national systems

Educational planning is now a discipline in its own right but in practice is too often treated on an ad hoc basis. This is unavoidable when immediate short-term needs have to be met. These often arise from requests for crash training programmes related, for instance, to a particular growing season or to a specific part of a development programme. They usually present themselves in a very convincing manner; training programmes to prepare field staff or farmers to combat against pests and diseases have clearly defined and readily understood objectives. They promise tangible results after short intensive training. Since the objectives are clear and immediate they readily find the necessary support from higher authority, and financial backing.

It is in connexion with the longer term planning of agricultural education and training that the situation becomes complex and where the difficulties of establishing priorities and interrelationships arise. These plans need to be closely integrated with national or regional rural development strategies which, although based on broad, long-term objectives, may be subject to unforeseen changes due to social, political or other pressures. Even if radical changes in objectives do not occur, the dynamic nature of development requires continuous adjustment on the part of the institutions involved in its promotion. This calls for a degree of flexibility in such institutions which is often lacking — and there can be few

[12] In this connexion the UNDP Special Fund Project India 88 operated by Unesco in association with FAO is of interest. This project is concerned with postgraduate training and the aim is to develop links between selected Indian institutions and those in developed countries.

less adaptable to change than those concerned with education and training.

Long-term needs require the setting up of training programmes which will have to run over several years at least and which therefore require personnel, facilities and both nonrecurrent and recurrent budget provisions extending over the time the programme operates. For instance, in a three-year diploma course, from the date the decision is made to establish a programme seven years might pass before the first group of students has graduated. A project of this kind does not begin to pay dividends unless it is allowed to operate for at least a decade, and once established it is difficult for it not to become self-perpetuating. Its very structure in terms of both physical facilities and personnel tends to make it inflexible to change and adaptation.

Another element which distinguishes long-term from short-term training programmes is the frequent need to evolve legislation governing their establishment, their operation and their financial support. The preparation and adoption of such legislation may be very time-consuming and, once adopted, difficult to modify.

Educational planning and organization rely extensively on manpower projections for criteria to determine priorities both in quality and quantity. Such projections, while valuable, have limitations whether they are true projections, extrapolations or compounded estimates. The danger lies in educational policies becoming too rigidly dominated by any form of quantitative projection which is inflexible.

The demand for education is a factor which has to be taken into account in programming: it reflects social traditions and prejudices, and present rather than future opportunities; the latter can scarcely be foreseen by those who create the demand. The importance of this is clearly demonstrable in agriculture and the rural sector generally. Agriculture has suffered universally from being low on the list of educational demand. It is one thing to plan for a hierarchy of agricultural training institutions; it is quite another problem to staff the institutions with teachers who have a real desire to work in them or to find sufficient students to fill them who have a sense of vocation and who will ultimately make an impact at the farm level.

It is common practice to plan agricultural education without sufficient study of the technical personnel needed by farm families at different stages of development. These needs are consequently often established using unrealistic and general ratios (one graduate to four intermediate technicians, etc.).

The whole education system relies for its ultimate effectiveness on the quality and the motivation of its teachers. Schemes which are tidy and effective on paper have little validity unless the teachers have a sense of real purpose in the work they are doing. How are the teachers to be selected, trained and adequately supported? How are the limitations frequently imposed by their urban backgrounds and their lack of sympathy for rural people to be overcome? Do they consciously (or subconsciously) alienate their more intelligent students from their environment? Can better teacher training provide some of the answers and, if so, where are the teachers with vision to be found to teach the teachers?

Teaching in rural areas — often a lonely and frustrating job — should be adequately compensated by improving housing, salaries and career structures. There is much to be gained by being more concerned with the teacher than with organizational charts, syllabuses and physical structures.

In the regional reports presented at the Copenhagen conference constant reference was made to the difficulties caused by the divided responsibilities of ministries of agriculture and of education. Sometimes more than two ministries are involved in rural education and training.

While it may be regrettable that all education does not fall within the province of a single authority there are many considerations which have to be taken into account. Some technical education and much applied research and investigation must come within the purview of a technical ministry concerned with agricultural production, while the need to integrate extension and research work with the broader aspects of education and training is obvious. It is therefore important that coordination over a wide field of rural interests be actively pursued, not only at the headquarters level but at regional and district levels as well.

National councils for agricultural education and rural development are beginning to operate in several countries (for example, in Ghana and Kenya), and potentially have an invaluable coordinating function but only if they have effective counterparts at other levels. If a focus can be found on which the coordination can be physically based, such as an agricultural university or a secondary school, so much the better.

It is important that all rural and agricultural education systems be oriented to development. At the intermediate and vocational levels courses should prepare for specific jobs which respond to defined development objectives. Even at the secondary school level there is considerable scope in the study, for example, of local geography and history to open the students' eyes to what is involved in social and economic rural development strategies. Teaching and research programmes at agricultural universities and faculties should deal in large measure with rural development planning. Study of resources and processes of development should be emphasized rather than the traditional basic sciences.

Economic criteria, manpower planning and employment generation

It is difficult to dissociate the economic from the social and political factors involved in planning rural education and training. With rising investment and recurrent costs, increasing demand for education and the explosive growth of population in developing countries, the economic factors involved necessarily become more pressing. Tables 3-2 and 3-3 show that in most countries expenditure in education has been rising more rapidly than growth of gross national product.[13] There is a limit to what a country can afford to spend on education but any ceiling should be determined more by social and political than by purely economic factors.

It would be interesting to discover what past investments and recurrent costs have been in the rural sector in certain countries over the past generation or so, to see if any significant economic change has taken place in those in which the education sector has absorbed a more substantial part of the general budget. However, it has been shown that little direct relationship can be established between education and production; there are far too many variables involved.

Various attempts have been made to apply economic criteria to analyses of expenditure and education. The argument has been advanced, for instance, that development has invariably induced a slightly greater growth than would be expected from the application of capital/output ratios or rates of return to the level of investment in any given country. This unexplained increment is often taken to be the payoff in education and training, but so simple a deduction must be suspect. Attempts have also been made to apply economic criteria, particularly on a cost/benefit basis, to individual projects, but these have only exceptionally proved useful.

The difficulty is that data are still inadequate to provide valid economic criteria for the assessment of rural educational priorities. Unesco gathers statistics on education such as budget allocations and

TABLE 3-2. – PUBLIC EXPENDITURE ON EDUCATION AS PERCENTAGE OF TOTAL GOVERNMENT EXPENDITURE IN SELECTED COUNTRIES, 1960 AND 1968[1]

	1960	1968
	Percent	
Ivory Coast	15.1	27.7
Liberia	6.6	[2]13.8
Uganda	18.7	12.5
Bahrain	16.9	23.3
Iran	[3]10.0	[2]6.2
Ceylon	[3]14.0	[2]18.9
Pakistan	5.3	5.6
Argentina	[4]23.4	21.0
Jamaica	12.6	15.1
Venezuela	[3]14.9	18.4
Austria	5.5	7.6
German Dem. Rep.	6.2	8.3
Germany, Fed. Rep. of	[5]9.5	10.9
Netherlands	23.1	27.7
Spain	[3]14.3	11.7
New Zealand	[3]10.8	12.4
United States	[3]18.8	16.6

SOURCE: Unesco. *Unesco statistical yearbook 1970*. Paris, 1971.
[1] It would have been desirable to have expenditure as a percentage of GNP for the same years and the same countries. However, for many of the countries listed interesting comparisons are possible (see Table 3-3). – [2] 1967. – [3] 1964. – [4] 1965. – [5] 1961.

[13] A note of caution is necessary when reading these tables. Year to year variations are often substantial and are affected by capital investment included in the total expenditure. Averaging of data over a number of years would be more meaningful but was impracticable for lack of sufficient comparable information. The data are simply meant to give approximate indications of trends and magnitudes.

TABLE 3-3. – PUBLIC EXPENDITURE IN EDUCATION AS PERCENTAGE OF GNP IN SELECTED COUNTRIES, 1955 AND 1968

	1955	1968
	Percent	
Algeria	[1]2.8	[2]4.9
Ghana	[3]2.5	3.9
Kenya	[1]2.5	[2]4.5
Uganda	[1]3.4	[2]2.9
Zambia	0.9	[4]6.2
Iraq	[1]2.2	[2]6.3
Ceylon	2.9	[5]5.0
India	2.0	[6]2.6
Japan	[1]5.0	4.0
Pakistan	0.7	1.4
Thailand	[1]2.9	[4]2.8
Brazil	[1]1.8	[2]1.0
Jamaica	[6]2.1	3.5
Mexico	[1]0.8	2.5
Panama	3.3	4.7
Puerto Rico	5.6	6.4
Venezuela	[1]1.7	4.2
Austria	[1]3.1	4.7
German Dem. Rep.[7]	4.4	4.8
Germany, Fed. Rep. of	2.7	3.6
Netherlands	3.7	6.9
U.S.S.R.[7]	5.8	7.3
New Zealand	[1]3.0	4.3
United States	3.3	5.8

SOURCE: Unesco. *Unesco statistical yearbook 1970*. Paris. 1971.
[1] 1954. – [2] 1967. – [3] 1957. – [4] 1966. – [5] 1965. – [6] 1956. – [7] Percentages of Net Material Product.

number of students per sector [14] and some interesting exploratory work has been done for the FAO Indicative World Plan.[15] This shows that the costs of a greatly expanded output of trained agricultural personnel up to 1985, when expressed as a percentage of a particular country's anticipated gross domestic product, were found to be extremely small and probably decreasing over time. It is to be hoped that in the near future more data will be forthcoming through the work of United Nations agencies concerned in this field, from which more precise economic criteria may be made available.

MANPOWER PLANNING

The need for the introduction of more refined methods of manpower planning cannot be overestimated. At comparable stages in their own development none of the present developed countries were faced with problems of anything like the same magnitude. It cannot be assumed that the necessary flow of trained and experienced people will automatically be available when needed. They must be planned for, and there must be a dovetailing of the output of the agricultural training systems and the implementation of programmes that require this output. Manpower planning is concerned not only with numbers but equally with the content and quality of the training, with the subsequent development of trained personnel and, not least, with their effective utilization. This can easily be lost sight of in manpower planning surveys which have the inherent danger of crystallizing what is in fact a fluid situation.

In the FAO Indicative World Plan studies, detailed estimates of trained agricultural manpower were made, country by country, region by region. These estimates were based on agricultural population and a whole series of ratios were used: for example, those of extension workers to farm families under different farming systems; of senior personnel to field level personnel; of the private sector requirements of trained people to government/public sector requirements, and so on. Assumptions had to be made with regard to wastage or drop-out rates during formal training, for staff replacement rates. Is this an acceptable base from which to proceed or are there alternatives? All these assumptions need to be tested in the field and in individual countries if a really usable manpower planning methodology is to be evolved.

It is necessary to know the training cost per student in every type of agricultural training institution [16] and the drop-out rate (and, if possible, the causes) year by year, level by level and course by course, to arrive at the cost per graduate at each level. The economic consequences of drop-outs have been clearly demonstrated in the recently published Ceylon report [17] in connexion with the "0" level graduate. In an ideal situation with no drop-outs it would require 10 "pupil years" to produce such a graduate. In 1962 in Ceylon it took nearly 80 pupil years and by 1966 this figure had increased to over 100 pupil years. Obviously those who drop out before reaching a certain standard are by no means all loss. On the other hand, if only 10 percent of those who embark on a defined course intend to complete it then it must be concluded that the system is inordinately expensive and hard to justify.

Training institutions need to know what is happening to their graduates: do they find employment and what kind? [18] Does the training given meet the needs of their employers, and if not why not? FAO is undertaking a series of such studies in cooperation with some institutions in the developing countries. These can provide only a small part of the data needed. Every country needs to carry out its own studies to have a basis for manpower planning and training requirements.

It is important to distinguish between estimated requirements and effective demand for trained agricultural personnel. Estimated requirements were never designed for use at the operational level, for example in running extension and related services. Their primary purpose is to indicate the trained personnel needed, as a guide to those responsible for agricultural education and training policy and as a broad pointer to overall staffing levels. Effective demand, on the other hand, depends entirely on the policies and priorities determined by individual governments. Such a strategy should cover: the most effective utilization of all levels of staff; the conservation of existing personnel resources; the improvement of quality as well as expansion of numbers; the provision of adequate opportunities and incentives for advancement, and the coordination of the manpower strategy with other aspects of economic, social and educational planning.[19]

In framing a rural development policy existing agricultural education systems must be reviewed to encourage a progressive reduction in the confusing

[14] Unesco, *International yearbook of education*. Paris. 1970.

[15] FAO, *Provisional Indicative World Plan for Agricultural Development*. Volume 2. Chapter 12. Rome. 1970.

[16] Research by FAO on the cost of intermediate agricultural education in 14 institutions in different countries shows a range from U.S.$405 to $4 945 per student per year.

[17] International Labour Office. *Matching employment opportunities and expectations: a programme of action for Ceylon*. Geneva. 1971.

[18] Unesco. *Agricultural education in Asia: a regional survey*. Paris, 1971. The 1969 percentage distribution of higher and secondary level graduates is given for certain countries in Asia but the required information is far from complete. To quote an example: from the agricultural colleges of the Philippines (1960-1965) 40 percent of the graduates were placed in technical or educational employment but no less than 40 percent were unaccounted for.

[19] For a fuller discussion of these components see FAO. *Provisional Indicative World Plan for Agricultural Development*. Volume 2. Chapter 12, Section F. Rome. 1970.

number of formal training levels and a more effective use of in-service types of training, to get trained men on the job in the shortest time and at the lowest cost per head. There must be the necessary flexibility to meet new and changing manpower needs and more research into the utilization of trained manpower.

The education sector is caught on the horns of a dilemma: it is assumed that it should be able either to anticipate with some precision the expansion needed in a particular sector or to set up a flexible system which can overlap several fields, needing only the final polishing of a year or so to produce the manpower required with the necessary qualifications. In certain sectors the latter is possible. After a basic training changes can be made to a specialized field, for example, engineering, medicine or economics. A certain amount of wastage is unavoidable as the system will never work ideally, but faced with urgent demands for specialists — particularly in the agricultural sector in many developing countries — there is danger that wastage will result from the rigidity of training systems which do not easily permit of interchange from one sector to another. The economic bases of education have little meaning when divorced from considerations of content and objectives, and adaptability to changing needs. Careful and continuous examination of where and why wastage occurs is probably of greater economic importance at the present time than the establishment of basic economic criteria, which must await the much fuller collation of data and research before they can be properly employed.

Employment generation

Nearly all developing countries are experiencing rising unemployment in their modern sectors, irrespective of their national rates of economic growth.

A recent International Labour Office mission in Colombia [20] reports that in 1970 only about 5 million man-years were used out of a total active labour force of 6.5 million. The labour force in the country in 1985 may be close to 11 million (over 30 percent of which in agriculture). Should the recent growth rate in employment continue the total number of jobs in 1985 would only total 7 million, thus leaving 4 million, or about a third of the labour force, unemployed.

The rural sector must continue to be ready to absorb the great bulk of the labour force and must itself be "modernized." But rural modernization demands much more than technical improvements in agricultural production. It calls for the transformation of rural communities, the development of small-scale labour-intensive industries, improved communications, better health and educational services and the infrastructure so long denied to the rural sectors. To achieve such a transformation calls for massive investment which cannot be generated by the rural community alone but may require considerable diversion of financial resources from the urban sector. Such a transformation will demand a wide range of trained personnel for agricultural extension, continuing adult education, community development, youth services and in-service training as well as for formal training.

Some areas of special concern

Training of technical teachers and extension workers

It has been too often assumed that those who have received technical training are competent to teach. Many developing countries, faced with the pressing need to staff agricultural teaching institutions and extension services, make the best of circumstances by finding personnel who appear to have the necessary paper qualifications. Regrettably, they are often pressed into service more by circumstance than by any sense of vocation. Career structures are frequently inadequate with resulting frustration and disillusionment. The basis on which many have received their initial education and training is restricted, frequently founded on the applied natural sciences with inadequate regard for the social sciences. Both the technical teacher and the extension worker need to have their initial training soundly reinforced by in-service training, if they are to have the width of vision and understanding which their subsequent work of interpretation must involve.

There are few indications of plans to provide adequate teacher and extension training at the post-degree or post-diploma levels. It is less a question of setting up new and costly institutions for this purpose than of broadening existing institutions and programmes and following initial training with in-service courses. Indeed, continuous in-service training and retraining is a *sine qua non* in the preparation of teachers and extension workers if they are to be aware not only of technological advances but also of new developments in teaching methods, in the use of mass media, and the major advances in rural development.

In-service training is not a simple question of placing a trainee in apprenticeship to a field worker. The problem is to locate the potential teachers and

[20] International Labour Office, *Towards full employment: a programme for Colombia*, prepared by an inter-agency team organized by the International Labour Office, Geneva, 1970.

then to establish around them, at suitable locations, courses of in-service instruction which combine study in the field and in the classroom.[21]

Training for administration

The increasing complexities of developing rural economies call for new expertise in organization. The replacement of traditional forms of land ownership by consolidated and individual ownership requires a degree of sophisticated administration to carry through agrarian reform and establish the new systems. Agricultural business management, based on a cash economy, needs administrative competence; and marketing boards and cooperative societies call for skilled techniques of a new order. New social services in health, welfare and youth work require administrative expertise as well as technical knowledge. Even at the simplest level, the running of any group such as a cooperative society, marketing organization or youth club demands an understanding of committee procedures, experience in keeping minutes and records and a knowledge of accounting.

There is a strong case for initiation into broad methods of administration even at the first diploma or degree level. In addition to a sound knowledge of administration, those involved in the agricultural and rural support services need to be kept informed of procedures, and changes brought about by legislation. This can be done by in-service training and is as important for workers in the extension services as it is for those in the higher echelons of the civil service.

There is a need for seminars for both senior and junior administrators. There is usually too little vertical contact or dialogue between those at headquarters and those responsible for organization at the operational level.

Teaching aids and communication media

The importance of adequate teaching aids and material scarcely needs emphasis. The teacher deprived of aids and equipment is greatly handicapped and his productivity correspondingly reduced.

In most developing countries, even at the higher levels of agricultural education, there are serious shortages of textbooks, journals, abstracts and laboratory equipment. The student has therefore to rely to a great extent on the lecture, supported by cyclostyled notes which must serve in place of deeper and more exploratory reading. Comparable difficulties are frequently found in the adequacy of laboratory equipment, an essential teaching aid in the sciences. Here, shortage leads to time-wasting sharing of equipment, or makes it impossible for the student to carry out his own experimental work.

At intermediate and lower level institutions, the need for simple textbooks, well written and illustrated, and even of basic manuals, is great.[22] The preparation of textbooks, which in a subject like agriculture date so quickly, is regarded as unrewarding. This is particularly true of developing countries where the aggregate demand is limited and where there is little experience as yet in their local preparation. Consequently, reliance often has to be placed on texts prepared for a different environment, with limited relevance to local conditions.

Contemporary teaching aids extend beyond books, journals and laboratory equipment. There is now a wide and versatile range of audiovisual equipment available which should be more fully exploited. It is hardly necessary to stress how the imaginative use of good instructional aids can enliven and clarify the teaching process. Although equipment is becoming more elaborate its practical operation is increasingly simplified. Such equipment can be a valuable asset for large classes to help maintain student interest. The comparatively high teacher/pupil ratio which obtains in many developed countries can seldom be matched in developing countries and a variety of instructional equipment properly used can do much to compensate this.

Agricultural curricula have not kept pace with the new equipment. Teaching programmes need just as thorough preparation and expertise as that required for the authorship of textbooks. This implies the specific training of agricultural instructors themselves in the relevant and vivid presentation of subject matter. There is also a strong case for establishing regional clearinghouses for information on the location and availability of instructional materials relating to agricultural education and training in the developing countries.

The whole field of teaching aids, equipment and media is one which invites more bilateral and multilateral aid, not simply in terms of physical supplies, but also in the training of technicians to maintain the equipment and to guide teachers in its use.

With growing appreciation of nonformal educational methods, it is necessary to look at the potential of mass media: the press (in literate communities) and, notably, radio and television, which deserve close study in connexion with rural development. Radio

[21] In-service training for extension workers is carried out in a number of countries. In Lebanon, for example, courses of seven to ten days are organized every three months for the country's extension workers. The activity is more difficult to organize in larger countries.

[22] The enthusiastic welcome given to a series of simple texts in French relating to agricultural production and science, issued by the Institut africain pour le développement économique et social (INADES) in Ivory Coast, and recently by FAO (Better Farming Series) in English and Arabic, has been striking evidence of this.

is steadily spreading its influence in a public service context, thanks to the availability of transistor sets, and recent experiments with educational television in Niger and Ivory Coast, for example, have been watched with considerable interest.

With the development of communication via satellites (e.g., Telstar), already envisaged for India and Brazil in the next few years, one can reasonably expect these media to become an influential force in promoting rural development in the future. Here again the supply of programme material relating to development is likely to prove a limiting factor unless positive and timely steps are taken to prepare it.

While literacy arising from primary education falls outside the scope of the present review, the importance of adult literacy which is basic to nonformal education and training cannot be overlooked.[23] In this context attention must be drawn to the advancing techniques of functional literacy advocated by Unesco.[24] Despite the appeal of films, television and radio, communities must increasingly communicate by being literate. Nearly 800 million persons in the world are estimated to be still illiterate.

School teaching and rural development

Educational strategies, particularly in developing countries, seem to have been so much oriented toward secondary and higher education that they have been formulated on the assumption that the education process is a continuing one through primary and secondary levels to the final goal of the university level. Thus those who fail to make a particular grade on the school ladder are in effect the dropouts of the system. Furthermore, there has been a strong school of thought that primary, and to a considerable extent first level secondary education, must be undifferentiated; that there should be no fundamental difference between the general education given in the urban and nonurban sectors and that to do so would be to place the rural child at a disadvantage.

There is every indication that general educational policies are now being reconsidered in the broader context of national development strategies. The ending of formal education for large numbers of young rural people at the completion of primary school is the greatest challenge of the next decade facing the educational planners. Ways have to be found whereby the primary school curriculum can become a meaningful entity in itself, a preparation for a useful life in a rural community. As this change of attitude is achieved the secondary system will have to adapt itself to a new kind of entrant, less scholastically advanced but compensated in many other ways.

There have been interesting developments in practical nonformal education in Tanzania where only a small proportion of primary school leavers are admitted to secondary schools. This policy has been forced upon the country because of forecasts of the numbers of trained personnel which can be absorbed by the economy in the medium term. This has implied a change from the traditional curricula of primary schools to more practical goals.

In the same way, those countries with more secondary school leavers than can be absorbed into further education or training, or into direct employment, will need to reorient the secondary school curricula to make certain aspects of it directly preparatory for work in the community. This will probably be achieved by the splitting of secondary schooling into two cycles, the first being terminal and the second preparatory for higher education, as is now the case in Mexico and Peru. This in its turn will no doubt result in the lowering of higher education entrance standards, but if the gains more than compensate for any losses this need cause little anxiety. It will then be for institutions of higher education and training to make provision for a compensating preparatory year which may prove to be a useful sieve for further selection.

If it is accepted that in the forseeable future most rural children will return to family farms and associated occupations at the end of their period of general education, are there not strong arguments for including in such educational systems means whereby they may be more specifically and effectively equipped for the way of life they are to assume on leaving school? Is there not considerable justification for using the school syllabus for more teaching about the environment, about agriculture and its related natural and human sciences, about human health and nutrition and possibly even some of the simpler concepts of community development? These are subjects which the imaginative teacher can make immensely real if the learning is based on "doing" — if the school can be taken to the farm and into the village. Similarly, practical skills related to the urban environment should be introduced in urban schools.

However, the school garden or small farm, although started with much enthusiasm, can rapidly become the very antithesis of a teaching aid in inexpert hands. It can defeat its object by reinforcing in the children's minds an antipathy toward their enforced rural environment. Yet if formal education is to help the next generations to play an active part in rural development, the environment, agriculture and related studies will have to be included as more relevant curricula are planned for primary and first phase secondary schools. Such subjects require prom-

[23] The *Unesco statistical yearbook 1970* reports illiteracy rates for selected countries in Africa as high as 98 percent, and few countries in Africa (with a large population) have rates lower than 50 percent.
[24] See Unesco, *Functional literacy*, Paris, 1970.

inence throughout the whole curriculum, and should not be isolated to a minor section.

The difficulty lies in the acute shortage of teachers with sufficient vision or training. A good curriculum is quickly made a mockery of in unwilling or inadequately trained hands. Many rural school teachers have urban backgrounds or aspirations and too little understanding of the rural environment which, with adequate textbooks, wall charts and the very simplest experimental equipment, can provide a comprehensive and satisfying basis for elementary education.

Training in special fields

In a necessarily general review of education and training for rural development it is naturally not possible to deal in detail with such special fields as fishery, forestry, nutrition, food technology and other skills directly associated with the development of the nonurban sectors. In such fields training is often required for relatively small numbers and at higher levels. Few developing countries can justify the heavy capital investment involved in equipping and staffing small national institutions, and may have to depend on training abroad for certain categories of personnel, usually in developed countries. Increased use should be made of facilities, where these exist, in other developing countries in the same region: some may be in a position to receive foreign students and give them adequate training. Existing institutions may need to be strengthened in order to be in a position to serve the region, but such measures are generally more economic and easier to achieve than the establishment of an international specialist training institution. Attention should be given also to the possibility of conducting temporary specialist courses, provided teachers, equipment and accommodation can be made available for the required period at a suitable institution.

Out of some 10 million fishermen in the world probably some 8 million are small-scale subsistence fishermen almost completely untouched by any formal education. These represent a group of underprivileged people whose status is even lower than those engaged in subsistence agriculture. Generally they live in remote areas where schooling facilities are lacking or at best extremely inadequate. Their job is dangerous and their working conditions are typically bad. It is largely through extension work and community organizations such as fishermen's cooperatives that their economic and social difficulties can be alleviated and improved. The forthcoming FAO consultation on fishery education and training to be held in Rome in 1972 should do much to resolve the problems of longer term strategic planning. The limited resources available must be devoted primarily at the intermediate level to the training of skippers, engineers, instructors for vocational training schemes and extension workers. It must be appreciated that with more sophisticated fishing methods there will inevitably be a reduction in the numbers able to find a livelihood in fishing.

The forester, fisherman and farmer are traditional husbandmen of natural resources and are all faced with new sophisticated techniques involving them in new patterns of life, new decision-making and new unaccustomed risks as well as rewards. The education and training to equip them for these are basically identical.

On the other hand, the specialist training of those involved in the new applied sciences such as nutrition, food processing, small machinery maintenance and so on owes little or nothing to traditional skills. Yet these specialists, like all extension workers, have to be trained as much in human psychology and how to approach the families they serve as in the details of their technologies. Consequently extension workers in nearly all rural fields should be trained together, not in isolation.

The organization of extension work

Difficulties frequently arise from the number of departments involved in extension work. There may be several ministries, departments and authorities each with responsibilities for running rural extension services of one kind or another. Farm advice may be the responsibility of one, home economics of another, cooperation and marketing of another, youth work another, land settlement yet another, and so on. One of the reasons for the proliferation of independent extension services has been the frequent frustration suffered by commodity boards and other agencies in attempting to get government-controlled services to cover some of the broader aspects of rural development. It is exceedingly wasteful, and confusing to the farmer client, to have a number of extension workers in contact with him each pleading their particular suit; on the other hand, to expect a single extension worker to be capable of successfully operating over the wide field of rural development is also unreasonable.

The functions of an extension worker in a rural community are necessarily varied. Technical expertise is initially less important than the ability to establish human contacts. This demands experience, infinite patience and, above all, a capacity to establish confidence between the field worker and the farm families. Unfortunately, as for other training personnel for rural areas, few want to be field extension workers — and for the same reasons. The job lacks status, it usually lacks decent career prospects

and invariably means living a lonely life in remote and backward areas.

In a number of intermediate schools and colleges, and also in university faculties, courses are now being taught on extension methodology. Even although principles must be taught, it is difficult, if not impossible, to give extension workers a real knowledge of their work at college or school. It must be taught by those with first-hand experience acquired in the field. The classroom and laboratory of the extension worker are the village and the field, and effective extension training can only be done properly in the rural community. In other words, it is primarily through inspired pre-service and in-service training that competent extension workers will be produced. Continuous in-service training permits those working in the field to be frequently brought together for group meetings and for refresher courses to exchange experiences and to acquire new skills in their subjects and in communication. Such refresher courses can do much to overcome the sense of isolation to which the lonely worker so easily falls victim.

There is a need, too, for a greater degree of district and area coordination through senior extension officers who can help to make the efforts of less experienced workers more effective and integrated. The field man must not only have been properly trained for his job; he must be given proper support in the field to carry out his work effectively, and adequate transport to make him mobile.[25]

Few, if any, developing countries can afford extension services which adequately cover every farm family and fewer still could find the trained manpower to do so even if they could afford the costs. In practice the coverage, in its present form, is almost invariably grossly inadequate (Table 3-4).

More needs to be known about how to make the most effective impact with limited resources. This may involve new concepts about how best to reach the farm family, as are now being tried in some agrarian reform areas. Increased attention must be paid to the role of farmers' organizations in spreading the work of formal extension on a horizontal plane. More thought also needs to be given to training, to systems that facilitate collaboration between all rural development extension services, and to improving the status of the field worker on whom all such services ultimately depend. There is often an inadequate communication of research results to extension workers. It is essential that the field worker be able to effectively communicate with his remote headquarters, which usually needs to be better informed about his work, his needs and his problems.

[25] For instance, in Ethiopia the extension worker is still largely dependent upon the mule or donkey for transportation, which seriously limits his range of action even if there are compensations from closer contacts with his clients. In one Near East country, extension workers in a land settlement project in 1968 rarely reached the settlers because of lack of transport.

TABLE 3-4. – ESTIMATED EXTENSION WORKERS AND FARM FAMILIES IN SELECTED COUNTRIES,[1] 1971

	Farm families	Extension workers	Farm families per extension worker
Mali [2]	936 444	111	8 436
Senegal [2]	448 333	206	2 176
Uganda [3]	1 432 200	125	11 458
Zambia	470 000	560	839
India [2]	53 594 242	64 720	828
Korea, Rep. of [3]	2 506 000	[4] 3 628 [5] 6 049	[4] 691 [5] 414
Argentina	1 074 883	239	4 497
Bolivia	571 600	70	8 165
Brazil	8 624 902	[6] 1 556	5 543
Chile	389 206	368	1 057
Colombia	1 832 453	350	5 236
Costa Rica	140 000	37	3 784
El Salvador	351 090	61	5 756
Guatemala	627 170	40	15 679
Honduras	323 653	51	6 346
Mexico	4 858 461	514	9 452
Nicaragua	169 531	38	4 461
Peru	1 330 000	558	2 383
Venezuela	559 811	272	2 058

[1] The sample is heavily drawn from the Latin American region because of a recent study on the subject. Data on other countries of Africa, the Far East and the Near East were hardly comparable and were therefore not included. As far as possible, only extension personnel in direct contact with farmers were included. – [2] 1967. – [3] 1965. *The economy of Korea*. Vol. 3. Seoul. 1966. – [4] Includes only general guidance workers (village level). – [5] Includes also subject specialists of agricultural extension (excluding provincial and national levels). Most are in direct contact with farmers. – [6] Includes veterinarians and other technical staff not directly dealing with agricultural extension.

INVOLVEMENT OF YOUTH IN DEVELOPMENT

In developing countries the age group between 12 and 25 represents an average of about a third of total population. This sector as a percentage of population will reach its maximum in the next decade but, in absolute numbers, it will have doubled by the end of the present century. The great majority of these young people live in rural areas and it is rural youth that is most disadvantaged. Current trends suggest that the creation of new wage-earning jobs will fail to keep pace with the increase of new entrants to the labour market and that the rural areas will be particularly hard hit by unemployment, which will be further aggravated in many countries by increasing pressures on land resources. In sheer numerical terms alone they constitute a tragic waste of human resources because most are uninvolved in development.

The dilemma which confronts governments and international organizations in the establishment of effective youth programmes is one easy enough to state but for which solutions are extremely difficult to define. It is made worse by the constant pressure on all concerned to find simple solutions to complex problems. The sheer scale of the unemployment and underemployment problem has forced the issue and led, for example, to the setting up of the ILO World Employment Programme and to the call of the United Nations for more massive youth programmes. But such plans cannot lead to a solution if the problem itself has been defined only in terms of youth.

There is in fact a specific youth problem far greater and more fundamental — that of the balance between social and economic development objectives. There is a real danger that many forms of social welfare services, of which some types of youth work are outstanding examples, may tend to blind authority to the underlying socioeconomic issues. Superimposed solutions no doubt have a part to play in drastic situations but they can never get to the core of the matter.

Before other extensive youth programmes are launched there should be more careful study of educational philosophy, practice and objectives. Less than half of the young people in the third world receive some sort of education and training, and the problems now being created are already far-reaching. Are the existing educational concepts those which the youth of the third world need to equip them to become involved in the community? The problem cannot be viewed in isolation.

Training in technical assistance

Until recently it was assumed that given a project blueprint it was only necessary to assemble a group of technical experts to bring it into action. The project team would then function well and the predetermined objectives would be achieved. With the more careful evaluation of the costs and benefits of international and bilateral development efforts it is now clear that earlier oversimplified assumptions regarding the formation and operation of project teams were based on inadequate premises. Selective recruitment may result in the bringing together of a number of highly skilled individuals but gives little or no assurance of producing a well-knit team under experienced leadership. Without such leadership and the sense of direction and coordination of effort which it induces there can be little hope of a group of individuals becoming an effective operational team. The recognition of this has led to a more careful selection and training of project managers. The acceptance that management skills can be greatly enhanced by intensive training has encouraged FAO to embark upon the process of project manager training.

Initially, project manager training was seen as a matter of providing managers with a series of seminars or workshops at which administrative and managerial problems could be examined and recommendations developed. Now plans are for the early introduction of specific training courses in project management. However, it would be unfortunate if this recognition of the need for management in any way led to the neglect of the requirements of project staff for continuing training. It is well known that many technical subjects taught at universities are outdated within five years. It is therefore important that study leave and refresher courses be introduced for all higher grades of technical staff to enable them to keep abreast of new developments.

Now that the United Nations agencies are initiating training in project management and making provision for the continuous retraining of managerial and technical staff, it is to be hoped that parallel developments will follow for the intensive training of counterparts, on whom devolve the eventual responsibility for the projects initiated by multilateral and bilateral aid.

Throughout much rural development project work trained and experienced management and leadership have seldom been accorded the importance they should have. Adequate briefing prior to assignment, on assumption of duties and continuously throughout the operation has too often been neglected. A man may have considerable expertise in a particular field yet be singularly lacking in managerial ability, in leadership capacity or even in competence to work as a team component.

Considerable impact would be achieved by devoting more of the limited aid resources available to the better training of administrators, managers and operating technicians so that both external aid and internal allocation for development may be employed with greater efficiency. If this is to be effective a considerable change in technical assistance is to be looked for; it will have to become more oriented to training specifically for development and less with giving support to general technical education and training.

Those responsible for the allocation of aid resources must give the most careful and objective consideration to the areas in which these can be most effectively applied. Constant reappraisal is called for if decision-making is to be prevented from following a conventional pattern, without due attention to experience gained, changing needs, and newly available skills. Business management is an outstanding example of such a new skill which has widely ranging implications in rural development.

Conclusions

There is now widespread recognition of the role of education and training in the development process, and equally of the major issues which face governments in structuring education and training for rural development.

Yet the speed of change appears to be slow. Plants do not grow while they are watched, and it is possible that those involved in the development of education and training may fail to see the real progress in fact being made. But taking a detached view it is difficult to be satisfied with either the rate or type of progress. Every succeeding year sees the publication of more and more reports and more and more advice. Without doubt the intentions are there on the part both of governments and international agencies, but are results being achieved at a speed and in a content which will enable the lives of rural people to change fast enough to meet the challenges of today and tomorrow?

In defence it might be said that we think we know the answers but too often do not know how to start the processes in which the answers are involved and the order in which they should come. Education alone can achieve very little unless it is part of a development package. Its exact place in the package varies from situation to situation. Perhaps it is in launching the total package that we are failing. Perhaps too few governments have been able to cut through the tangled administrative structure or cope with increasing urgent priorities in order to make a multidisciplinary approach to their rural problems. Many indeed have been forced to put the rural sector too low in the scale of development priorities.

Even if such excuses are valid they are not satisfactory, nor do they constitute an answer with which we can be content. There is mounting evidence that rural educational systems are really failing to meet needs and there is no justification for complacency if we are to face with determination the urgent issues of the Second Development Decade. The problems may be summarized as follows:

1. Despite understanding of the need to integrate rural education and make it an instrument of development objectives, there are still too few examples of it happening.
2. Continual stress is placed on the planning of national systems of agricultural education and training, but in practice few are yet planned.
3. The advantage of national coordinating councils for agricultural education and training has had wide support and yet few have been formed.
4. Effective manpower planning is regarded as essential in the programming of education and training but few developing countries have any realistic manpower planning for the rural sector.
5. Trained manpower needs should be related much more directly to the farm structure and requirements at the farm family level but we still tend to work from such theoretical ratios as numbers of farmers per extension worker, etc.
6. Reports repeatedly stress the desirability of developing less formal types of education and training but too little pioneer work has been done in this field.
7. Flexibility is accepted as essential if rural education and training systems are to be adaptable to changing needs but there are few systems with the requisite degree of flexibility.
8. Despite the increase in the number of training institutions the shortage of trained technicians continues to be serious in many countries.
9. There is full awareness of the acute nature of the rural youth problem. The total numbers involved grow continuously but satisfactory solutions remain to be found.

While these examples may represent too gloomy a view of the situation there is clearly no cause for complacency and governments and agencies must realize that the situation is far from satisfactory. It can even be argued that the agencies themselves have concentrated on the wrong areas; for example, on the development of educational institutions rather than on the fundamental aspects of the problem. Farm family/extension worker ratios and student/teacher ratios are still being applied which were current a decade ago, and despite the advances that have been made there is still a shortage of factual data on which to base advice. There is indeed a tendency to promote standard solutions for supposedly standard problems.

Imported systems and the failure to create new institutions related to the individual structural and cultural needs of countries in the developing world are constantly criticized. Yet much education is based on emulation, and when we seek examples the Land Grant Colleges of the United States, the Folk High Schools of Denmark or the Land Settlement Association of the United Kingdom seem to offer ready advantages by virtue of the fact that they have been proven by time. In the beginning they, too, were often thought of as revolutionary; respectability developed with age. Sometimes such models no longer fit the country in which they were developed and frequently are quite unsuitable for countries at a very different stage of development which usually lack the necessary infrastructure to support them. Perhaps the indigenous examples of the third world which seem to hold out promise of hope, the Ujamaa villages of Tanzania, the *animation rurale* of francophone Africa or the agricultural universities of Asia, will in time give the same impres-

sion. At least for today they offer an appearance of achievement and are valuable innovations.

Perhaps the time scales are confused. Many expatriates involved in the advancement of rural education in the developing world have come from more tranquil backgrounds. Development, from being a fairly leisurely process in Europe and America, is in the process of becoming, in the developing world, a headlong rush. The stages of educational development undergone by the advanced countries have to be telescoped and in the process perhaps considerably reorganized. The premium traditionally placed on elitist standards may have to disappear at least for some generations. Approaches as yet not seriously considered may have to be made to the problems of improving the lives of rural populations. Much that seems to have been achievement in the laying of solid groundwork to the educational system may prove to be too expensive and too cumbersome to reach the necessary goals in developing countries.

It does not help that educators are normally conservative in outlook and are slow to change and to accept the need for change. Educational systems, too, are everywhere backward looking. Development decisions are usually political, and do not always give the impression of a logical approach to problems in the educational sector, with the result that traditionalists become more entrenched. Yet at the farm level the situation grows daily more critical with less effective training for the population, more unemployment and no immediate solutions in sight. Also, some of the education given is of the wrong type and actually aggravates unemployment.

Much interest has been shown in the developments that have taken place in eastern European countries since the second world war in breaking away completely from the traditional educational patterns, often with considerable success. These systems have been characterized by a willingness to change and adapt even if they proved inadequate, as they frequently did. More recently there has been increasing interest in the changes that have taken place in Cuba and China, which would seem to offer interesting examples for many countries. Adequate information about events in China is lacking, but it is evident that while both countries have had their problems they have begun to develop systems closely adapted to the needs of the moment and they have not been afraid both to experiment and to change in the light of experience. It is notable that in both countries education has been seen as part of a revolutionary rural development process with very positive aims.

It may seem reasonable to believe that under the totally different (in western terms) economic and social pressures of the developing world, and under the urgent stress of the need to achieve results, the existing concepts of educational systems will never achieve the desired results either at sufficient speed or at an acceptable cost. Speed, on account of the need for social justice and cost because few countries can afford to emulate the rich in conventional educational coverage. The prospects of bringing the many government departments together to work across a broad front with sufficient speed sometimes seems too daunting to tackle. Nonetheless solutions have to be found which achieve results more quickly and show the prospect of raising living standards within reasonable time if massive rural unrest is to be avoided.

The solution may therefore be to press continually for innovation on a much wider scale. Agrarian reform, for example, immediately shows up the weaknesses of the established educational system which turns out people to fit totally different social conditions. Agrarian reform also has a habit of being total, for it does not stop with the redistribution of land or the abolition of restrictive tenures but leads to a changed structure of society. Should not a serious attempt be made to develop educational systems in the context of agrarian reform which break with the established conventions? A boldness of approach to rural education is now required both by governments and international agencies. There is an excellent chance for innovation to stem from the catalytic action of aid.

But mere innovation is not enough. It must go hand in hand with research and experiment — particularly with the dissemination of experience, although the time is past when lack of data can be used as an excuse for delay. The only way to find out what kind of extension agents are needed in a given area is to go out and try. Such an approach will require experiment both in the training of the extension workers and in the methods of extension work itself and should not stop short of trying totally new techniques. There will doubtless be failures but there will also be successes and both should be analysed with equal care. Unhappily such experimentation, which may require a free hand to ignore existing systems and structures, never fits well into established government patterns and is therefore not always welcome.

The involvement of people in their own development is now accepted as essential, and education which has this aim is necessary for the rural sector. Any suggestion of limited access to resources or elite creation may sooner or later be strongly resisted. The planning of rural education and training must therefore not be considered exclusively in the light of immediate needs, which in all conscience are urgent enough, but in terms of the aspirations of rural people 10 or 20 years hence which may be very different and even more urgent.

Chapter 4. - ACCELERATING AGRICULTURAL RESEARCH IN THE DEVELOPING COUNTRIES

This chapter deals mainly with the contribution that agricultural research [1] can make to the solution of the problems facing the developing countries, drawing on lessons of the past. It examines the potential created by recent decisions to strengthen international support for such research through the establishment of the Consultative Group on International Agricultural Research, and suggests where priorities for this support might lie in the light of certain defined criteria, including resource availability. Finally, it attempts to indicate how existing and new resources might most effectively be linked in order to maximize the impact of agricultural research and related activities and to achieve multiplier effects of the results of those activities.

In analysing factors contributing to rural progress in India, Mellor [2] has stated: "The obvious lesson is that the first step in an agricultural development programme should be the initiation of a substantial, highly integrated research programme, directly connected to farm problems at one end, and to basic research and foreign efforts at the other."

Awareness of the relation of research to development has not been easy to awaken because of fallacies about the easy transferability of existing technology and misconceptions about the nature and practical value of research. Another obstacle is the communications gap between scientists, politicians, and the general public. Many people confuse research (which has been described as "know-why") with technology ("know-how"). Scientists are blamed for not having vision — which would amount to clairvoyance when technology such as the internal combustion engine produces unforeseen effects. Others think of research purely in terms of fundamental science, whereas the bulk of agricultural research has — or should have — practical and well-defined goals.

A recent national seminar in the United States,[3] while blaming scientists for not being "consumer-oriented" (a charge which the recent furore in the United Kingdom over the Rothschild report[4] seems to support), also pointed to the difficulties of conveying the purposes and value of agricultural research to an increasingly urbanized society. This emphasizes the need for scientists and research workers to be more sensitive to public opinion and to have an effective dialogue with planners and politicians if they are to get support for their programmes and willingness to implement the results. There is thus a need for education of both the scientific community and the public to improve mutual understanding.

To clarify what is understood by research it may be valuable to make certain distinctions at the outset. A classification covering the broad field of science and technology has been worked out cooperatively by the Organisation for Economic Co-operation and Development (OECD), the Council for Mutual Economic Assistance (CMEA) and Unesco in what has become known as the Frascati Manual.[5] This defined four main classes of activity:

1. Research and experimental development (R and D)
2. Scientific and technological services (STS)
3. Education and training
4. Application of science and technology in the production of goods and services

While this paper will deal principally with the first two classes, it is important to note that recent thinking in relation to international support for research in the developing countries stresses the need to regard research and research support activities as part of a chain, of which training is an essential link to increase national capacities for research, and with application as its end point.

R and D are defined in the classification outlined above as: "Creative work undertaken on a systematic basis to increase the stock of scientific and technical knowledge, and to use this stock of knowledge

[1] Agricultural in the sense of "farming," that is, crops and livestock, rather than forestry and fisheries, or nutrition.
[2] Mellor, J.W. *et al.*, *Developing rural India*, Ithaca, N.Y., Cornell University Press, 1968.
[3] *Proceedings of the National Seminar on Agricultural Science Communication, Arlington, Va., 1971.* Washington, D.C., U.S. Department of Agriculture.
[4] United Kingdom. *A framework for government research and development.* London, HMSO, 1971. Cmnd 4814.
[5] Document DAS/SPR/70.40. Paris, Organisation for Economic Co-operation and Development, 1970.

to devise new applications." It is usual to subdivide this broad definition into basic and applied research, and a succinct description given by Robinson [6] has been slightly adapted as follows:

Uncommitted or pure basic research – undertaken out of interest to gain new scientific understanding and with no specific practical application or objective when started.

Project or mission-oriented basic research – undertaken to discover new principles or to better understand or explain basic processes oriented to a specific field of interest.

Project or mission-oriented applied research – directed to advancement in agricultural productivity, through efficiency and quality.[7]

Experimental development – (the "D" in R and D) is not defined by Robinson, and is frequently misunderstood as implying the whole process of development. In fact, it has a special connotation and should probably only be awarded a small "d". This is defined in the Frascati Manual as: "The use of scientific knowledge to produce new or substantially improved materials, devices, products, programmes, processes, systems, or services."

Finally, scientific and technological services (STS), which are closely related to R and D, are defined in the Frascati Manual as including:

scientific library and information services;
scientific testing and standards services;
museums, zoological and botanical gardens;
technical and scientific advisory, consultancy and extension services, including patent offices, and related activities;
feasibility studies (for example, for engineering projects);
general purpose data collection (for example, on the natural environment and land use), which includes routine mapping and geological, geophysical, hydrological, meteorological, oceanographic and natural resource surveys.

Advances in agricultural technology and their impact on developing countries

A comparison between the state of agricultural technology before the second world war with the situation a quarter of a century later shows that a technical revolution has occurred which is perhaps unparalleled in history.

This arose directly as a result of pressures to increase self-sufficiency in the warring nations, with consequent injections of capital into agricultural research and subsequent development, and indirectly from the massive basic research effort directed at chemical and mechanical warfare. Among the major technical innovations made possible by research undertaken during or immediately after the war were the development of systemically acting "selective" herbicides and insecticides, the whole range of chlorinated hydrocarbon and phosphorus-based pesticides; the application of radiation and chemical techniques to induce mutations in plants and in pests; the use of sonic methods in water exploration and in sea fishing; other great advances in land and water resource survey methods resulting from a combination of improved photographic equipment and progress in aerospace technology, culminating in remote sensing; improvements in farm machinery and methods of traction for seeding, fertilizer placement, cultivation, crop protection (including aerial spraying) and harvesting, resulting in increased yields and much higher output per worker; "factory farming" of livestock based on better disease control, automation, and computerization.

Changing patterns of consumer demand both in food products (freezing, freeze-drying, prepacking) and in relation to industrial or export crops have generated research and changes in technology not merely in end uses but right back to the breeding of special varieties, suited to particular consumer requirements or manufacturing specifications. The Canadian work on breeding oil rapeseed varieties with different fatty acid compositions to meet varied and specific end uses is an outstanding recent example.[8] This, as with certain other significant advances in plant improvement, has been made feasible not only by improvements in breeding techniques, but by teamwork between breeders, chemists, and physicists using new equipment and screening methods such as chromatography and protein autoanalysers.

Swaminathan[9] has shown a timetable of the widespread introduction of some of these innovations (Table 4-1) relating to crops, and has pointed out that countries which have taken advantage of them are now in some instances faced with surpluses while those which have neglected them are fighting for food self-sufficiency. It might be added that advances in agricultural science have, by and large, enabled developed countries to meet the needs of rising populations and in some cases to expand agricultural exports from a static or even slightly

[6] Robinson, J.B., *The organization and methods of agricultural research*. London, Ministry of Overseas Development, 1970.

[7] Moseman, A.H., in *Building agricultural research systems in the developing nations*, New York, Agricultural Development Council, 1970, suggests that both "protective" research to maintain the momentum of existing advances in wheat and rice production and "adaptive" research to extend it to additional growing areas are needed.

[8] Downey, R.K., Towards an improved rapeseed. *Agricultural Institute Review*, 21 (2): 16-18, 1966.

[9] Swaminathan, M.S., Agricultural evolution, productive employment and rural prosperity. *The Princess Leelavathi Memorial Lectures*, Mysore, 1972.

TABLE 4-1. – SOME SIGNIFICANT INNOVATIONS IN CROP PRODUCTION, AND DATES OF THEIR WIDESPREAD ADOPTION [1]

	Year of widespread use
Hybrid maize	1933
Chlorinated hydrocarbons for insect control	1945
Minimum tillage	1945
Foliar feeding	1945
Direct application of anhydrous ammonia	1947
Chemical weed control	1951
Systemic biocides	1953
Hybrid sorghum	1957
Dwarf wheat	1961
Dwarf rice	1965
Opaque-2 maize (high lysine)	1965
Hybrid barley	1969
Hybrid cotton	1970

[1] Taken from Swaminathan. M.S.. *op. cit.*, with some time modifications.

declining arable area. However, it is not only output per hectare that has improved, but also output per man, particularly in the developed countries. Sturrock[10] has calculated the increase in productivity in England and Wales resulting from mechanization during the 50 years between 1913 and 1963, and has shown how the combination of new technology and economic pressure has accelerated the pace of substitution of capital for labour (Table 4-2). This process is still continuing in most developed countries, with a concomitant increase in farm size, often with substantial government technical and financial assistance to farmers willing to reshape their farms to facilitate the use of modern equipment.

Over a parallel period considerable progress was made in some aspects of agricultural research in developing countries, but it was more narrowly focused and the extent to which most farmers were unwilling or unable to adopt the technological innovations developed through research in the more advanced countries is well illustrated by reference to the use of the material inputs on which agriculture now largely depends (see Chapter 1, Sources of growth).

About 80 percent of pesticides, for example, are used in developed countries on only 30 percent of the world's arable area; there are also sharp contrasts with developing countries in the balance and objectives of their use. In developed countries the emphasis is increasingly on preventive pest and disease treatments (seed dressings, etc.), on herbicide use,

[10] Sturrock, F.G. Economic aspects of mechanization in advanced countries, *The Advancement of Science*, 23: 171-177, 1966.

TABLE 4-2. – INCREASE IN WORK ACCOMPLISHED PER MAN EMPLOYED IN AGRICULTURE (ENGLAND AND WALES)

Period	Index	Increase per year	
	(1933=100)	*Percent*	
1913	101		
1933	100	—	Stagnation
1938	111	2.2	Beginnings of mechanization
1948	115	0.4	War and postwar
1958	139	2.4	Progress resumed
1963	166	5.4	The pace quickens

SOURCE: Sturrock, F., *op. cit.*

and on application to food crops and pasture; in developing countries most treatments are curative, and applied to export crops, while herbicides are rarely used.

Despite the low absolute levels of use, the growth of input consumption in developing countries has been quite rapid. The reasons for this upswing, which has occurred mainly in the last five years, will be discussed later, but until the mid-1960s the application of western-based scientific technology was principally confined to export and industrial crops. This was to some extent the result of substantial backing from industries using these commodities, partly because it was easier to finance research on such crops (rather than food crops) from cesses on producers, merchants or exporters, and partly because of a structure of large holdings in some of the main producing areas which facilitated the use of inputs. There were also clear cash incentives to improving yields and quality.

As a result yields of crops such as cocoa, tea, rubber and oil palm have risen substantially, unit costs of production have fallen despite increasing use of fertilizer and other chemicals, quality has increased, and the range of end uses widened. That these gains have been patchy countrywise, and offset in some cases by competition from synthetics, or from increased production in developed countries (for example, soybeans), or by falling prices as a result of inelastic demand, does not detract from the merit of the achievements which showed that research could be undertaken effectively and its results adopted by producers in developing countries.

Research on food crops and livestock (particularly ruminant livestock) did not have corresponding success.[11] Progress was made in animal disease

[11] In the 1960s the most outstanding result of applied research was the control of the desert locust, which involved the use of sophisticated equipment and trained staff, and was the outcome of a combined effort involving considerable international aid and cooperation between FAO and developed and developing countries. Research continues to supply increasingly effective controls to meet the threat of this international plague.

control, both through adapting results of work in developed countries, for example, on Newcastle disease of poultry, and from research undertaken in the developing countries themselves, for example, on producing a rinderpest vaccine. Where such work has made it possible to adopt intensive production techniques, as in pig and poultry production, it promises cheaper meat supplies, provided capital and managerial skills can be mobilized. Where these conditions cannot easily be fulfilled, as with most ruminants, progress in increasing output has been disappointingly slow and research problems remain in respect of both health and management.

A somewhat similar situation existed for major staple crops until very recently. At the national level, yields of most food crops rose only slowly despite national research programmes which sometimes showed impressive results experimentally. It thus began to be argued that increased expenditure on research was unproductive; what was needed was the better use of existing knowledge through extension programmes to spread the adoption of modern technology by farmers. The fallacy in this argument lay in the fact that existing genetic material was on the whole not sufficiently responsive to fertilizers and other inputs to permit a successful outcome from such a strategy; indeed some farmers who adopted them lost money as a result. In addition it has proved difficult to maintain stable farming systems on some tropical soils, even with high use of modern inputs. The seeming inability of any agricultural strategy to push food production ahead fast enough led development planners in some countries to concentrate resources on the industrial and service sectors and to despair of agriculture as a basis for growth. The failure was of course blamed on the primary producers, who were written off as being too tradition-bound and unwilling to innovate or to respond to incentives.

It was left to research to provide the solution to this deadlock. The secret lay in the simultaneous elimination of barriers to increased yields by the development of new varieties highly responsive to irrigation and fertilizers through "genetic engineering" and the provision of these varieties to farmers, together with the appropriate package of inputs and cultivation practices based on experiments in farmers' fields. This package gave, under the right conditions, the demonstrable and dramatic increase in production which had not been attainable with the earlier piecemeal approach of attempting to overcome successive barriers, each of which raised the yield ceiling only marginally. When backed by wholehearted (and in some cases daring) support from governments in the provision of seed and other inputs, and in price policies, it led to the phenomenon now widely known as the green revolution.

TABLE 4-3. – ESTIMATES OF THE SOCIAL RATES OF RETURN TO INVESTMENT IN AGRICULTURAL RESEARCH

Type of study	Social rate of return	
	A [1] Returns at end of year above a 10 percent discount rate	B [2] Returns distributed internally
	..... *Percent*	
1. Particular United States farm products		
Hybrid maize research, public and private, as of 1955 [3] and internalized over 1910-55	700	35–40
Hybrid sorghum research, public and private, as of 1967 [3]	360	
Poultry research, public, 1960 and internalized over 1915-60 [4]		
Feed efficiency	178	25
Total productivity	137	21
2. United States agriculture, 1949, 1954, and 1959		
Public and private agricultural research and extension adjusted for excess capacity [5]	300	
3. United States agriculture, 1938-63		
Public agricultural research and extension [6]		54–57
Adjusted for private research [6]		46–48
4. Agricultural research in Mexico		
Wheat research, 1943 to 1963 [7]	750	
Maize research, 1943 to 1963 [7]	300	
Total agricultural research in Mexico, 1943 to 1963 [7]	290	
5. Japanese agriculture, 1880-1938		
Predominantly investment in education, for example, in 1880, education 23.6 million yen, and agricultural research and extension 0.3 million yen; and in 1938, 185 and 21.5 million yen, respectively [8]	(35)	

SOURCE: Schultz, T.W., *The allocation of resources to research*. Chicago, Ill., University of Chicago, Agricultural Economics Paper No. 68:16. Revised, 1969.

[1] Estimate A is obtained by applying a 10 percent discount rate to the flow of cost incurred over time accumulated and, also, to the flow of benefits obtained over time accumulated. The 10 percent discount rate is assumed to be a reasonable proxy for the rate of return on alternative social and private investment. The use of estimate B, the internal rate of return, may attribute an inordinately high value to a dollar spent in the more distant past. For example, in the case of hybrid maize, the internal rate of return attributes a value of $2 300 to a dollar spent in 1910 in developing hybrid maize. – [2] Estimate B is that rate of return which equates the flow of costs and flow of returns over time: it thus distributes the net benefits equally over the entire period measured in terms of the internal rate of return. Estimates A and B are different ways of interpreting the same set of cost and benefit facts. – [3] Griliches, Zvi. Research costs and social returns: Hybrid corn and related innovations, *Journal of Political Economy*, 66: 419-431. 1958. – [4] Peterson, Willis, *Returns to poultry research in the United States*. Ph.D. dissertation, University of Chicago. 1966. – [5] Griliches, Zvi. Research expenditures, education and the aggregate agricultural production function. *American Economic Review*, 54: 967-968. 1964. – [6] Evenson, Robert E., *The contribution of agricultural research and extension to agricultural production*. Ph.D. dissertation. University of Chicago. 1968. – [7] Ardito-Barletta, Nicolas, Costs and social returns of agricultural research in Mexico. Ph.D. dissertation. University of Chicago. 1967. – [8] Tang, Anthony M., Research and education in Japanese agricultural development. 1880-1938. *Economic Studies Quarterly*. 13: 27-42, 91-100, 1963.

Whatever the weaknesses identified subsequently in terms of second generation effects, this has had an immediate impact of incalculable importance not merely in raising production and productivity in the critical food-deficit areas of Asia, but in disposing of two myths. The first of these was that research was either slow-yielding or low-yielding, or both; the second, that even if research produced potentially successful results the farmers growing food crops were too subsistence-minded or ignorant to utilize them. Calculations by Griliches had shown a rate of return of no less than 700 percent on United States hybrid maize research as of 1955, and of 360 percent on hybrid sorghum as of 1967, while Barletta had calculated a return of 750 percent on wheat research in Mexico between 1943 and 1963 (Table 4-3). These, however, had been largely discounted as evidence of what might be done in a predominantly peasant economy.

Although it is difficult to calculate a rate of return on the global effects of the spread of Mexican wheats or on the Asian rice development programme, because of the dual involvement of international and national research and plant-breeding programmes in each case, the incremental returns have to some extent been assessed. The cumulative value of the addition to wheat production in India between 1966 and 1969 is estimated by Anderson[12] to be U.S. $1 850 million (mainly attributed to high-yielding varieties and related inputs); while that of rice production increases for Asia (excluding China) over the same period is believed to be around $1 500 million.[13] In contrast, the capital and recurrent expenditures for the International Rice Research Institute (IRRI) in the Philippines, from its establishment in 1962 until 1970, were of the order of $20 million.

These developments represent an historic breakthrough in production of wheat and rice which, with some 20 million hectares now under high-yielding varieties in Asia and north Africa, are not confined only to the large holdings. Important lessons have been learnt and plant engineering techniques developed which can result in more rapid progress with other cereals and, it is hoped, food legumes, vegetables, and roots and tubers.

Nevertheless, the full potential even for wheat and rice in favourable areas is far from being realized. Average yields of most food crops remain depressingly low, increases in production barely keeping up with population growth outside south and south-east Asia, and the spread of the green revolution both geographically and to crops other than wheat and rice has not been as fast as the more optimistic forecasters had hoped. Hence the need for both protective and adaptive research, and for the research to increase diversification stressed by Moseman.[14]

[12] Anderson, R.G., 1970 wheat improvement and production in India. *Proceedings, FAO Wheat Breeding Seminar, Ankara, 1970.*

[13] Willett, J.W., The impact of new varieties of wheat and rice in Asia. *AID Spring Review, Washington,* D.C., May 1969.

Some lessons from the past

There are a number of reasons for this continuing lag. Comparisons between the progress of research in developed and developing countries show why a stronger research base is needed in the latter, how the more advanced countries might help to build this, and what needs special attention in such a joint effort.

A glance at the list of new developments will show that a significant number of them have depended — and continue to depend — on a sophisticated industrial base. It is quite inconceivable that in the 1950s many (if any) developing countries could have formulated, tested and mass-produced ammonium phosphate, anhydrous ammonia, 2-4D, DDT, Malathion, or any other of the agricultural chemicals or machines on which the agricultural revolution in developed countries has so largely depended.[15] The developing countries were, and in large measure remain, dependent not merely on imported technology, but on imported manufactured inputs or at least on imported raw materials to make that technology work. This has important implications for their balance of payments.[16]

To the extent that research requires increasingly sophisticated and expensive equipment, and produces a more complex or input-oriented technology, this dependence is likely to grow rather than diminish at least for several decades.

Another facet of the same problem is that a good deal of the new technology is not scale neutral. It works better or more economically on large rather than small farms, especially if the latter are fragmented as frequently they are. This applies particularly to mechanization, to some aspects of pest and disease control, and even to irrigation. Even those techniques which are relatively scale neutral in theory, such as use of fertilizers or herbicides, require cash or credit for their purchase, and since smallholders are poor credit risks and lack liquidity or security they find it more difficult to obtain inputs than their richer neighbours.[17]

[14] *Op. cit.*

[15] Elliott, C.S., has calculated that 50 to 60 percent of the recent increases in yields of wheat and barley in the United Kingdom came from a combination of fertilizers, herbicides, and mechanization, and most of the remainder from genetic improvement (*Journal of the National Institute of Agricultural Botany*, 9: 379, 1963).

[16] To keep this issue in perspective it has been calculated that if production in India did not rise as a result of imports of fertilizer worth Rs. 1 350 million the resulting deficit in foodgrains would require imports costing Rs. 4 500 million. On the other hand the establishment of a domestic fertilizer capacity to produce the same increase in crop output would cost only Rs. 600 million.

[17] Another source of inequality may be in the fact that better educated farmers are more prone to be early adopters. If the system of education is based on privilege, this further weights the scales against the poorer classes.

TABLE 4-4. – FARM AVERAGES AND HIGHEST PRODUCTIVITY IN CROP TRIALS AND DEMONSTRATIONS IN INDIA

	Average	Highest	Calories per kg	Vegetation period	Calories per ha × 10^6	Edible	Calories per ha per day × 10^4
	Quintals per hectare			*Days*		*Percent*	
CEREALS AND MILLETS							
Rice	16.0	100.00	3 520	120	35.20		2.93
Maize	11.3	110.00	3 630	90	39.93		4.43
Wheat	11.7	71.63	3 440	120	24.64		2.05
Sorghum	5.2	98.00	3 550	130	34.79		2.67
Bajra	3.8	67.10	3 270	130	21.94		1.68
TUBERS AND ROOTS							
Potato	80.0	411.00	840	120	34.52	95	2.62
Tapioca	130.0	480.00	1 530	300	73.44	85	2.44
Sweet potato	58.0	372.00	1 140	135	42.40	85	3.14
Yam	58.0	190.00	1 130	135	21.47	85	1.59

SOURCE: S.K. Sinha, IARI.

It is only quite recently that the magnitude of the rural employment problem has alerted planners and scientists to the fact that a technology is needed which is not merely effective in its impact on output or quality but which is also socially and politically acceptable. There is no easy or unique solution to this problem and it requires a greatly strengthened research effort of a multidisciplinary nature involving biological, mechanical, social and economic sciences.

There is also the danger of a widening income gap between areas of favourable environment, where the high-yielding package can be very profitable, and poorer areas where inadequate or excessive moisture, limiting temperatures, and soil or slope problems impede its economic use. The unexploited potential in favourable areas is still very high. Swaminathan has pointed to a theoretical maximum attainable yield of 140 tons of dry matter per hectare per year from a balanced rotation, whereas at present the maximum being obtained in multiple cropping experiments in monsoon Asia is 25 tons per hectare per year, which is extremely high by normal growing standards in any country. Table 4-4 shows the size of the gap between highest single crop yields in India, and normal averages for these crops. There is therefore a strong and understandable temptation for countries with food supply problems to concentrate on areas favourable to intensive agricultural techniques so as to develop this great potential.

However, a careful estimate[18] suggests that, at a maximum, such areas represent no more than 30 percent of the total arable area and they are under increasing population pressure. This apart, social justice requires that more attention be paid to raising productivity and incomes in rainfed, semiarid farming areas, mountainous lands, and in the difficult soils of parts of the humid tropics. These have had far too little attention in international support for research, there is no known package which can dramatically raise yield ceilings, and it is not surprising that there is great poverty in these areas and a high outflow of people to the cities.

One other important issue has recently come to the fore: the predominantly industrial-based production technology, on which *inter alia* the green revolution depends, presents pollution hazards arising both from the manufacturing processes of its inputs and from some of their end effects on soil, water, and living organisms. The main impact has so far been in the developed countries and has affected their agriculture via legislation against mercury, chlorinated hydrocarbons, certain herbicides and food preservatives, and in some cases against actual foodstuffs.

At current levels and growth rates of input use in the developing countries it will be a long time before serious pollution hazards can be predicted there. In this, if in little else, time is on their side, since it can be hoped that greater research efforts will be devoted as a matter of urgency in developed countries to solving a problem which they themselves largely created. However, there is no guarantee that research undertaken in developed countries, particularly by private industry, will produce appropriate solutions to such problems as they affect developing nations. A simple example is the substitution of certain phosphorus-based insecticides for

[18] FAO, *Provisional Indicative World Plan for Agricultural Development*, Vol. I, Chapters 2 and 3, Rome, 1970.

DDT. While these do not present the known long-term pollution hazards of DDT, some have extremely high and rapid mammalian toxicity and require protective clothing and other precautions for their safe use. These are beyond the means of small peasant farmers. There is thus a need for joint planning and action between industrial countries and predominantly rural developing countries to evolve a programme of research suited to the needs and capabilities of each, with well-defined objectives.

It is apparent that the dimensions of the problems facing research are changing; indeed, the conclusions of the report *Limits to growth*[19] challenge the whole concept of growth in a modern technocratic society although the issue was barely recognized a decade ago. A spotlight is also being focused on the so-called "second generation" problems of the green revolution; this has provided a happy hunting ground for research theses and publications, some of which appear to start with a built-in bias and then set out to prove it. The danger is that studies of this nature lead to articles such as a recent one in *The Times* entitled "Questioning Doctor Borlaug's 'miracles'," which practically accuses him of criminal negligence.[20]

To some extent this can be regarded as a predictable reaction to the initial popular euphoria about miracle seeds, and few scientists would now disagree that research, which in the past has been heavily oriented toward producing new technology, needs a broader base to tackle these new demands — and in particular should try to show foresight rather than hindsight. However, research needs to be objective both in its approaches and its conclusions, and it is pertinent to consider when looking at the social or environmental side effects of new agricultural technology what the food and nutrition situation would have been in a number of the world's most populous countries had there been no such technical progress.

Even so, many millions in developing countries are without adequate nourishment, shelter or employment, and it would be disastrous — as Borlaug himself has pointed out[21] — if vocal pressure groups in affluent societies were to divert resources from research designed to alleviate these problems. What is needed is not less but better balanced research with teamwork and understanding between technical, social and economic disciplines. The real need is not to dwell unduly on the errors of the past, but to draw on them in evolving a more appropriate pattern for the future.

[19] *Limits to growth...* by D.H. Meadows and others. New York. Universe Books. 1972.

[20] *The Times*. London. 9 May 1972. Review of a publication "How revolutionary is the green revolution." by Dr Ingrid Palmer.

[21] Borlaug. N.E.. *Mankind and civilization at another crossroad*. Rome. FAO. 1971, McDougall Memorial Lecture.

It has been argued that the stock of existing knowledge is so great and the gap between experimental and farm yields so vast that a moratorium could be placed on research and that all that is needed is improved extension and other services. This is as misleading as the contention that a major research achievement will sell itself without the need for supporting infrastructure. There have been numerous failures of attempts to transfer technology (particularly mechanization) to new environments, the lesson of which, as Wortman[22] has emphasized, is that while scientific principles and methods are broadly transferable, the resultant technology generally requires a substantial (and often multidisciplinary) adaptive research effort to make it acceptable and profitable to farmers in a different set of conditions.

While it is true that extension efforts have often failed because the imported technology they were offering did not work or was uneconomic, there are also examples of indigenous and apparently well-adapted agricultural research results which failed to take off. Sometimes this was because their timing was out of phase with national needs, or because some critical incentive factor was missing (even something as apparently insignificant as grain colour or texture); more often it was because of weaknesses or inflexibility in the supporting services required to make the new knowledge freely available to the farmer. An example is the high-yielding maize programme in Mexico where special programmes, going far beyond conventional extension measures, have had to be established to achieve the widespread acceptance of new techniques by small farmers even though they were theoretically highly profitable.

It is now increasingly recognized that technical progress depends on a chain by which new knowledge passes from research centres to the farmers through conventional extension services, special programmes or other appropriate means, and which is as effective as its weakest link. Success depends on striking the optimum balance between the search for basic understanding, the adaptation of existing knowledge, and the provision of effective supporting scientific and technical personnel adequately trained and educated for the role it has to play. Some rules of thumb have been suggested,[23] but conditions, resources, and levels of development vary so widely between countries in the developing world that pragmatism is essential and most judgements can best be made in the light of local conditions.

It is asking a tremendous lot of newly emerging

[22] Wortman, S.. The technological basis for intensified agriculture. in *Agricultural development: Proceedings of a conference sponsored by the Rockefeller Foundation. April 1969*. p. 17-43. New York. Rockefeller Foundation. 1969.

[23] For example. the United Nations Advisory Committee on Science and Technology (ACAST) has proposed a ratio of 1:4 on expenditure between basic and applied research. and of 1:2 between R and D and STS (including extension).

nations to expect them to adapt existing knowledge to meet their urgent needs, and also to undertake basic research aimed at a technology more appropriate to their long-term needs and resources. This is only likely to be feasible through a joint effort by developed and developing countries, and it is pertinent to consider the magnitude of the resources likely to become available as a result of such an effort, since these will largely set the boundaries of what can be done.

The resource base for agricultural research

In many developing countries, research has until recently depended heavily on expatriate skills and foreign financial support; and decolonization, followed by a rapid rundown of career colonial services, left large gaps both in research and extension services. There is still considerable reliance on external assistance, but with the exception of certain research projects of international agencies and private foundations which have contributed heavily to the technical revolution in wheat, maize and rice production, it has proved difficult to ensure continuity of support or coordination between different agency programmes — or to evaluate their impact. Coordination is improving, but a serious lack of information exists as to the total money and manpower being devoted to research in and on behalf of developing countries. This is an impediment to sound planning of future activities.

Although surveys have been undertaken recently on research establishments by Unesco in Africa, by the Inter-American Development Bank (IDB) in Latin America, and by FAO in the Near East, these lack a uniform methodology; the main point of consistency being that none of them has any financial data nor an overall view of manpower availabilities in relation to requirements for the region studied. Earlier (mid-1960) data for 24 African, 9 Asian and 9 Latin American countries (including most of the larger ones) show a total outlay of about U.S. $80 million on agricultural research. Of the African countries, only 6 were spending over $2 million on agricultural research (mainly on crops) in 1966/67, and only 8 had more than 50 professional research staff.[24] In Asia 6 out of 9 countries studied were spending under $1 million in 1960, and in Latin America (1962) the proportion was roughly the same although the numbers of trained staff were rather higher than in Africa, and with a much lower expatriate element. This implies that few countries could then support more than one well-equipped centre, and that substantial increases in expenditure on research and also on education and training of research and extension staff are required to meet future needs.

Although the later surveys suggest that some improvement has taken place in the availability of trained manpower, they also show that many problems remain in most developing countries in terms of technical and managerial skills for research, in organization and lack of coordination, and that the brain drain is still a serious constraint on national research because of the poor status, salaries and support given to research workers, particularly in the agricultural sector, or because their talents are improperly utilized due to poor manpower planning. The 1964 target[25] of 200 scientific workers and university science teachers per million inhabitants seems unattainable both in terms of costs and of trained manpower, and it is manifest that by comparison with developed countries the developing countries are not investing enough of their own resources in research and related education and training to give them the scientific independence they desire. Evenson has estimated that in the mid-1960s only 11 percent of the world's investment in agricultural research was in the low-income countries of Africa, Asia and Latin America.

Information on agricultural research expenditures by developed countries in or on behalf of the developing countries is also hard to obtain, but perhaps $60 million were being spent bilaterally in 1970 (including that by private foundations and universities), and another $20 million under international programmes. This would give a total expenditure of around $220 million in 1970, assuming $140 million from the developing countries themselves, and another $80 million in external aid flows.

The United Nations Advisory Committee on Science and Technology (ACAST), in its World Plan of Action for Science and Technology in the Second Development Decade, proposed planning targets for financial support to specific objectives. It suggested that the developed countries should devote 5 percent of their total research and experimental development (R and D) expenditure to assisting research in the developing countries during the decade, and that the latter should raise their own contribution from an average of 0.2 percent of GNP in 1970 to 0.5 percent by 1980.[26]

[24] See also Table 4-6. Source: Evenson, R., Economic factors in research and extension investment policy. *Proceedings of the Conference on Agricultural Research and Production in Africa, Addis Ababa, 1971.* There is no special magic in figures relating research or extension workers to numbers of farm families since these need to be assessed in the light of local circumstances, and may be outdated by new concepts, particularly in respect of extension (see Chapter 3). Nevertheless, the enormous disparities revealed by these calculations show the general magnitudes of the task faced by developing countries.

[25] Unesco/ECA (Economic Commission for Africa) Conference on Research and Training in Africa, held in Lagos in 1964.

[26] A roughly similar target (or alternatively 6 percent of their total investment budget) was suggested by the Unesco/ECA Conference in 1964.

TABLE 4-5. – TARGETED EXPENDITURE FOR RESEARCH AND EXPERIMENTAL DEVELOPMENT (R AND D) IN AGRICULTURE IN THE SECOND DEVELOPMENT DECADE

	1970	1975	1980	Second Development Decade
Total GDP ($ thousand million)	295	375	525	3 925
Agriculture as percentage of GDP	33	30	26	29
Agricultural GDP ($ thousand million)	97	112	136	1 142
R and D as percentage of agricultural GDP	0.2	0.3	0.5	0.34
R and D ($ million)	**[1]220**	**340**	**680**	**3 900**
Public budget for agriculture as percentage of GDP	1.1	1.2	1.3	1.2
R and D as percentage of public budget for agriculture	6	7	10	8

[1] Including external aid contributions to public sector expenditure.

No sectorial breakdown was suggested, so calculations of what this might mean for agriculture were made by FAO on the basis of the ACAST and Pearson Commission aid targets, using its knowledge of existing R and D expenditures (assuming that the bulk of research support in developing countries comes from the public sector budget), and Second Development Decade growth targets for agricultural GDP in the developing countries. The results are shown in Table 4-5.

It is difficult to check the consistency of this model for lack of comprehensive data. However, studies of national plans for some major developing countries indicate that around 6 to 10 percent of the agricultural public budget was allocated to R and D in 1965. It could very well be argued that the remaining countries were some of the least developed and their inclusion would bias the overall average downward to around the 6 percent figure used as the base year assumption in Table 4-5. The annual growth rate in expenditure of about 12 percent compound resulting from the proposals in the table would seem to be in line both with those suggested by the ACAST consultants, and with those quoted for Latin America in the Pearson report.

While the target of 0.5 percent of GNP may seem unambitious it nevertheless represents a formidable rate of growth, not only in financial disbursements but in building up national absorptive capacities to use so rapid an increase in expenditure effectively. Indeed, lack of skilled research managers as well as research workers may well be a reason — and a valid one — for the apparent inadequacy of financial

TABLE 4-6. – AGRICULTURAL RESEARCH AND EXTENSION INVESTMENT IN SELECTED COUNTRIES AND REGIONS

	Estimated expenditures per year		Share of GDP originating in agriculture spent on		Number of farms per	
	Research	Extension	Research	Extension	Senior researcher	Extension worker
	Million U.S. dollars (1966)		..... *Percent*			
United States	388	178	2.17	0.99	346	555
Canada	60	26	1.62	1.05	321	167
Australia	51	(24)	2.98		126	...
New Zealand	6	5			159	160
Western Europe	200	130	0.88	0.62	1 605	822
Eastern Europe and U.S.S.R.	200	(130)				
Mexico	2	0.3			4 550	6 320
Central America and Caribbean	4	3	0.11	0.52	4 270	3 407
South America	(24)	(18)	0.16	0.08	3 846	2 538
Africa[1]	47	(52)	0.49			
West Africa	10.3	(10)	0.11			
East Africa	17	(20.1)	1.20	1.80	19 143	801
Central Africa	1.7	(2)			6 179	
North Africa	18	(20)	0.68		6 050	
South Africa and Rhodesia	(7)	(5)				
Japan	62	36	1.24	0.72	1 131	433
Israel	6	4	2.67			
Asian developing countries	42	(60)	0.10		16 700	1 038

SOURCE: Evenson, R., *op. cit.*

[1] Excluding South Africa and Rhodesia.

support by developing countries to building up their own research programmes (Table 4-6).

To what extent aid in various forms is likely to fill any gaps left by the efforts of the developing countries themselves is difficult to answer. It must be stated frankly that, even taking an optimistic view of new international support for agricultural research following the formation in 1971 of the Consultative Group on International Agricultural Research,[27] total resources are likely to fall well short of needs. The Consultative Group has set no precise targets for expenditure, and is an informal association of mainly donor agencies rather than a consortium, but it seems unrealistic to think in terms exceeding $35 million by 1975, roughly half of which would represent existing commitments of members in 1971 to, for example, the International Centre for Maize and Wheat Improvement in Mexico (CIMMYT), the International Rice Research Institute (IRRI) in the Philippines, and the new International Institutes for Tropical Agriculture in Colombia and Nigeria.

The targets of the Pearson Commission for the contribution of developed countries to R and D by 1975 would imply a total availability of around $600 million. Assuming an allocation to agricultural research approaching the contribution of the agricultural sector to GNP (say 25 percent), for which there is a strong case in view of its role in providing income and employment for nearly 70 percent of the population in developing countries, a figure of $150 million would be arrived at. Thus, even if the Consultative Group were providing $20 million of *new* money by that date, other aid would also have to increase by $50 million over the 1970 level to raise total aid flows to agricultural research from $80 million to $150 million.

However, while funds provided by members of the Consultative Group will be used to support internationally agreed priorities in a coordinated fashion, they will be channelled direct from donors to the institute or programme concerned. While some individual projects will continue to be funded bilaterally and others through international agencies, the growth of support through these more traditional channels may well be slowed down as a result of the establishment of the Consultative Group. Moreover, the United Nations system is experiencing severe financial problems which do not presage well for a rapid growth in its activities, whether in research or in other fields.

All these factors suggest a considerable shortfall in support for R and D in the developing world, both domestically and from external aid, throughout the Second Development Decade. While it might be argued that the targets proposed, which would imply external aid of around $300 million by 1980, are wildly optimistic, in fact they do not seem inconsistent with what would be necessary to achieve a strong network of international and national institutes to meet the calculated requirements for food and export crops. Moreover, the volume of requests to the Consultative Group for international support alone suggests that a 1975 aid figure of $150 million might be in line with demand even if overoptimistic in terms of likely financial flows. Naturally not all of these requests are of equal merit or urgency, and there is danger that if a principle of "first come first served" were to be applied some problems of secondary importance might receive support ahead of others deserving priority.

There is therefore an urgent need for an international framework for setting priorities and for a sharp focus within those priorities on well-defined problems on which efforts can be concentrated. The IDB report on Latin America states: "Many Latin American researchers, even though they accept the criteria imposed by necessity, claim the right to freedom of thought and believe scientific 'inspiration' should go unimpeded, as a means of resisting the trend among directors to orient research to development problems and therefore to set priorities and allocate funds in accordance with those priorities." The report goes on to state that despite the efforts and contrary to the opinions of many directors sufficient emphasis is not given to the concept of concentrating on priority needs.

Reference was made earlier to the outcry among scientists in the United Kingdom over the recommendations of the Rothschild report; this and the reaction to the introduction of the Planning-Programming-Budgeting System (PPBS) in the United States Department of Agriculture, which some scientists saw as an issue of scientific integrity versus political expediency and some planners as one of research for the public benefit against research for the benefit of scientists, show that such problems are not confined to the developing countries. This highlights the need for close rapport and liaison between planners and research directors — a major weakness in most countries, whether developed or developing.

Determining priorities

Guidelines for agricultural development in the present decade indicate that growth in the sector will have to average 4 percent in the developing countries compared with the 2.7 percent achieved during the First Development Decade; that food production

[27] The co-sponsors of this Group are FAO, IBRD, and UNDP. Its membership consists of 12 "donor" countries, countries elected to represent the developing regions, the regional development banks, the Ford, Kellogg and Rockefeller Foundations, and the Canadian International Development Research Centre. The secretariat of the Consultative Group is based in Washington, D.C. The Group is supported by a Technical Advisory Committee (TAC) of 13 scientists, the secretariat of which is supplied by FAO.

will have to increase by 2.7 percent per year merely to keep pace with population growth, and by 3.9 percent per year to meet economic demand for food, with a further effort to improve the quality of the diet; and that export earnings will have to rise from 2.5 to 3.4 percent per year to permit the overall economic growth targets to be achieved. A reinforced overall research effort will be required to extend and adapt current improvements in agricultural technology over a wider area, to develop new high-yielding varieties, and to raise quality of food and export crops and of livestock. Increasing attention will also have to be given to social and economic problems, including the interrelations between new technology, employment and income distribution within the context of the development of the rural sector and the multiple goals of better living for rural people; however, this should not so much imply a shift in priorities from technical to socioeconomic research, but rather a stronger research effort aligned to the rural sector as a whole.

While these broad guidelines and objectives are valuable they include more subjects requiring research than there are resources available and more specific criteria and detailed information are necessary to facilitate the definition of research priorities. At the national level development plans should give sharper focus to such priorities, but no such precise guidelines are available for determining the imperatives for global or regional research. Nor have mathematical models yet been developed which are of great value in this respect, although the symposium on resource allocation in agricultural research[28] held in Minnesota in 1969 indicates that some progress may be expected in the foreseeable future. However, it is likely to depend on rather sophisticated models requiring a sound information base and detailed knowledge both of existing research programmes and budgets as well as of national plans and resources: to aggregate such data meaningfully so as to identify global (or even regional) priorities is likely to be an even more complex task. In this context it was reported at the symposium that the United States Department of Agriculture study "A national program of research for agriculture," which attempts to define socially desirable levels of publicly-funded agricultural research in 1972 and 1977 in each of 91 research problem areas (which led to the establishment of PPBS), had been criticized as being too broad and general to be meaningful in appraising social benefits. Clearly, priority setting in research, where the elements of risk and uncertainty are high, is one of the most difficult tasks facing both planners and scientists.

[28] *Resource allocation in agricultural research: Proceedings of a Symposium held at the Agricultural Experiment Station and Department of Agricultural Economics. University of Minnesota. 1969.*

TABLE 4-7. – UNITED STATES: ALLOCATION OF RESEARCH FUNDS, STATE AGRICULTURAL EXPERIMENT STATIONS, 1951-54 AND 1961-64

Research area	Average relative support		
	1951-54	1961-64	Change 1951-54 to 1961-64
	..... *Percent*		
Plant science	37.6	35.8	— 1.8
Field crops	13.7	12.0	— 1.7
Horticultural crops	9.8	9.2	— 0.6
Forestry	1.0	1.6	+ 0.6
Soils and plant nutrition	7.7	7.3	— 0.4
Botany and plant pathology	5.4	5.7	+ 0.3
Animal science	28.8	29.2	+ 0.4
Livestock and poultry	23.4	23.1	— 0.3
Entomology and zoology	5.4	6.1	+ 0.7
Other areas	19.0	21.6	+ 2.6
Agricultural economy and rural life	3.7	3.3	— 0.4
Marketing	4.2	6.6	+ 2.4
Utilization	3.0	3.9	+ 0.9
Agricultural engineering	3.5	4.0	+ 0.5
Home economics and human nutrition	3.6	2.4	— 1.2
Genetics	1.0	1.4	+ 0.4
Research not classified elsewhere	3.6	3.0	— 0.6
Administration and capital outlay	11.2	10.5	— 0.7
	.... *Million U.S. dollars*		
Total funds	72.1	167.8	

SOURCE: Symposium paper by R.R. Robinson. *Research allocation decision-making in the Land-Grant universities and agricultural experiment stations.*

A valuable tool in reducing the magnitudes of this task would be the availability of more precise information on current research programmes, their objectives, and the resources being devoted to them. This would help to identify gaps and weaknesses as well as indicating where shifts in emphasis might be needed to meet changing requirements. There is a built-in resistance to change in research as in many other activities (see Table 4-7) but in planning resource allocations it is not enough to know just the additive needs of research programmes — where the whole effort is being directed must also be clear.

It is worth noting that the first outcome of the study mentioned above was the initiation of the Current Research Information System (CRIS) which provides the machinery for information storage and retrieval procedures to facilitate reporting and evaluation of research. FAO has begun, with the help of members of the Consultative Group, the pilot phase of a project, the Computerized Agricultural Research Information System (CARIS), with broadly similar objectives, aimed at producing an index of the current research situation in the developing countries.

While such systems can do much to identify areas where reinforcement is needed (and vice versa), thus saving time in launching missions to evaluate current research activities, the existence of a gap or a need does not in itself constitute a priority for research. For setting priorities, and for determining the best approaches to research within those priorities, more specific criteria are required.

These should involve consideration of the countries, commodities, or sets of conditions which require research most urgently; the fields of activity or disciplines on which research ought to be concentrated; the type of research likely to be most valuable in terms of its social and economic benefits; the costs and probability of success of a specific programme; the requirements for its successful implementation; and the further implications for agricultural policy if its success is widespread.

There is no general consensus as to criteria; in fact, those applied to determining international research priorities will differ in some respects from national requirements and at the national level a country's resource endowment, such as petroleum or other minerals, might lead it to priorities very different from those of its neighbours in the same geographical area or with similar agro-ecological conditions. Certain broad guidelines can, however, be suggested which must be interpreted in the light of national planning objectives. These are the following:

Importance of the agricultural sector to the national economy in terms of its share of total population, employment, and contribution to gross domestic product.

Pressure of population on usable land and, particularly, on food supply. Most requests for research support received by the Technical Advisory Committee still relate to food crops and livestock. The FAO Regional Conferences and the Committee on Agriculture have emphasized that food production — including improvement of quality in the diet — is still of high priority.

Probable distribution of the benefits from research. This requires a view of the type of technology likely to result from the programme. Can it be adopted by the smaller farmers, will it benefit areas with a less favourable environment, will it increase employment in farming and in related industries, will it cause or reduce pollution, will it demand even more use of inputs? (Some of these desiderata may be very difficult to reconcile.) In the case of food production will the product be available only to those in higher income groups (e.g., beef), or could it reach the broad mass of the people (e.g., higher protein varieties of cereals or food legumes)?

Impact on and importance of foreign exchange earnings or savings. The most obvious question here is the priority to be given to all aspects of research on specific export-earning crops or forest products, which may be critical for some countries and unimportant for others. However, there may be cases where a project would be supported because it might contribute not only to domestic needs but also to export earnings — beef again or perhaps vegetables or fish culture — or rejected because it implied an unacceptable foreign exchange component for the successful implementation of its results.

The time horizon, both in relation to the research programme itself and to its objectives, that is, the balance between immediacy and longer term needs. While it may be difficult to avoid responding to national emergency situations, an impartial view might place greater weight on research designed to safeguard resources needed for future development and to illuminate planning choices; for example, the collection, evaluation and conservation of genetic resources, or pilot research to identify optimum approaches to opening up undeveloped areas, rather than concentrating all research on those already settled.

The actual situation. Is more research really essential or are existing resources adequate to cope, possibly with improved coordination and strengthening? Is the problem really one for research or is it more one of better application of existing technology, given appropriate institutional support? This is a question which has repeatedly come before the Consultative Group, which has had to send several missions to assess the true position. Improved information would greatly alleviate this task.

Resources available for research. At the national level in many developing countries trained staff may be limited and priority may have to be given to redeployment and training before a new research project can be initiated. However, the possible availability of resources needs to be looked at in its totality and the opportunities for attracting external support, either technical or financial, for a proposed research programme may be an important determining factor as to its priority. Such support might be in cash or kind, certain elements of a programme might be undertaken elsewhere (for example, by a developed country having sophisticated equipment) in support of the overall objective. All research on behalf of developing countries does not have to be undertaken in those countries. This is an important concept of the French system of support to overseas research, and other developed countries are showing an increased interest in forging symbiotic research linkages with international and regional programmes located in developing countries, or in some cases bilaterally with those countries.

Given the immediate urgency of many research problems and the paucity of resources, this is to be welcomed as long as it does not perpetuate technical dependence. *At the international level* it is being increasingly considered essential to give strong support to building up national research capacities to enable the results of the programmes of international institutes to be adapted to local ecological and socioeconomic conditions. The international centres can provide basic principles, new ideas and applications, improved genetic material and related agronomic practices, but this technology, even though it originates in an environment close to that of many developing countries, can rarely be transferred successfully *in toto*. Thus an important component of the budgets of international centres is for training (both centrally and in-service), information (including seminars and workshops), and for extending programmes to countries where the main potential for the use of their technology lies. This has to be taken into account in assessing their financial needs — for example, 25 to 30 percent of the annual recurrent expenses of CIMMYT and IRRI are devoted to such activities.

Probability of a successful outcome from research. This is an obvious criterion to state, but a difficult one to apply. To start, it is indispensable to obtain expert scientific judgement, and this may not be easy in relation to a highly specialized or a new field of research. Second, it may be that there is a higher scientific probability of success from one proposal than from another, but that the rewards would be much greater from the latter. Third, cost elements as well as potential benefits have to be assessed. Attempts are being made to establish systems which allow projects to be compared on a cost-effectiveness basis. Table 4-8 shows an example from a computerized system involving values derived from probability distributions of present value and internal rate of return cost-benefit analyses, and appears to be more applicable to comparisons of specific projects rather than to a research portfolio. Another attempt, based on a combination of value judgements as to the contribution of competing alternatives to economic and other goals, and cost calculations, is being applied in Iowa, United States, to the state's entire experiment programme by review panels of research scientists, each covering a research topic or problem area. A rather similar approach has been proposed by Robinson,[29] which can be applied to a single project or to a portfolio. This, however, depends heavily on judgement as to the weighting factor, but as Robinson has pointed out even a good mathematical formula can be grossly misleading if it is based on unreliable data.

Probability of successful implementation of research results. This depends partly on the political will to support the programme and partly on the availability of adequate infrastructure and services to spread the adoption of its results. The assurance of political support requires that a close dialogue be maintained between planners and scientists to ensure compatability with national priorities, and the ability of the latter to explain their ideas and objectives in an understandable way to those responsible for political decisions. Assuming that the criterion outlined above regarding the probable distribution of benefits has been adequately met, a number of the answers should already have been formulated; however, specific action on price policies or other incentives, supply of inputs, provision of extension and other supporting services may still be essential to the successful outcome of national research endeavours.

It will thus be seen that while there are a number of criteria which help, the assessment of priorities for the application of science to the generation of new knowledge is still a fairly unscientific business. No doubt cumulative experience from the work being done on developing and improving methodology for resource allocation to research will lead to a more reliable and systematic approach. How-

[29] *Op. cit.*

TABLE 4-8. – EXAMPLE OF INFORMATION PROVIDED BY PROPOSED MARRAIS[1] COST-EFFECTIVENESS ESTIMATION MODEL

Average annual expenditure	Research project A				Research project B			
	Planning period	Estimated benefit/ cost ratio	Standard deviation estimated benefit/ cost ratio	Technical feasibility predictability index	Planning period	Estimated benefit/ cost ratio	Standard deviation estimated benefit/ cost ratio	Technical feasibility predictability index
U.S. dollars	*Years*			*Percent*	*Years*			*Percent*
5 000	10	7.5	8.1	65	15	6.4	6.8	85
15 000	5	7.0	2.5	62	7	7.8	4.3	72
25 000	3	5.3	1.2	55	5	5.4	2.2	71

[1] Minnesota Agricultural Research Resource Allocation Information System.

ever, there are difficult problems in accounting for the risk element, particularly with inspired but apparently speculative biological research, such as trying to transfer the symbiotic nitrogen-fixation principle to other plant families besides the leguminosae and certain nonleguminous angiosperms, for example, the genus *Alnus*. Such research is beginning to get serious consideration from industry, but it might be extremely difficult to mobilize public sector support for it and in this context it is interesting to speculate on what national or even international support would have been given ten years ago to a man who said: "I will produce within a decade a crop variety with a short growing season, which can be planted at any time of the year, which will stand up to 120 kilogrammes of nitrogen per hectare, which will yield 8 tons of grain per hectare at each harvest, and which will alleviate famine in Asia." This is the sort of knotty problem for which TAC has yet to have a test case.

Another much debated subject is how to assess the social costs and side effects of research.[30] It has been suggested that an attempt should be made to anticipate these costs when planning research and build them into the system which markets the products of the new technology: which is the same as saying that title to and responsibility for abandoned automobiles should revert to the manufacturer! This might be exemplary to irresponsible technical innovation in the private sector, but it could not be applied to much of public sector research directed to food production in developing countries, except as a criterion for *not* following a given research project through.

It therefore seems that the probability of success will continue to require a strong element of faith, and that a combination of mathematics, perspiration, and inspiration — seasoned with experience — will form the basis of judgement as to priorities for some years to come, as well as for the clear definition of specific problems related to those priorities in a way which makes them amenable to research. An analysis of reasons for disapproving research grant applications in the United States shows that the two main causes of rejection were poor problem definition and inadequacies in design and research procedures.

Intelligent interpretation of technical, economic and nutritional parameters can offer useful guidelines as to priorities, particularly in respect of the weighting which ought to be given to different fields of research, and the future growth potential as well as the present importance of agricultural products. It is important, however, not to be beguiled by possibilities of rapid short-term gains at the expense of more basic social, economic, or environmental goals, particularly if the former result in individual profit maximization by a relatively few individuals. This casts doubts on criteria such as "working on the most profitable crops" or on "problems likely to give a rapid return on investment" unless these can be equated with essential national or international goals. Even then there may be conflicts between countries and between regions in the identification of priorities.

[30] As Heady pointed out at the Minnesota symposium, these may be far removed from the sector in which an innovation has been introduced: for example, riots in cities as a result of reckless labour displacement on farms.

Priorities and problem areas

Classification of problem areas

No generally accepted system of classification exists for agricultural research problems related to the needs of developing countries. The United States Department of Agriculture system, defined in the study mentioned earlier, has been classified in CRIS in a three-dimensional fashion by *activity*; by *commodity*, *resource*, or *technology not commodity-oriented;* and by *field of science*.[31] The problem areas (understandably, since United States requirements for agriculture are different from those of most developing countries) are not directly applicable, as FAO has found out in trying to use the Smithsonian indexing system for the CARIS project.[32] However, the CRIS system of classification might well be useful as a basis for a more rigorous approach to research problem definition and priority setting for those countries.

The field is so wide (especially when forestry and fisheries are included) that it is unlikely that any watertight classification is feasible. What is needed is not so much a perfectionist approach as a means of identifying and defining research problems of developing countries within a logical framework, which can be linked for information purposes with those of developed countries in a global network. FAO has this objective very much in mind in designing CARIS, and is doing this in close consultation with experts from countries operating such systems.

Pending the outcome of these discussions, and for the purposes of this paper, a simple grouping of fields of activity has been attempted within which a few outstanding research problems will be discussed. It is obviously impossible to define and discuss all

[31] *Manual of classification of agricultural and forestry research: classifications used in Current Research Information System*. Washington, D.C., U.S. Department of Agriculture, Science and Education Staff. 1970.

[32] For example: *Fish and other marine life, fur-bearing animals and other wildlife* are grouped as problem area 904 under goal 9 – "Promote community development - beauty, recreation, environment, etc." in the CRIS classification. This is quite inadequate for global use.

such problems in a limited space. These areas of activity are the following:

1. Wise management of natural resources to improve the quality of the environment.
2. Raising yields of basic food crops and livestock and improving their nutritive value (including the postharvest problems of storage losses, drying, processing).
3. Development of improved agricultural systems, especially in difficult environments.
4. Research on agricultural raw materials, and improving their competitivity.
5. Socioeconomic research to improve agricultural performance and guide the aims of technological research.
6. Linking research and development.
7. Research support activities (gene banks, information systems, training, etc.).

1. Wise management of natural resources to improve the quality of the environment

Although the environment has acquired new meaning in recent years as a result of increasing pollution and the demands being placed on finite natural resources by rapid population growth, a better understanding of the relationships between plants and animals and their natural environment has always been fundamental to agricultural advancement. The reincarnation of Malthus' theory in a slightly different form does not alter this, but it highlights the urgency for empirical knowledge of environmental relationships.

However, the field open to environment-oriented research is very broad, and there is clearly a need for a better assessment of what is actually going on as a basis for further planning. The present needs of developed and developing countries are in many respects different: a theoretical international division of responsibility might allocate the problems of basic research related to countering the pollution effects of agricultural and industrial technology (including food pollution) to advanced countries which are still the main technical innovators, and problems of better natural resource utilization to developing countries, because natural resources largely set the limits to the agricultural growth on which they so greatly depend. Indeed, in a recent paper Levine[33] has argued that since the physical environment generally plays the dominant role among environmental factors it must be understood before other problems can be solved. Although this premise is debatable, Levine is right in pointing out that knowledge of sequential effects of moisture stress periods on crop growth is very limited; and that much expenditure on irrigation is wasted as a result of imperfect understanding of resource availabilities, physical relationships and human responses to a changed physical environment and the challenges it presents.

Robertson[34] has also emphasized that human understanding is a desirable attribute of the planner and has stressed that while the need for improved knowledge of human reactions is crucial to predicting the rate and magnitude of returns from the development of physical resources, it is probably the area of planning in which the margin of error is greatest and there are the least rules to work to. Thus, both biophysical and socioeconomic research are essentials for progress.

International agencies and also private consultants have done much in resource surveys to promote a better understanding of soil and water resources both at the global[35] and project levels, as well as in support of research on reclamation of the large areas which have lost productivity because of salinity, water-logging, or severe erosion resulting from improper soil and water management, or lack of conservation measures.

While research on improving knowledge of resource survey and management is likely to remain an important priority, to which remote sensing has given a new dimension, it is increasingly being argued that more attention should be given to improving farm water use and management. This must include research on biophysical relationships, improvement of soil fertility, determination of when and how much water to apply, design of equipment and systems which can allow small farmers to use water effectively, and on human and management problems, neglect of which may wreck even the best laid plans. The main difficulty lies not so much in deciding what research is required, but how best to set about doing it: whether at one international centre for water use and management, whether through some kind of network of linked projects presenting different problems in one or several countries of a region,[36] or perhaps through study of experiences in existing projects by a "travelling seminar." This is under urgent scrutiny at the moment.

[33] Levine, G., *Matching agricultural research priorities with development needs*. Conference on Strategy for Agricultural Development in the 1970s, Stanford, Calif., Stanford University, 1971.

[34] Robertson, V.C., Land and water resource planning in developing countries. *Outlook on Agriculture*. 6 (4). 1970.

[35] For example, the FAO Soil Data Bank and Soil Map of the World.

[36] FAO has submitted a proposal to UNDP for a research network in six cooperating countries of the Near East to work on an agreed research programme related to soil and water management problems.

2. Raising yields of basic food crops and livestock, and improving their nutritive value

This is a very wide field, and a number of subclasses could be proposed, including postharvest losses, processing and other stages of marketing. Both in crop production and in animal health important advances have been made by research in and on behalf of developing countries during the last decade, but it has become increasingly obvious that a multidisciplinary effort is needed to resolve some of the more intractable problems, which may be regional, and that such effort is often expensive and beyond the resources of individual national programmes. Recognizing the fundamental importance of adequate diet to human development and social progress TAC has given it top priority in its initial study of research needs of developing countries.

The Consultative Group has acted promptly to reinforce the four existing international centres working on problems of food production[37], as well as to support new initiatives to fill some major gaps. These include the establishment of a new international institute in India to work on crops of the semiarid tropics (sorghum, millet, food legumes); an immunological laboratory for killer livestock diseases in east Africa (East Coast fever and trypanosomiasis); and an institute for raising the protein content and tropical adaptability of the potato in Peru.

Proposals are being studied for strengthening research on food legumes; on animal production and health in Africa; collection, conservation and utilization of genetic resources for plant breeding; the potential for aquaculture; vegetables and upland crops in southeast Asia; pasture and livestock development in South America; the priorities of the Near East, and so on. Some of this research should improve understanding of basic processes; some should lead directly to improvements in yield and quality of key commodities; some should illuminate important planning choices or provide essential information on which to base further research.

Efforts are being reinforced by strengthened regional or international programmes in respect of the yield and quality of all major cereals except barley;[38] one new "man-made" cereal — triticale — developed by selection from wheat-rye crosses, with a very high protein efficiency ratio equivalent to milk protein, is on the verge of release.

Research on five of the principal high-protein legumes is, or shortly will be, receiving similar reinforcement. There are still gaps in species coverage; and some basic technical problems to be tackled in respect of balancing amino acids, apparently low inherent yielding capacity, disease, microbiology, toxic factors, and so on. A key question concerning food legumes is whether a central institute or a regionally decentralized approach would yield the best results, since although there are a number of common problems which would benefit from a centralized multidisciplinary approach the main species tend to have a rather strong ecological specificity.

Particular attention is being paid to improving the protein content and quality of the staple cereals and food legumes, since this offers the surest way of improving the diets of poor people with lower purchasing power and is a main plank of the United Nations strategy to avert a protein crisis in developing countries.[39] With current experimental yield levels of cereals such as wheat and rice so much in excess of those on the average farm there is a strong argument for shifting research emphasis to improving nutritional quality, and induced mutations are showing some promise here. The identification of genes controlling the amino acid balance of plant proteins in maize and barley has given an important impetus to the search for such linkages in other cereals. A research effort of comparable magnitude is required to raise the yield ceiling of the food legumes, which are at an increasing economic disadvantage in many areas compared with cereal varieties which have a higher yield potential, shorter growing season, and often guaranteed prices as well. India has been paying particular attention to this problem and has proposed a nine-point research strategy to improve their productivity and to reduce losses before and after harvest.[40]

More attention is also being directed to improving the yield, keeping quality and nutritive value of the tropical roots and tubers (cassava, yams, cocoyams and sweet potatoes) for both human and animal nutrition. These have long been neglected because of their low interest to developed countries, while their method of propagation has caused difficulties in the transfer of material for breeding purposes between countries. New advances in tissue culture and the possibility of developing true seed of certain species offer wider opportunities for their genetic improvement.

Perhaps the main weaknesses remaining in the food crop sector concern the annual oilseeds, particularly for rainfed areas (some, such as sesame, have a high food value, while developing a lower oil, higher protein groundnut is an attractive objective),

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[37] CIMMYT (wheat and maize). Mexico; IRRI (rice). Philippines; and the Centro Internacional de Agricultura Tropical. Colombia. and the International Institute of Tropical Agriculture (IITA). Nigeria. concerned with research into a wider range of commodities (including rice. maize. tropical roots and pulses), and improved farming systems in the humid tropics.

[38] Of particular importance in the Mediterranean and Near East areas. but also in south Asia and parts of other continents: area in developing countries totals nearly 20 million hectares.

[39] *Action to avert the protein crisis: report of the Panel of Experts on the protein problem confronting developing countries.* New York. United Nations. 1971.

[40] See *New vistas in pulse production.* New Delhi. Indian Agricultural Research Institute. 1971.

tropical vegetables and, particularly, the wide range of nutritious tropical fruits. A few countries, Jordan, Kenya, Lebanon, Malaysia and Morocco, have made significant progress in developing exports of fruit and vegetables, but statistics on family consumption and production of these are usually so weak that their contribution to domestic diet or farm incomes is difficult to establish. There is consequently some reluctance to devote large-scale international support to research on these foods (which some people argue are mainly consumed by higher income groups) in preference to high energy staples or high protein crops.

While there are grounds for hope that the progress achieved with wheat and rice will be maintained and extended to other food crops, there still remains a very large field for research even on the main staples. This involves not only plant breeding and genetics, but plant physiology, agronomy, crop protection, mechanization and cultural practices.

Although so much of past effort has gone into biological research that there is a tendency to argue for a shift in emphasis, there are still exciting possibilities for genetic engineering, for manipulation of plant structure and habit to achieve a higher output of grain relative to vegetative material, for improving reproductive efficiency, increasing resistance to disease, pests and climatic hazards, and furthering understanding of population dynamics. Important reasons for giving this type of research high priority are that the resultant technology is relatively scale neutral and that it appears to offer the best opportunity for maintaining productivity without polluting the environment through using more and more inputs (for example, biological resistance to pests, development of symbiotic nitrogen fixation). It also tends to economize on scarce factors of production — land and/or water and capital — and not on labour. Hayami and Ruttan[41] have concluded that much of the early success of research strategy in Japan and the United States resulted from this approach, although in the former country the emphasis was on raising yields to economize on land and in the latter it was on the use of machinery to save labour.

A field in which much remains to be done is that of ruminant livestock, which are of special importance in the agricultural economy of areas with difficult environments (mountainous, low rainfall) where they may represent almost the entire source of livelihood. Compared with pig and poultry production, where considerable progress seems possible by applying knowledge already available from developed countries, increasing the productivity of ruminants raises difficult research problems. These merit higher priority, but an approach integrating the technical aspects of feeding, production and health with the study of social and economic constraints and incentives, including marketing arrangements, is likely to be essential for success.

3. Developing improved agricultural systems

The question of whether to attack the problem of raising income and output from agriculture through a "systems" approach or through concentrating resources on a single key commodity is a source of controversy comparable to arguments that have raged on whether a steamroller or a spearhead strategy should have been followed by military commanders at certain stages of the two world wars. The undoubted success of the narrow front strategy of the international centres working on rice (IRRI) and wheat (CIMMYT) is perhaps misleading since these crops are widely grown as monocultures, and CIMMYT has not been so successful with maize which is grown by small farmers as a rotation crop and in a more diverse range of conditions than either wheat or irrigated rice.

While it is true that concentration of effort helps to maximize returns from scarce resources there are agricultural situations in which a broader approach is essential if the goals of raising productivity by the most effective use of total human and natural resources are to be achieved. This has led the two newer international tropical institutes to cover a wider range of crops and/or livestock as well as to work on developing improved farming systems, as at the Nigerian institute. This has already led to some criticism that their net is being spread too wide, but there are considerable complexities — to which no technical solution seems feasible on the basis of a single commodity approach — such as in attempting to find a stable farming rotation which will maintain soil fertility without shifting cultivation in the humid tropical forest zone of west Africa, or in designing appropriate systems of family farming for settlement of the underutilized latosols of South America. A similar breadth is required in developing a more productive system of rainfed farming by closer integration of crops and livestock in the Near East and north Africa region[42] with fodder crops replacing fallow in rotation with wheat or barley on the pattern of the Australian system of Mediterranean agriculture, and a "stratified" movement of animals from rearing areas through improving and fattening stages on arable land or in feedlots within an organized marketing chain.

[41] Hayami, Y. and Ruttan, V.W., *Resources, technology and international development: an international perspective*, Baltimore, Md, Johns Hopkins Press, 1971.

[42] This is the only important developing region with no major international research centre or programme focused on its specific ecological and economic problems.

Although progress is unlikely to be as rapid or straightforward as with technical research on single crops, research on selected long-term problems of this type must nevertheless receive higher priority. It is important as a guide to planning decisions on resource utilization (such as the choice between intensification in areas already settled versus opening up underutilized land), to induce essential changes in production technology or social systems to meet the needs of the future, and to enable man both to master his technology and to overcome the constraints and improve the productivity of difficult environments.

A further point worthy of note is that success in raising yields of individual major crops may prove progressively more difficult as the stock of knowledge is extended. As Evenson has pointed out in an interesting mathematical analysis, supported by illustrations from actual progress in research on sugarcane breeding, the marginal productivity or the expected contribution of *additional* research can be a diminishing function of the search effort.

4. Research on agricultural raw materials

It has become increasingly evident that unless large research efforts are made on behalf of virtually all the nonfood agricultural raw materials their markets will be successively captured by synthetics and other substitutes. The basic cause of this rapid loss of competitivity by the natural raw materials lies in the explosive growth of industrial and, particularly, petrochemical technology, supported by vast resources for research, product development, and promotion for the synthetics. These have been estimated at $1 000 million per year.

For most agricultural raw materials, research is critically required at all stages of production, marketing and processing, since the chain from grower to finished product is still largely based on traditional practices and concepts: agronomic research, to raise yields and thus lower costs vis-à-vis cheaper substitutes; research into the necessary marketing and quality changes, so as to provide the final consumer with the product he requires at the lowest possible cost, on time, and in the uniformity of grade needed to match the synthetics; and product development and end-use research so as to lessen the present dependence of many agricultural raw materials on their few traditional end uses. Such research is needed not only to meet the threat posed by synthetics, but also because other attempts to improve the competitivity of the agricultural raw materials, such as commodity policy schemes (buffer stocks, quota arrangements, market access arrangements, etc.), have proved either politically impossible, ineffective or, in some cases, irrelevant. The threat of growing pollution from nondegradable synthetic products adds a further dimension to the case for greater efforts on behalf of the natural products with which such synthetics compete.

Research on individual export commodities can be financed by cesses on producers and exporters as well as interested importing interests, and there may still be scope for setting up or enlarging such self-help schemes. However, the developing countries most concerned are generally poor, and the prices of the relevant commodities low, so that self-financing schemes have been rather inadequate. An exception which virtually proves the rule is the International Wool Secretariat, which probably has more resources at its disposal than all other international research and promotion schemes put together, and is financed largely by developed country exporters.

Most other research for agricultural raw materials is carried out by private industry, generally in the developed countries. There is, however, no guarantee that such research will always be undertaken nor that its objectives will coincide with those of the producing countries; even where they do, the industry may be unable or unwilling to marshall the resources needed for success.

The key issue is thus the availability of financial resources. There is a good case for a substantial programme of internationally supported research and development for natural materials, in which FAO's role would be largely focused on agronomic research and (in cooperation with other relevant agencies) on promoting and assisting in marketing and other policy changes aimed at strengthening the competitive power of the raw materials versus synthetics. However, end-use research is also vital. This can be expensive and for the most part might have to be done in developed countries. Unless specific donors agree to support such research it could probably not be undertaken — or only at the expense of other priorities, possibly food crops. A prior task of the Consultative Group will be to devise a set of criteria to enable rational decisions to be made between the competing claims of different commodities and to identify the particular aspects of research on which to concentrate.

5. Socioeconomic research to improve agricultural performance and guide the aims of technological research

The quality of decision at policy and programme levels has suffered from a lack of data and of research directly related to the economic and social factors which impede or accelerate agricultural progress.

There are a number of difficulties to overcome in achieving a better balance between technical and social aspects of research and development, as well as in getting more value from current socioeconomic research in the rural sector. The first is one of communication: liaison and understanding between technicians, sociologists and economists are often poor, and there is a tendency to compartmentalize, even in attacking problems which cry out for an integrated or at least a coordinated approach. To increase understanding between planners and researchers should be an aim of socioeconomic studies, and one way of achieving this would be to strengthen production-oriented institutes to enable them to cover aspects related to production economics, systems development, and studies on social and other barriers to the adoption of new technology or on its potential second generation effects. The work at IRRI is a good example of such combined research.

An obstacle to much of this research is its location-specificity. This tends to cause fragmentation of effort, problems in coordination, and difficulties in achieving the "critical mass" necessary for effective research. It also limits the applicability of results — which may even create dangerous biases if widely publicized. Much of the recent flood of literature on the green revolution concerns a relatively small area of northern India and Pakistan, which is not typical either ecologically or structurally of much of the subcontinent and most of the rest of Asia, quite apart from its irrelevance to other continents.

A further difficulty is that economic and social problems of agricultural development, except perhaps at the farm management level, are not separable from related problems in other sectors of each national economy; and in making judgements on alternatives involving technology economic research is dependent on other disciplines besides economics. As Mosher has pointed out in a recent paper [43] the end products of most social and economic research are not themselves technologies, but analyses of situations and policy recommendations on ways in which biological, engineering, and organizational and operational technologies could most desirably be applied and combined.

There could thus be advantages of scale, and synergism of disciplines and ideas, in adopting an institutionally centralized approach, particularly in developing a methodology for more systematic quantitative and qualitative planning, sector, and multiple-goal analysis. On the other hand there may be drawbacks in trying to apply the results of any single institute to specific situations, and in the lack of close involvement with problems and contact with national planners and politicians.

Approaches to this complex question (similar to that raised earlier on how to deal with food legumes) were discussed at length at the recent Bellagio group meeting. Some members argued that a large institute would act as a catalyst and enhance the quality of the work; others favoured a research network (perhaps on a regional basis) with an agreed work programme being undertaken at various locations with different physical and socioeconomic conditions on identified tasks, for example rural employment, but with some institutional centralization for planning, for coordinating the programme, establishing seminars and distributing information, and for research on problems best tackled at a central facility. It was also suggested that perhaps a two-tier organization, with one work level aimed at more sophisticated basic studies and one concentrating on applied problems and on planning the network of studies with cooperating countries and institutes, and acting as a catalyst in stimulating training of research students, might offer a satisfactory compromise solution.

Whatever decision might eventually be reached as to institutional arrangements for reinforcing existing research in social and economic fields, it was generally agreed that research programmes at international centres were essential for the effective adoption of their technical output by farmers, and deserved strong support. It was also felt that technical assistance to national planning organizations was important to enable them to take advantage of future work undertaken at regional or international levels.

6. Linking research and development

The dependence of agricultural progress in developing countries on a well-suited technology has been stressed by Moseman,[44] who refers to the years of (wasted) attempts to use unsuitable technology in programmes where primary attention was given individually to community development, extension, cooperatives, and other institutional factors. Evenson[45] has stressed that: "Extension programmes with little substance to extend do not find a receptive audience. On the other hand, when new techniques are available, farmers demand a great deal of information."

The reverse side of the coin is shown by research programmes which continue for years without taking

[43] Mosher, A.T., *Organization of capabilities at international research institutes or other centres to deal with social and economic problems*. Paper presented to Conference on International Agricultural Development, organized by the Rockefeller Foundation (Bellagio V Conference), Bellagio, May 1972.

[44] Moseman, A.H., *Building agricultural research systems in the developing nations*. New York, The Agricultural Development Council, 1971.

[45] Evenson, R., *Economic factors in research and extension policy*. Conference on Agricultural Research and Production in Africa. Addis Ababa. 1971.

account of new national needs, and researchers who appear to conduct research for its own sake, losing sight of the objective, the application of their findings. As long as this is the case and research shows few concrete benefits there are likely to be complaints of waste of funds, and consequent pressure for reduction of research budgets.

Thus, while a constantly available stream of new technology is vital to progress, it is essential to develop at the same time means of translating its findings as rapidly as possible into effective practical use. This applies as much to indigenous research results as to the transfer of technology between countries.

Mosher[46] has identified a number of factors, in addition to technical change, as essential elements for agricultural development, including markets, local availability of supplies and equipment, production incentives and transportation, and other accelerators such as education, credit, group action, and planning. It has certainly been proved true that while successful research is the key to an impact from extension, the application of the results will move faster and farther if supported by a well-planned institutional and infrastructural package.

This may involve much more than extension and information services: improved credit facilities, input availability, changes in agrarian structure and other policies designed to give incentives to the adoption of new techniques may all be required. Moseman has suggested that the fact that research on infrastructural problems, including transport, storage, marketing and processing facilities, was not geared to the *expanding* requirements of developing nations was an important factor holding back progress in increasing agricultural production.

To ensure that such requirements are adequately catered for in advance or even in line with the availability of new production technologies again emphasizes that elements of research on socioeconomic factors should be built into, or planned and conducted in close contact with, technical research programmes. It also implies the need to test the applicability of new technologies at the farm level before an attempt is made to launch them wholesale across a country or region.

This might be done either through the use of existing projects, with appropriate modifications; through special programmes with a relatively narrow objective; or through integrated projects designed especially to link research to further development and the use of its results.

Such projects could provide invaluable facilities for testing and demonstrating the results of both national and international programmes, for example in plant breeding, particularly at the level of the smaller farmer, and would thus multiply the impact of such research within the development process. They would offer opportunities not only for the evaluation of new technology, but means of identifying social, economic or institutional constraints to its adoption (including gaps between research and extension, and poor input or credit facilities), and the possibilities of second generation effects. Bringing research to the user not only helps to clarify such problems, but creates awareness in scientists of the real difficulties of using research as a tool of productivity, and generates the two-way process of feed-in/feed-back of ideas and results. It has also been shown, for example in Mexico[47] and Malawi,[48] that such projects can have an extended benefit — they not only further the adoption of new technology, but may generate new and more appropriate patterns of development which can be applied to other crops or agricultural areas, and which involve both the public and private sectors, thus accelerating the whole process of growth.

While using ordinary field projects as vehicles for testing or adapting research results offers a large, widely spread, and rapidly available supply of testing units, this might lead to managerial difficulties and to conflicts of objectives in such projects. Experience suggests that it is important to design projects according to local social customs and levels of development — even where the objective is to effect a complete change in time, since adjustments evolved by the society itself, with appropriate guidance and leadership from government or technical assistance agencies, and which make full use of local resources, are more likely to succeed than draconian attempts to impose new technologies and structures from outside. High priority therefore needs to be given to developing prototype "linkage" projects, and this could be a fruitful field for cooperation between research institutes, international and bilateral aid agencies, and governments.

A further way in which the contribution of research to development might be evaluated, new problems or constraints identified, and the success of linkage projects monitored, would be to field small interdisciplinary teams to review results of research programmes and selected projects in specific fields (particularly those with some applied research content), with the objective of identifying reasons for success or failure in the use of technology as a basis for future planning of research and its applica-

[46] Mosher, A.T., *Getting agriculture moving*, New York, Agricultural Development Council, 1966.

[47] *New experiments and concepts in organising efforts for transforming agriculture on small farms: report on rural life projects in the State of Mexico*, by Roberto Osogo Alcalá. Paper prepared for Bellagio V Meeting. May 1972.

[48] *The Lilongwe Land Development Project, Malawi*, by Andrew M. Mercer. Report prepared for Bellagio V Meeting, May 1972.

tion. This is being considered in respect of water use and management in Asia, livestock development in Africa, and the needs of the Near East. Support for such evaluation teams on a continuing basis should be considered as part of international action to strengthen agricultural research in developing countries.

7. Research support activities

There are a number of activities which are essential to successful research, most of which are grouped in the Frascati Manual under the heading of Scientific and Technical Services (STS). These include information collection, storage, and retrieval; the exploration, collection, and storage of genetic resources (both plant and animal); surveys, both physical and socioeconomic, to improve information on natural and human resources, and so on. In respect of the latter, standardization of survey procedures (survey forms, questionnaires, sampling techniques, etc.) is most important, in order to make proper use of the data collected and to be able to collect comparable data. Lack of standardization results in the collection of insufficient, uncomparable and, sometimes, unnecessary data for a given purpose even in the same region of a country if such surveys are conducted by different agencies or by different people. FAO has been working on the development of more uniform procedures and formats for collection and recording of survey data.

Some of these can best be done on a supranational basis because of economies of scale in the purchase and use of computers and other essential or desirable equipment and to allow a more rapid or comprehensive job to be done, for example, with information systems and certain types of resource survey across river basins or oceans. Others, such as exploration and collection of genetic resources, may be more effectively done by teams with specialized local knowledge, but if the full benefit of such work is to be made universally available, cooperative arrangements for storage, including replication of storage and evaluation and distribution for use in plant breeding programmes outside the country where the collection is made, will be fundamental.

For a number of reasons, this type of activity has tended to be a poor relation of research. It does not have the same glamour, it may not have obvious practical application, it competes for resources with research, it may require action by a country which does not immediately benefit from it, it may not even be feasible or economic for a single country to undertake alone. This makes it an international responsibility, but attempts to generate support for action have had a lukewarm response, despite large investment in such programmes and the considerable benefits derived from them in the developed countries.[49]

There is a growing awareness of the importance of better intelligence related to research, not only to avoid unnecessary duplication, but also to assist in the identification of gaps and priorities. This has several aspects: building up current awareness of what is going on, where, and with what resources (the objectives of the CARIS project); exchange of information on research and consideration of its implications and possible application through expert panels, scientific seminars, and so on; collection of vital data aimed at filling gaps in statistics and highlighting problems for research through survey and sampling methods, for example, food consumption surveys.

It is essential not only to collect such information, but also to make it widely available and update it frequently. An important aim should be to improve the access of the developing countries to the research results of developed countries. Past attempts have been piecemeal, unsystematic, and are mostly outdated. This is one reason for the weaknesses in data related to research expenditure and establishments referred to earlier, which have seriously impeded appraisal of the need for support for national research, and the identification of action priorities. Lack of these data has cost the Consultative Group, as well as the private foundations, considerable trouble and expenditure in fielding missions to evaluate the effectiveness of research in progress. The CARIS pilot project aims to study the practicality and cost-effectiveness of existing systems in certain developed countries for indexing research information for storage and retrieval in relation to:

(*a*) developing a current research information system suited to the needs of all developing countries, which will enable scientific workers to communicate more effectively;

(*b*) linking this to developed country systems;

(*c*) assisting the work of TAC in appraising needs, gaps, and priorities;

(*d*) evaluating "consumer reaction" to the information directory (the end product of the system) as a basis for further refinement.

The pilot project, which is being conducted in the 14 countries of the West African Rice Development Association (WARDA) which itself has a major research programme in progress, will have the added benefit of aiding those countries by providing the information link.

[49] See, for example, the substantial economic returns to the work undertaken by the United States quoted in the *National Program for Conservation of Crop Germ Plasm*, published by the U.S. Department of Agriculture, Washington, D.C., 1971.

A second project receiving serious consideration is the creation of an international network of plant genetic resource centres, linking developed country institutes, developing countries, and international research centres involved in plant breeding work. This stems from the increasing concern, also expressed at the Stockholm Conference, at the rapid loss of irreplaceable genetic resources on which future crop inprovement largely depends.

The sources of variation of crop plants are not distributed equally all over the world, but concentrated, due to biological and historical factors, in limited regions called centres of crop diversity or of crop variability. All are situated in the developing countries. In several of them the richness in primitive types is fast disappearing as new and superior man-made cultivars replace the old varieties. However, it is to old varieties that breeders must turn for resistance, quality and other characteristics needed for further improvement of the advanced varieties. At the moment man is increasing the risk from devastating disease or pest losses by spreading the use of high-yielding varieties with a narrow gene base over large areas at the same time as the main sources of variability are being destroyed. The conservation of the primitive types of crop plants and the related wild species is an international task which requires the exploration of these resources in the field, their conservation on a long-range basis, and their evaluation and utilization in crop improvement programmes.

The proposed network would consist of a coordinating centre, including a management committee supported by a small central staff, and would be responsible for administering a central fund for exploration, conservation, training, information, and the conduct of seminars and technical meetings. It would also work to promote the participation of all interested institutions in the network; plan and supervise the establishment of new regional genetic resource centres in the main regions of crop diversity, each of which would form the focus for a network of national centres in its region. The work of national and international research centres would be linked through participation in exploration, collection and exchange of materials, provision of replicate storage, training, information and meetings, research on new technology and so on. If, as is proposed, the complete network could be established within a five-year period, an important step will have been taken in preserving the heritage of the past for the use of future generations of research workers in the prevention of hunger and the improvement of human nutrition.

Another proposal which would involve cooperation between developed and developing countries is for the establishment of an international network of feed information centres. This would organize the collection and recording of data and exchange of information on feed availability, composition and utilization — information of great value to research on animal production and nutrition. The gradual expansion of such activities will greatly strengthen the basis on which research programmes can be planned, as well as accelerating their implementation and reducing needless duplication.

Conclusions

While research helped to maintain growth in the agricultural sector during the first United Nations Development Decade, it is only recently that its contribution to food production in the poorer countries — particularly in Asia — has made a really significant impact. Indeed, one of the principal benefits of the green revolution has been the demonstration of what a well-supported and planned agricultural research thrust can accomplish.

This chapter has attempted to outline the magnitudes of the gap between developed and developing countries in agricultural research; the slender nature of the resources likely to be available to help close this gap; the consequent need for determining priorities, and the difficulties this involves; finally, some important fields for action have been identified and current progress and future possibilities briefly discussed.

Although for some years to come most developing countries will need to rely on developed countries for research leading to a better understanding of basic processes, this does not imply a continuing scientific and technical neocolonialism. It can be avoided if there can be a closer partnership in identifying the needs of the developing countries, and in the planning of approaches and resource allocations to meet those needs.

While basic research will continue to contribute to agricultural progress as it has in the past, it is applied or adaptive research which is likely to be of greatest immediate significance to the developing countries. This could be compared to a chain whose weakest link will determine the strength of the whole; it is therefore crucial to examine these links to see how they fit together, how they can be complementary and mutually reinforcing, and where there might be dangers of neglect (or overemphasis) which could be sources of weakness.

Working from the general to the particular, the main links in this chain are: the large, *internationally supported multidisciplinary research centres* (for example, CIMMYT, IITA), which may have global or regional responsibilities (or both); *cooperative research programmes* (usually, but not necessarily, with international support), which may be focused

on commodity and/or ecological zone research problems (for example, the Asian Coconut Community, the West African Rice Development Association), on research support activities such as the collection and conservation of genetic resources, or on research on problems not specifically commodity oriented, such as water use and management (for example, USAID's Near East-South Asia Regional Irrigation Practices Seminars); *national research programmes* (for example, Pakistan's cereal disease research stations of the Department of Plant Protection); and, finally, the links from any of these to *the adoptive process*, as described earlier.

The role of each of these is crucial and they are (or should be) mutually supporting and synergistic: a feed-in/feed-back mechanism up and down the chain is also essential, although this must largely be created by mutual consensus and liaison, rather than grafted onto the system by some specific mechanism. International action can be of critical importance at every stage: in identifying priorities, in stimulating action and mobilizing resources, in coordinating their utilization; and in financing and assisting in the implementation of specific operational research or research support activities related to those priorities on a basis which will give the continuity essential for sound research and securing competent staff. This is a problem which despite the establishment of the Consultative Group has not yet been adequately resolved. The way in which these resources might best be utilized is now examined.

MULTIDISCIPLINARY INTERNATIONALLY SUPPORTED RESEARCH CENTRES

These are uniquely equipped to undertake research on problems of international or regional significance that cannot be handled adequately by existing research resources in, or on behalf of, developing countries, and which require a strong multidisciplinary research effort for their solution. Such problems will usually be technical, but it is now widely accepted that such centres can also play a valuable role in designing improved systems of agriculture and in identifying and helping to overcome social or economic obstacles to, or side effects of, technology. The establishment of a centre or centres specifically for socioeconomic research is not excluded from future consideration.

As Wortman[50] has pointed out the research work of such centres may indicate new horizons or standards of productivity by which performance elsewhere can be judged, as well as indicating the means by which these higher objectives can be reached.

Their potential goes further than research itself. Institutions of this nature can provide a focal point for specialized information and materials to which other research centres can turn for assistance, as well as for bringing together scientists from many countries for the exchange of knowledge and ideas. Not infrequently such contacts can lead to further cooperative work of an operational nature as well as to better coordination of work in progress. Finally, they are playing an important role in helping to build national research capacities through the training and guidance programmes which consume a considerable and perhaps increasing share of their budgets. The financial backing, charters and boards of governance of these centres are drawn up to enable them to act independently of government support and management and thus allow them to work on an apolitical basis.

The successes achieved by CIMMYT and IRRI have perhaps given an impression that this type of institution is universally applicable. This, of course, is not true; such centres have played and will continue to play a key role in research on behalf of the developing countries, but they are not applicable or necessarily the best approach to all research problems and are expensive to build and equip and to run. While the latter is not necessarily an argument against establishing international centres (the benefits relative to costs of CIMMYT and IRRI would probably significantly outweigh those of most major irrigation schemes, and with the same period to full maturity), it is by no means certain that the scale and speed of adoption of their results would be repeatable in respect of other crops or problems. Moreover, the resources in sight do not permit the establishment of many more comparable centres. They must therefore be regarded as an essential component of the pattern but not as a panacea.

COOPERATIVE RESEARCH PROGRAMMES

An alternative approach well suited to problems of common interest to a large number of countries, and which may not need a large multidisciplinary central staff or much sophisticated equipment, is the research network. Normally this would involve some central board of governance and a small core of staff to provide continuity and to plan and coordinate activities, and there might be centralization of some research, for instance on methodology, and information and training activities, and of specialized equipment such as a computer.

This type of organization could be applied to regional, ecological, or commodity-oriented research of an applied nature, possibly with links to international centres working in the same field, and might be appropriate for research on the food legumes, or on social and economic problems. Certain as-

[50] *Op. cit.*

pects of such programmes, for example protein assay, might be undertaken by institutes with specialized facilities in developed countries; the new International Potato Centre is proposing to lean quite heavily on such cooperative arrangements, thus keeping down its capital costs and reducing recurrent expenditures on highly specialized activities.

This approach also seems particularly suited to certain (and possibly to most) supporting activities which have to cover several countries, including some types of survey, information collection, storage and retrieval systems and the collection, conservation, storage and exchange of genetic materials.

Flexibility is essential. Distinctions between regional, crop-specific or global institutes may be largely artificial; IRRI, for example, was originally mainly regional in its coverage, although undeniably crop-specific; it has since become global in its work on rice and has begun to broaden the base of its activities in southeast Asia through its multiple cropping programme. IITA undertakes specific agricultural systems work in one ecological region of the humid tropics in which it also carries out adaptive research on rice and maize varieties developed by IRRI and CIMMYT respectively; it also claims global responsibilities for work on certain food legumes, yams and sweet potatoes, embracing all areas where its research on these crops can help raise their yield and quality. The work of the Rubber Research Institute in Malaysia, although national in its support and origin, has certainly been global in its impact on the technology of both production and processing. A regional programme covering an ecological zone of great population density might have much greater impact than a global programme centred on a commodity or problem of small economic importance, or affecting few or privileged people.

BUILDING NATIONAL RESEARCH EFFORT

This leads to the heart of the problem: how to ensure that technology arising from research is freely available to the mass of its potential beneficiaries.

No internationally-supported research programme working in a vacuum will achieve its objectives. These objectives must be in line with a broad consensus of national needs, and national programmes must be strong and flexible enough to take the results and adapt them to their local natural and human environment. If they do not fit they must reject them, and explain why.

Over and above the development of synergism between national and international activities, there is the fact that many national problems will be too specific and not of sufficiently wide importance to merit an international programme. Teff is the main cereal of Ethiopia, but is hardly grown elsewhere; currants are of great importance to Greece; certain livestock are important in Bolivia and Peru but of no continental significance; jute is important mainly in India and Bangladesh, but is crucial to the latter's economy. These national problems need strong and well-planned national research organizations. A number of models have been developed, for example the All-India Cooperative Programmes, but few comparative studies appear to have been made.

Evenson[51] states that only 11 percent of world investment in agricultural research and 20 percent of extension investment are undertaken by the developing countries. While these figures are based on incomplete data, the indications are that the developing countries do not or cannot invest sufficiently in their own future. Since extension without adequate technology is unprofitable, and technology cannot be transferred wholesale, research and related educational and training needs should be given higher priority in national planning.

However, it is not merely expenditure, but the scale, thrust and organization of the research which determine the results. Here again, data quoted by Evenson suggest that there is much room for improvement. Research stations are often small and underequipped and their work fragmented between too many different programmes to be effective. The lessons of the success of the multidisciplinary institutes have either not been appreciated or are impeded by local struggles for resources, poor programming, or lack of trained personnel.

While the funds of the Consultative Group are not meant for direct support to operational national research, and if so utilized would soon be dissipated, this does not preclude more international support being given to strengthening national capacities. Indeed, a sound division of international assistance between global and regional research on the one hand, and national effort on the other, is essential.

Support to national activities has to be looked at in the light of national needs as well as national capacities, which implies a dialogue between technical assistance agencies and national planners as well as with research directors. Such support could include guidance in programming, administration and the establishment of appropriate institutions as models for new programmes; training in research techniques and training of research directors, managers and administrators; information, seminars and other supporting activities; financial assistance to and, in some cases, operational involvement of expatriate staff in research stations or programmes.[52]

[51] *Op. cit.*

[52] IBRD has recently broken new ground by investing in the support of a greatly strengthened and remodelled national research programme in Spain. FAO has assisted in the establishment and initial operations of research establishments in several countries, including Cyprus, Ethiopia, the Libyan Arab Republic, the Syrian Arab Republic and Thailand.

ANNEX TABLES

EXPLANATORY NOTE

FAO index numbers of agricultural, fishery, and forest production and trade

Production index numbers[1]

The indices of agricultural production are calculated by applying regional weights, based on 1961-65 farm price relationships, to the production figures, which are adjusted to allow for quantities used for feed and seed. The indices for food products exclude coffee, tea, tobacco, inedible oilseeds, animal and vegetable fibres, and rubber. They are on a calendar year basis and are therefore not comparable with the indices for crop years published in the 1966 and prior issues of this report.

For fishery production, quantities are weighted by the average unit values of fishermen's landings in 1957-59. For forest production, roundwood production is weighted by 1961-65 prices.

Trade index numbers

The indices of the volume of exports and imports of agricultural products are obtained by applying the 1957-59 average unit values to the volume figures for individual products.

Average unit values are calculated on a regional basis, using quantity and value data covering a minimum of 85 percent of the region's total trade in each product. The unit values for individual products are weighted by the average volume of trade in 1957-59.

Because of difficulties concerning exchange rates and the pricing of barter transactions, the trade of eastern Europe and the U.S.S.R. has been priced at the world average unit values.

The indices of agricultural trade were revised in 1968, and the present series are not comparable with the indices for earlier years published in the 1967 and prior issues.

As far as possible, the indices for trade in fishery and forest products are calculated in the same way as those for agricultural products.

Regional coverage

The regional grouping used in this publication follows the recently adopted "FAO country classification for statistical purposes." The coverage of the groupings is in most cases self-explanatory. It should be noted, however, that in line with the decision to divide countries into three broad economic categories (developed market economies, developing market economies, and centrally planned economies) Japan, Israel and South Africa have been removed from Far East, Near East and Africa respectively and are presented under the separate heading of "Other developed countries." For this reason, tables for the three regions are not always comparable with those shown in earlier issues.

Among other regions, it should be noted that western Europe is defined as including Yugoslavia, and the Near East as extending from Cyprus and Turkey in the northwest to Afghanistan in the east, and including from the African continent Egypt, the Libyan Arab Republic and the Sudan.

[1] For full details, including a list of weights, see FAO, *Production yearbook 1971*, Rome, 1972.

ANNEX TABLE 1. – VOLUME OF PRODUCTION OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons											
World [1]												
AGRICULTURAL PRODUCTS												
Wheat	221.66	211.89	237.69	217.73	251.58	241.38	284.45	271.33	305.57	287.09	287.83	320.56
Barley	77.87	69.98	84.25	86.66	93.65	89.63	100.05	102.21	113.92	118.96	120.00	131.58
Oats	57.21	49.15	48.60	45.61	42.51	44.70	46.63	48.76	52.20	53.06	52.96	54.83
Maize	186.17	187.16	188.59	199.41	191.88	201.79	216.05	238.29	224.99	237.62	231.83	274.58
Rice (milled equivalent) [2]	103.37	105.73	106.74	113.39	117.24	108.96	108.46	120.03	126.01	129.89	133.68	132.74
Sugar (centrifugal)	51.55	52.13	49.56	52.12	60.10	60.81	61.29	64.58	63.84	64.24	70.64	71.01
Apples [3]	20.94	14.83	19.34	18.16	19.11	18.94	18.62	21.65	19.98	22.68	21.01	20.22
Citrus fruit	22.14	23.08	23.76	23.68	24.49	26.65	29.80	32.63	31.99	35.59	36.65	37.55
Bananas	18.99	19.88	20.44	21.49	22.90	24.87	26.05	26.46	26.35	27.89	28.95	29.86
Olive oil	1.40	1.50	1.00	1.95	1.00	1.36	1.36	1.50	1.58	1.36	1.47	1.66
Soybeans	17.02	20.70	20.61	21.24	21.15	25.51	28.07	29.54	33.14	34.07	34.84	36.83
Groundnuts	12.01	12.60	13.46	13.65	14.18	13.66	14.01	15.00	13.59	14.42	15.04	15.58
Cottonseed	15.89	15.97	17.35	18.43	18.35	18.70	17.03	16.43	18.21	18.04	18.44	19.17
Copra	3.35	3.40	3.12	3.31	3.37	3.32	3.48	3.16	3.29	3.29	3.39	3.76
Total vegetable oils and oilseeds (oil equivalent)	19.95	21.36	21.59	22.71	22.75	24.29	24.89	25.50	26.67	26.94	28.87	30.12
Coffee	4.28	4.64	4.27	4.07	3.24	5.11	3.88	4.47	3.88	4.29	3.93	4.87
Cocoa	1.22	1.18	1.20	1.24	1.55	1.22	1.33	1.38	1.23	1.42	1.49	1.54
Tea	0.83	0.90	0.90	0.93	0.96	0.97	1.03	1.03	1.07	1.09	1.12	1.14
Wine	24.35	21.98	28.52	25.83	28.52	28.86	27.30	28.53	28.33	27.76	30.13	28.84
Tobacco	3.25	3.19	3.52	3.78	4.10	3.76	3.81	4.04	3.90	3.83	3.90	3.82
Cotton (lint)	8.66	8.65	9.50	10.07	10.06	10.29	9.29	8.56	9.86	9.79	10.06	10.36
Jute [4]	2.14	3.30	2.79	2.94	2.86	3.03	3.25	3.30	2.16	3.16	3.01	2.87
Sisal, henequen and other agaves	0.76	0.77	0.80	0.84	0.88	0.87	0.86	0.80	0.78	0.77	0.76	0.75
Wool (greasy)	2.47	2.52	2.50	2.57	2.53	2.54	2.62	2.65	2.74	2.74	2.71	2.69
Rubber	2.00	2.10	2.14	2.20	2.28	2.36	2.46	2.43	2.65	2.89	2.92	3.05
Milk (total)	339.12	345.48	348.65	346.45	352.26	367.53	376.53	384.20	392.15	394.00	397.58	397.59
Meat [5]	59.96	62.80	65.08	67.36	67.64	70.34	73.59	77.09	79.66	81.30	84.20	87.35
Eggs	12.56	13.10	13.38	13.49	14.04	14.35	14.88	15.76	16.26	16.85	17.79	18.43
FISHERY PRODUCTS [6,7]												
Freshwater and diadromous fish	6.61	6.96	6.09	6.57	7.58	8.57	9.25	9.01	9.31	9.81	11.24	11.70
Marine fish	29.21	32.19	34.04	34.92	39.54	39.65	42.96	45.97	48.66	47.21	52.58	52.40
Crustacea, molluscs and other invertebrates	3.56	3.52	3.77	4.15	3.90	4.12	4.28	4.53	4.96	4.76	4.92	4.90
Seals and miscellaneous aquatic mammals	—	—	—	—	—	—	0.01	—	—	0.01	0.01	0.01
Miscellaneous aquatic animals and residues	0.20	0.20	0.24	0.22	0.27	0.24	0.14	0.15	0.16	0.10	0.13	0.15
Aquatic plants	0.58	0.69	0.79	0.69	0.58	0.65	0.69	0.83	0.84	0.76	0.87	0.85
FOREST PRODUCTS												
Fuelwood [8]	873	880	890	922	936	947	953	949	951	958	967	975
Industrial roundwood [8]	994	981	1 002	1 016	1 074	1 094	1 115	1 139	1 162	1 193	1 232	1 244
Sawn softwood [8]	258.3	256.6	259.1	266.6	281.4	285.8	282.6	284.8	297.0	301.9	303.5	318.4
Sawn hardwood [8]	68.0	69.2	70.6	74.2	76.9	77.8	79.7	81.5	82.9	88.3	90.7	90.8
Plywood [8]	15.4	16.4	18.1	20.1	22.2	24.2	25.2	26.3	29.5	30.5	32.5	35.7
Fibreboard	4.3	4.6	5.0	5.4	6.0	6.3	6.2	6.4	7.0	7.5	7.6	8.0
Mechanical wood pulp	18.0	18.4	18.8	19.4	20.5	21.4	22.5	22.1	23.4	25.0	25.3	25.0
Chemical wood pulp	40.6	43.6	45.7	49.7	54.1	57.4	61.7	64.0	69.7	75.1	76.2	77.0
Newsprint	13.7	14.0	14.3	14.6	15.9	16.6	17.9	18.1	18.8	20.4	20.8	21.1
Paper and paperboard other than newsprint	57.5	61.0	63.8	68.1	73.2	77.8	83.4	85.3	92.6	99.8	102.1	104.9

See notes page 172.

ANNEX TABLE 1. – VOLUME OF PRODUCTION OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons											
Western Europe												
AGRICULTURAL PRODUCTS												
Wheat	39.60	37.64	47.88	41.55	46.84	48.90	44.61	52.16	51.83	50.14	47.69	56.59
Barley	22.15	22.54	25.92	28.50	29.53	30.90	32.57	37.95	37.91	39.49	35.96	42.01
Oats	13.29	12.96	12.63	12.62	11.96	11.86	11.89	13.40	13.09	12.53	11.96	13.88
Rye	7.04	5.41	6.03	5.85	6.34	5.40	4.86	5.56	5.59	5.12	4.74	5.36
Maize	14.90	13.20	12.45	15.21	15.44	14.90	18.29	17.89	19.32	21.72	23.29	25.31
Sugar (centrifugal)	9.92	7.80	7.34	8.56	10.21	9.08	9.47	10.15	10.39	11.13	10.69	12.49
Potatoes	79.85	73.07	74.02	80.64	68.48	63.17	65.04	69.01	66.43	59.88	63.41	60.60
Apples	13.52	7.87	11.93	10.02	10.44	10.75	9.79	12.16	10.65	12.18	11.17	10.30
Citrus fruit	3.27	4.07	3.25	4.26	4.44	4.55	5.15	4.93	5.15	5.91	5.51	5.45
Olive oil	1.09	1.23	0.80	1.63	0.65	1.10	1.06	1.18	1.21	1.16	1.16	1.29
Rapeseed	0.27	0.38	0.53	0.41	0.65	0.77	0.61	0.94	1.02	0.98	1.05	1.26
Total vegetable oils and oilseeds (oil equivalent) [1]	1.34	1.55	1.20	2.02	1.12	1.60	1.53	1.74	1.82	1.81	1.84	2.13
Wine	16.64	14.22	19.93	16.69	19.74	19.44	18.34	18.83	18.62	17.67	20.37	17.67
Tobacco	0.28	0.21	0.26	0.34	0.38	0.37	0.33	0.37	0.32	0.29	0.31	0.30
Cotton (lint)	0.14	0.20	0.21	0.20	0.15	0.16	0.18	0.17	0.18	0.17	0.17	0.17
Milk (total)	102.03	104.52	105.89	105.36	105.49	108.95	111.30	113.83	116.51	116.21	117.73	114.18
Meat [5]	13.99	14.84	15.59	15.86	16.07	16.60	17.17	17.95	18.67	18.82	19.78	20.78
Eggs	3.32	3.44	3.55	3.70	3.91	3.82	3.96	4.02	4.20	4.38	4.69	4.76
FISHERY PRODUCTS [7]	7.72	7.96	8.24	8.50	9.18	10.27	10.91	11.29	10.99	10.43	11.01	11.13
FOREST PRODUCTS												
Fuelwood [8]	77.4	74.6	72.5	70.9	64.4	62.6	58.2	55.2	52.9	49.4	47.7	46.5
Coniferous logs [8]	70.5	71.0	70.5	66.9	75.1	76.0	74.5	75.1	74.9	80.0	85.0	83.0
Broadleaved logs [8]	19.4	20.3	20.5	21.2	22.5	23.0	23.7	23.6	23.2	24.2	25.4	25.5
Other industrial roundwood [8]	75.7	81.8	82.9	78.1	82.1	82.9	84.7	90.2	83.4	90.5	100.3	96.0
Sawn softwood [8]	40.1	40.4	39.8	39.1	42.1	42.0	41.3	41.9	43.3	46.0	47.7	49.3
Sawn hardwood [8]	8.8	9.3	9.1	9.4	10.2	10.6	10.8	10.9	11.1	11.5	11.7	12.0
Plywood [4]	2.1	2.1	2.2	2.5	2.6	2.6	2.6	2.7	2.8	3.1	3.1	3.2
Fibreboard	1.6	1.7	1.7	1.8	2.0	2.0	1.9	1.9	2.0	2.1	2.2	2.2
Particle board [8]	1.6	2.0	2.4	3.0	3.6	4.5	5.1	5.9	7.0	8.5	9.6	11.2
Mechanical wood pulp	5.4	5.6	5.6	5.8	6.2	6.4	6.7	6.5	7.1	7.6	8.0	7.5
Chemical wood pulp	9.8	10.6	10.8	11.8	13.1	13.8	13.8	14.6	15.2	16.4	17.1	16.6
Newsprint	4.0	4.1	4.1	4.1	4.4	4.7	4.9	4.9	5.0	5.3	5.6	5.5
Printing and writing paper	4.4	4.8	4.8	5.3	5.7	6.0	6.7	7.1	8.1	9.0	9.6	9.8
Other paper and paperboard	11.7	12.3	12.7	13.9	14.8	15.5	15.9	16.1	17.4	19.1	19.7	19.7
Eastern Europe and U.S.S.R.												
AGRICULTURAL PRODUCTS												
Wheat	77.23	80.04	84.70	63.15	88.83	78.25	118.59	98.08	114.43	100.57	118.90	123.32
Rye	27.81	28.06	26.73	21.92	23.78	27.64	23.65	23.65	25.58	21.66	20.58	23.27
Barley	22.36	19.28	25.96	25.95	34.73	27.18	34.89	32.39	36.92	41.53	46.77	44.80
Oats	17.53	14.30	10.82	8.79	9.48	10.37	13.70	16.61	16.47	18.25	19.04	19.80
Millet and sorghum	3.35	3.00	2.89	1.96	3.62	2.31	3.27	3.36	2.77	3.43	2.20	2.14
Maize	21.15	27.67	25.86	23.27	26.82	19.34	23.32	22.27	22.26	27.66	23.22	24.55
Pulses	3.69	4.98	8.51	8.99	12.05	7.86	8.27	7.65	7.93	8.72	8.51	7.87
Cotton (lint)	1.48	1.54	1.51	1.78	1.82	1.96	2.09	2.07	2.01	1.93	2.37	2.40
Flax (fibre)	0.51	0.49	0.54	0.48	0.44	0.58	0.56	0.61	0.51	0.59	0.55	0.56
Sugar (centrifugal)	9.90	10.26	9.73	9.63	14.39	12.55	12.85	14.45	13.78	12.20	12.67	11.95
Total vegetable oils and oilseeds (oil equivalent) [9]	2.57	2.99	3.10	3.00	3.74	3.80	4.33	4.62	4.65	4.23	4.46	4.43
Sunflowerseed	4.92	5.65	5.74	5.26	7.03	6.45	7.35	7.89	7.97	7.77	7.42	7.07
Potatoes	148.65	148.45	130.91	141.52	167.15	152.14	159.11	169.23	177.53	155.38	169.30	151.71
Milk (total)	90.53	91.77	92.16	89.40	91.97	102.93	108.49	113.47	116.28	115.65	117.27	117.90
Meat [5]	11.28	11.52	12.11	12.60	11.43	13.15	13.97	14.92	15.21	15.32	15.67	16.58
Wool (greasy)	0.43	0.44	0.45	0.45	0.42	0.44	0.45	0.48	0.51	0.48	0.51	0.52
Eggs	2.41	2.57	2.58	2.47	2.45	2.65	2.79	3.00	3.08	3.19	3.48	3.75

See notes page 172.

ANNEX TABLE 1. – VOLUME OF PRODUCTION OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons											
FISHERY PRODUCTS [7]	3.40	3.63	4.02	4.47	5.05	5.73	6.02	6.54	6.94	7.39	8.23	8.40
FOREST PRODUCTS												
Fuelwood [8]	124.8	113.7	112.5	118.1	124.5	120.7	117.9	112.5	106.8	103.6	101.9	100.0
Coniferous logs [8]	170.7	171.5	171.3	173.0	178.1	145.5	144.4	154.7	156.2	157.9	161.5	161.5
Broadleaved logs [8]	34.5	32.5	34.1	34.4	35.5	30.4	30.6	32.5	33.1	33.7	34.2	34.5
Other industrial roundwood [8]	106.3	101.3	104.2	112.8	116.7	151.3	151.0	155.0	157.9	152.1	161.1	163.8
Sawn softwood [8]	105.4	104.1	104.3	105.1	111.4	111.7	108.5	110.2	111.3	113.1	114.0	114.0
Sawn hardwood [8]	20.0	20.2	20.6	21.1	19.1	19.0	18.8	19.3	19.5	19.7	20.8	20.7
Plywood [8]	1.9	2.0	2.2	2.2	2.4	2.4	2.5	2.6	2.6	2.8	2.9	3.1
Particle board [8]	0.4	0.7	0.9	1.1	1.4	1.7	2.0	2.5	2.7	3.0	3.4	3.8
Fibreboard	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.7
Mechanical wood pulp	1.5	1.6	1.6	1.7	1.7	1.8	2.0	2.0	2.1	2.1	2.1	2.1
Chemical wood pulp	3.7	3.9	4.1	4.3	4.3	4.6	5.1	5.6	6.0	6.3	6.8	7.3
Newsprint	0.7	0.7	0.8	0.8	0.9	1.0	1.2	1.3	1.3	1.4	1.4	1.5
Printing and writing paper	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.8	1.9	1.9	2.0	2.0
Other paper and paperboard	3.8	4.0	4.2	4.4	4.7	5.2	5.7	6.0	6.4	6.7	7.2	7.6
North America												
AGRICULTURAL PRODUCTS												
Wheat	50.98	41.25	45.11	50.90	51.28	53.48	58.22	57.57	60.58	58.36	46.31	59.03
Barley	13.55	11.00	12.93	13.37	12.07	13.29	15.12	13.53	16.29	17.46	17.97	23.17
Oats	22.89	19.04	22.29	20.89	17.72	19.62	17.41	16.15	19.23	19.52	18.86	18.32
Maize	99.90	92.13	92.45	103.01	89.85	105.26	106.27	122.79	113.66	118.27	106.69	143.47
Sorghum	15.75	12.20	12.96	14.87	12.44	17.09	18.16	19.20	18.79	18.98	17.69	22.74
Rice (milled equivalent) [2]	1.61	1.60	1.95	2.01	2.16	2.25	2.51	2.64	3.07	2.68	2.47	2.49
Sugar (centrifugal)	3.79	4.08	4.28	5.04	5.25	4.87	4.94	4.93	5.51	5.20	5.21	5.48
Potatoes	13.62	15.32	14.15	14.40	13.10	15.30	16.42	15.99	15.75	16.51	17.29	16.73
Apples	2.54	2.92	2.99	3.08	3.28	3.17	2.99	2.89	2.88	3.51	3.25	3.16
Citrus fruit	7.28	6.93	7.89	5.95	5.67	6.95	7.96	10.37	7.56	10.18	10.29	10.83
Soybeans	15.24	18.65	18.39	19.16	19.27	23.23	25.52	26.78	30.27	30.86	30.87	32.10
Cottonseed	5.34	5.42	5.57	5.62	5.66	5.52	3.59	2.91	4.21	3.69	3.71	3.85
Total vegetable oils and oilseeds (oil equivalent) [9]	4.49	4.96	5.01	5.25	5.27	6.26	6.21	6.20	7.17	7.44	7.99	8.15
Tobacco	0.98	1.03	1.14	1.15	1.08	0.92	0.96	0.99	0.88	0.93	0.97	0.86
Cotton (lint)	3.11	3.12	3.24	3.34	3.31	3.26	2.09	1.62	2.38	2.18	2.22	2.28
Milk (total)	63.96	65.35	65.61	65.16	65.99	64.66	62.73	62.14	61.51	61.27	61.44	61.89
Meat [5]	17.94	18.71	18.77	19.74	21.01	20.88	21.89	22.94	23.34	23.63	24.73	25.66
Eggs	4.10	4.09	4.12	4.07	4.15	4.17	4.21	4.43	4.40	4.40	4.47	4.57
FISHERY PRODUCTS [7]	3.75	3.95	4.10	3.97	3.82	3.93	3.87	3.71	3.94	3.87		
FOREST PRODUCTS												
Fuelwood [8]	49.4	48.3	39.4	36.5	37.6	36.8	34.8	26.8	26.0	24.9	24.2	24.0
Coniferous logs [8]	188.5	176.6	193.5	196.8	208.8	212.5	216.5	214.8	233.7	227.8	226.9	240.0
Broadleaved logs [8]	34.8	33.4	35.7	38.7	39.8	41.7	41.7	39.7	38.1	38.8	37.3	36.0
Other industrial roundwood [8]	132.7	125.1	124.4	119.7	127.9	135.2	145.0	142.5	145.2	161.1	170.3	170.5
Sawn softwood [8]	80.9	79.6	82.5	87.8	91.0	93.1	91.6	89.1	96.5	95.3	93.0	106.0
Sawn hardwood [8]	15.8	15.1	15.8	17.0	18.4	18.9	19.4	18.9	18.4	21.4	20.1	19.0
Plywood [8]	8.9	9.7	10.6	11.9	13.1	14.5	14.8	14.9	16.5	15.6	16.1	18.0
Fibreboard	1.85	1.92	2.04	2.18	2.37	2.44	2.35	2.37	2.74	2.96	2.78	3.00
Mechanical wood pulp	9.67	9.60	9.86	10.12	10.78	11.13	11.76	11.42	12.07	13.01	12.52	12.50
Chemical wood pulp	23.69	25.03	26.46	28.53	31.11	32.93	35.97	36.28	40.29	43.24	41.96	42.00
Newsprint	7.89	7.96	7.95	8.05	8.66	8.98	9.87	9.79	10.11	11.06	10.86	10.90
Printing and writing paper	6.67	6.87	7.29	7.63	8.11	8.78	9.75	9.66	10.27	10.88	10.80	10.90
Other paper and paperboard	23.00	23.90	25.11	26.23	27.97	29.87	31.65	31.37	34.13	35.91	34.67	35.30

See notes page 172.

ANNEX TABLE 1. – VOLUME OF PRODUCTION OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons											
Oceania												
AGRICULTURAL PRODUCTS												
Wheat	7.69	6.98	8.57	9.17	10.31	7.32	12.99	7.89	15.25	11.00	8.18	9.00
Sugar (centrifugal)	1.55	1.55	2.13	2.06	2.29	2.30	2.69	2.67	3.17	2.52	2.88	3.10
Wool (greasy)	1.00	1.04	1.04	1.09	1.09	1.07	1.12	1.13	1.22	1.25	1.22	1.21
Milk (total)	11.65	12.18	12.30	12.49	12.82	13.19	13.70	13.30	13.38	14.27	13.51	13.55
Meat [5]	2.13	2.32	2.51	2.58	2.65	2.58	2.53	2.71	2.86	3.07	3.19	3.42
FISHERY PRODUCTS [7]	0.11	0.11	0.11	0.11	0.12	0.13	0.14	0.15	0.16	0.14	0.16	0.18
FOREST PRODUCTS												
Fuelwood [8]	7.7	7.6	7.5	7.4	7.3	7.3	7.2	7.0	6.9	7.0	6.9	6.9
Coniferous logs [8]	5.5	5.4	5.1	5.3	6.0	6.2	6.3	6.5	7.1	7.7	7.9	7.8
Broadleaved logs [8]	7.6	7.6	7.0	7.4	7.8	7.8	8.0	8.0	8.2	7.9	8.0	8.0
Other industrial roundwood [8]	2.7	2.9	2.9	3.3	3.5	3.6	3.8	3.7	3.6	4.3	4.6	4.8
Sawn softwood [8]	2.3	2.2	2.1	2.2	2.5	2.5	2.5	2.3	2.4	2.5	2.6	2.6
Sawn hardwood [8]	2.7	2.6	2.4	2.5	2.6	2.8	2.7	2.6	2.8	2.6	2.7	2.7
Mechanical wood pulp	0.30	0.30	0.31	0.38	0.42	0.46	0.43	0.44	0.46	0.53	0.61	0.67
Chemical wood pulp	0.28	0.31	0.33	0.38	0.42	0.45	0.49	0.54	0.56	0.65	0.68	0.72
Newsprint	0.18	0.18	0.21	0.26	0.28	0.29	0.28	0.30	0.30	0.33	0.39	0.42
Paper and paperboard other than newsprint	0.52	0.54	0.55	0.64	0.69	0.81	0.85	0.91	0.92	1.04	1.12	1.18
Latin America												
AGRICULTURAL PRODUCTS												
Wheat	8.01	9.51	9.74	12.80	15.61	10.48	10.55	11.74	10.46	12.79	11.29	11.42
Maize	22.46	24.34	25.53	26.10	27.88	31.08	32.70	35.14	33.57	32.95	38.04	39.25
Rice (milled equivalent) [2]	4.91	5.26	5.51	5.54	6.04	7.03	5.87	6.68	6.76	6.68	7.67	7.05
Sugar (centrifugal)	17.21	18.04	15.92	15.56	16.77	19.94	17.83	19.98	18.73	18.71	23.55	21.56
Citrus fruit	5.31	5.59	5.87	6.22	6.29	6.66	7.31	7.53	8.05	8.65	8.92	9.11
Bananas	11.55	12.04	12.28	12.84	13.93	14.75	15.01	15.81	15.90	17.03	17.69	18.34
Groundnuts	0.82	1.04	1.29	1.11	1.02	1.37	1.51	1.29	1.22	1.17	1.38	1.61
Cottonseed	2.19	2.38	2.77	2.88	2.90	2.98	2.96	2.66	3.02	3.08	2.92	2.59
Sunflowerseed	0.92	0.68	0.97	0.59	0.57	0.84	0.94	1.23	1.03	0.97	1.23	0.91
Copra	0.25	0.27	0.28	0.24	0.25	0.25	0.24	0.25	0.25	0.25	0.26	0.22
Palm kernels	0.14	0.16	0.18	0.18	0.20	0.22	0.22	0.22	0.22	0.23	0.24	0.24
Total vegetable oils and oilseeds (oil equivalent) [10]	1.64	1.82	2.12	1.95	2.00	2.20	2.27	2.19	2.24	2.40	2.63	2.54
Coffee	3.25	3.68	3.08	2.77	1.87	3.62	2.54	2.87	2.42	2.61	2.28	3.15
Cocoa	0.33	0.33	0.32	0.31	0.32	0.32	0.33	0.37	0.35	0.38	0.38	0.42
Tobacco	0.43	0.44	0.48	0.52	0.50	0.54	0.50	0.54	0.55	0.55	0.57	0.57
Cotton (lint)	1.22	1.32	1.54	1.61	1.63	1.67	1.65	1.50	1.71	1.70	1.62	1.43
Sisal	0.17	0.20	0.21	0.21	0.22	0.24	0.23	0.22	0.21	0.21	0.22	0.22
Wool (greasy)	0.34	0.34	0.33	0.34	0.35	0.34	0.37	0.35	0.34	0.34	0.33	0.33
Milk (total)	18.23	18.42	18.73	19.34	20.51	21.20	22.10	22.11	23.09	23.64	23.67	25.22
Meat [5]	7.16	7.64	8.03	8.39	8.00	8.26	8.65	8.99	9.72	10.17	10.02	9.70
Eggs	0.91	0.95	0.96	1.00	1.06	1.12	1.21	1.24	1.30	1.33	1.41	1.48
FISHERY PRODUCTS [7]	4.90	6.78	8.75	8.90	11.67	9.64	11.65	12.82	13.64	11.92	15.47	13.70
FOREST PRODUCTS												
Sawn softwood [8]	4.9	5.1	5.3	5.0	5.5	5.7	6.2	6.2	6.6	7.0	7.3	7.5
Sawn hardwood [8]	6.3	6.3	6.6	6.4	6.8	6.7	7.1	7.2	7.4	7.8	8.6	9.0
Plywood [8]	0.28	0.33	0.37	0.37	0.38	0.39	0.40	0.40	0.42	0.53	0.57	0.60
Mechanical wood pulp	0.24	0.28	0.27	0.34	0.35	0.38	0.40	0.41	0.42	0.43	0.46	0.50
Chemical wood pulp	0.35	0.47	0.53	0.65	0.71	0.79	0.89	0.94	1.03	1.11	1.20	1.30
All paper and paperboard	1.56	1.80	1.90	1.98	2.21	2.43	2.67	2.74	2.93	3.28	3.61	4.00

See notes page 172.

ANNEX TABLE 1. – VOLUME OF PRODUCTION OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons											
Far East [11]												
AGRICULTURAL PRODUCTS												
Wheat	14.71	15.32	16.61	15.41	14.57	17.43	14.96	16.35	23.62	25.99	28.14	30.38
Maize	9.92	10.16	11.48	10.83	12.50	11.37	13.00	13.61	13.85	13.66	17.05	15.29
Millet and sorghum	17.63	16.65	18.58	17.99	19.21	15.04	17.84	19.99	17.99	19.84	21.34	17.34
Rice (milled equivalent) [2]	77.02	79.06	77.72	84.04	87.44	78.16	78.14	86.39	91.48	95.62	99.57	100.72
Sugar (centrifugal)	5.86	6.80	6.45	6.99	6.57	7.60	8.10	6.36	6.42	8.41	9.45	9.28
Sugar (noncentrifugal)	5.50	7.84	7.73	7.49	8.13	8.88	8.99	8.00	8.05	9.16	9.32	9.29
Pulses [12]	13.20	14.28	13.19	13.12	11.85	13.67	11.27	10.20	13.50	12.18	13.49	12.91
Soybeans	0.66	0.69	0.65	0.61	0.66	0.68	0.70	0.76	0.80	0.76	0.87	0.80
Groundnuts	5.97	6.09	6.23	6.32	7.13	5.34	5.61	6.99	5.97	6.51	7.61	7.18
Copra	2.75	2.73	2.46	2.65	2.70	2.69	2.85	2.53	2.65	2.63	2.73	3.12
Total vegetable oils and oilseeds (oil equivalent) [13]	5.47	5.59	5.64	5.80	5.92	5.57	5.69	6.05	6.07	6.20	6.93	7.46
Tea	0.64	0.69	0.69	0.70	0.72	0.73	0.73	0.74	0.76	0.75	0.77	0.78
Tobacco	0.70	0.69	0.76	0.76	0.79	0.80	0.80	0.88	0.95	0.93	0.91	0.91
Cotton (lint)	1.35	1.26	1.49	1.60	1.50	1.46	1.52	1.72	1.64	1.64	1.53	1.80
Jute [4]	2.01	3.17	2.65	2.79	2.72	2.87	3.09	3.14	2.00	2.99	2.85	2.70
Rubber (natural)	1.82	1.93	1.95	2.01	2.08	2.16	2.25	2.24	2.44	2.68	2.69	2.82
Milk (total)	32.27	32.70	33.03	33.39	33.78	34.16	34.50	35.11	35.71	36.48	37.06	37.81
Meat [5]	2.66	2.72	2.82	2.92	3.03	3.15	3.31	3.39	3.47	3.54	3.65	3.73
Eggs	0.54	0.56	0.57	0.61	0.65	0.67	0.68	0.70	0.74	0.79	0.79	0.83
FISHERY PRODUCTS [7]	4.74	4.89	5.08	5.57	6.26	6.51	7.01	7.44	8.27	8.76	9.44	9.85
FOREST PRODUCTS												
Industrial roundwood [8]	35.7	38.3	39.6	45.1	47.0	50.6	53.2	57.8	61.6	67.4	67.2	69.4
Sawn softwood [8]	0.84	1.01	1.24	1.58	1.71	1.87	1.56	1.68	1.86	1.87	2.13	2.30
Sawn hardwood [8]	8.2	8.5	8.8	9.6	10.2	10.7	11.0	12.1	11.9	12.9	13.6	13.9
Plywood [8]	0.39	0.39	0.49	0.59	0.83	1.06	1.28	1.43	1.94	2.10	2.19	2.70
Mechanical wood pulp	0.07	0.08	0.08	0.09	0.10	0.10	0.11	0.11	0.13	0.15	0.16	0.17
Chemical wood pulp	—	0.02	0.02	0.03	0.04	0.10	0.10	0.13	0.15	0.15	0.20	0.25
Newsprint	0.08	0.10	0.11	0.12	0.13	0.13	0.14	0.15	0.16	0.18	0.21	0.22
Other paper and paperboard	0.69	0.81	0.90	1.03	1.11	1.17	1.25	1.40	1.57	1.71	1.90	2.16
Near East [14]												
AGRICULTURAL PRODUCTS												
Wheat	16.75	15.78	18.13	18.15	17.34	18.60	19.52	20.87	20.80	21.31	19.95	22.55
Barley	6.22	5.73	6.98	7.37	6.00	6.62	6.62	7.08	6.85	7.27	5.65	6.32
Maize	3.56	3.40	3.58	3.65	3.74	3.88	4.17	4.08	4.16	4.26	4.30	4.29
Rice (milled equivalent) [2]	1.83	1.54	2.34	2.45	2.40	2.34	2.28	2.80	2.98	2.97	2.89	2.95
Sugar (centrifugal)	1.18	9.67	9.34	10.87	14.10	12.43	14.61	17.45	17.72	16.95	19.18	22.40
Pulses [12]	1.30	1.16	1.46	1.37	1.57	1.59	1.45	1.43	1.40	1.51	1.31	1.44
Citrus fruit	0.97	1.01	1.18	1.32	1.31	1.48	1.70	1.90	1.98	2.08	2.15	2.36
Dates	1.37	1.52	1.52	1.49	1.32	1.38	1.40	1.34	1.27	1.44	1.40	1.39
Olive oil	0.11	0.18	0.09	0.15	0.18	0.11	0.21	0.15	0.22	0.10	0.15	0.10
Cottonseed	1.84	1.71	2.16	2.17	2.24	2.43	2.22	2.23	2.40	2.62	2.57	2.86
Total vegetable oils and oilseeds (oil equivalent) [9]	0.68	0.75	0.72	0.83	0.91	0.88	0.95	0.92	0.96	1.02	1.14	1.16
Tobacco	0.17	0.15	0.13	0.16	0.25	0.19	0.22	0.24	0.21	0.20	0.19	0.20
Cotton (lint)	1.03	0.94	1.20	1.19	1.27	1.37	1.29	1.30	1.41	1.52	1.49	1.65
Wool (greasy)	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.14
Milk (total)	10.01	9.88	10.07	10.14	10.42	10.66	11.10	11.25	11.81	11.80	11.80	11.70
Meat [5]	1.40	1.47	1.54	1.54	1.55	1.63	1.69	1.69	1.76	1.84	1.88	1.95
FISHERY PRODUCTS [7]	0.39	0.41	0.43	0.49	0.52	0.50	0.49	0.55	0.50	0.57	0.63	0.65
FOREST PRODUCTS												
Industrial roundwood [8]	8.7	8.5	8.9	9.7	10.6	11.4	11.6	12.6	13.2	13.9	14.8	15.1
Sawn softwood [8]	0.81	0.81	1.13	1.16	1.37	1.48	1.96	2.04	2.23	2.41	2.48	2.50
Sawn hardwood [8]	0.30	0.28	0.36	0.38	0.43	0.53	0.53	0.60	0.61	0.71	0.78	0.83

See notes page 172.

ANNEX TABLE 1. – VOLUME OF PRODUCTION OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*concluded*)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons											
Africa [15]												
AGRICULTURAL PRODUCTS												
Wheat	4.05	2.47	4.20	4.57	3.93	4.42	2.99	3.97	5.86	4.48	5.04	5.67
Barley	3.60	2.12	3.66	4.06	3.18	3.38	2.24	3.17	5.65	4.27	4.22	4.90
Maize	8.53	8.47	8.75	9.12	9.22	9.35	11.11	10.77	10.76	11.64	10.73	11.45
Millet and sorghum	13.59	14.06	15.17	15.66	16.12	15.93	15.58	15.66	14.76	16.05	15.21	16.00
Rice (milled equivalent) [2]	2.22	2.17	2.42	2.47	2.58	2.49	2.66	2.94	2.91	3.07	3.13	3.20
Sugar (centrifugal)	1.07	1.45	1.46	1.78	1.63	1.91	1.93	2.04	2.13	2.32	2.35	2.57
Pulses [12]	3.18	3.13	3.24	3.42	3.35	3.44	3.55	3.39	3.75	4.06	4.24	4.19
Citrus fruit	1.35	1.38	1.38	1.44	1.66	1.53	1.65	1.72	1.94	2.02	2.27	2.25
Bananas	1.77	1.74	1.83	1.94	1.90	1.88	1.88	2.01	1.99	2.26	2.49	2.53
Olive oil	0.19	0.08	0.09	0.15	0.15	0.12	0.06	0.15	0.13	0.06	0.13	0.24
Groundnuts	3.76	3.99	4.42	4.45	4.26	5.03	4.92	4.51	4.49	4.47	3.68	4.31
Total vegetable oils and oilseeds (oil equivalent) [10]	3.10	3.00	3.11	3.22	3.18	3.36	3.25	3.01	3.10	3.12	3.15	3.51
Coffee	0.83	0.75	0.96	1.04	1.10	1.21	1.06	1.28	1.16	1.33	1.30	1.31
Cocoa	0.87	0.83	0.85	0.90	1.20	0.86	0.97	0.98	0.84	1.00	1.08	1.08
Wine	1.97	1.73	1.60	1.72	1.48	1.93	1.02	0.88	1.28	1.03	1.06	1.01
Tobacco	0.15	0.15	0.15	0.16	0.16	0.16	0.17	0.16	0.18	0.18	0.19	0.19
Cotton	0.31	0.24	0.30	0.32	0.35	0.35	0.41	0.41	0.45	0.54	0.57	0.54
Sisal	0.38	0.37	0.40	0.42	0.44	0.42	0.42	0.40	0.39	0.39	0.36	0.35
Rubber (natural)	0.15	0.15	0.15	0.16	0.16	0.16	0.17	0.16	0.18	0.18	0.19	0.19
Wool (greasy)	0.03	0.03	0.04	0.04	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05
Milk (total)	5.41	5.45	5.35	5.39	5.53	5.64	6.02	6.14	6.36	6.63	6.77	6.91
Meat [5]	2.22	2.25	2.26	2.26	2.30	2.38	2.49	2.57	2.62	2.70	2.79	2.87
Eggs	0.24	0.25	0.25	0.26	0.28	0.29	0.31	0.33	0.37	0.39	0.40	0.42
FISHERY PRODUCTS [7]	1.34	1.38	1.47	1.50	1.78	1.83	2.05	2.11	2.14	2.34	2.51	2.65
FOREST PRODUCTS												
Fuelwood [8]	164.0	167.2	168.7	187.6	189.5	194.6	199.5	204.5	208.1	212.5	217.3	220.0
Industrial roundwood [8]	18.5	18.3	18.5	19.6	20.6	21.6	22.1	23.0	24.0	26.4	25.3	25.1
Sawn softwood [8]	0.24	0.23	0.25	0.23	0.25	0.27	0.27	0.32	0.32	0.34	0.39	0.40
Sawn hardwood [8]	1.6	1.8	1.7	1.7	1.8	2.0	2.0	2.0	2.2	2.4	2.4	2.5
Plywood [8]	0.10	0.11	0.14	0.17	0.18	0.20	0.16	0.17	0.18	0.20	0.22	0.22
All paper and paperboard	0.09	0.10	0.08	0.09	0.10	0.10	0.10	0.13	0.14	0.17	0.18	0.20

[1] Excluding China. – [2] Paddy converted at 65 percent. – [3] Excluding centrally planned countries. – [4] Including allied fibres. – [5] Beef and veal, mutton and lamb, pork, poultry meat. – [6] World total including China. – [7] Nominal catch (liveweight). – [8] Million cubic metres. – [9] Olive oil, soybeans, groundnuts, cottonseed, sesame seed, sunflowerseed, rapeseed, linseed, hempseed, castor beans. – [10] Olive oil, palm oil, soybeans, groundnuts, cottonseed, sesame seed, sunflowerseed, rapeseed, copra, palm kernels, linseed, hempseed, castor beans. – [11] Excluding China and Japan. – [12] Dry beans, dry peas, broad beans, chick-peas, lentils. – [13] Palm oil, soybeans, groundnuts, cottonseed, sesame seed, rapeseed, copra, palm kernels, linseed, castor beans. – [14] Excluding Israel. – [15] Excluding South Africa.

ANNEX TABLE 2. – VOLUME OF EXPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons														
World [1]															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	29.56	27.68	29.37	33.29	40.83	36.92	45.19	54.46	53.78	56.45	45.95	44.29	40.44	50.72	48.30
Barley	6.35	6.50	6.18	4.93	6.19	5.62	5.05	7.18	5.91	6.04	6.66	5.71	6.39	9.72	10.44
Maize	7.07	8.80	9.99	11.12	12.47	17.49	19.08	20.08	23.43	24.72	25.70	27.92	25.72	28.19	29.38
Oats	1.44	1.46	1.40	1.28	1.14	1.34	1.20	1.39	1.67	1.33	1.19	0.99	0.98	1.50	1.54
Rye	0.73	0.62	0.59	0.56	0.70	0.77	0.64	0.50	0.40	0.44	0.36	0.29	0.24	0.38	0.80
Millet and sorghums	0 98	2.51	3.28	3.10	2.37	3.86	3.93	3.80	6.21	11.18	9.24	4.65	4.22	6.00	7.35
Rice (milled equivalent) [2]	5.49	4.82	4.77	5.50	5.69	5.49	6.33	6.56	6.87	5.94	5.63	5.29	5.64	6.20	6.86
Sugar (raw equivalent) [3]	14.61	14.42	13.34	16.13	17.22	15.51	15.19	15.14	16.59	16.10	17.56	18.16	16.81	20.21	19.81
Potatoes	1.87	2.58	2.47	2.38	2.34	2.67	2.42	2.41	2.93	2.69	2.63	2.66	3.24	3.13	2.85
Pulses (dry)	0.84	0.84	1.06	1.04	0.93	1.19	1.34	1.27	1.43	1.37	1.30	1.44	1.51	1.54	1.41
Apples	1.14	0.84	1.28	1.24	1.38	1.51	1.21	1.41	1.70	1.55	1.59	1.74	1.76	1.67	1.79
Bananas	3.36	3.53	3.68	3.88	3.98	3.88	4.03	4.23	4.54	5.17	5.45	5.88	5.93	5.98	6.48
Citrus fruit [4]	2.67	2.77	3.09	3.34	3.23	3.58	3.27	4.14	3.20	4.21	4.37	4.28	4.58	4.73	4.68
Grapes (fresh)	0.31	0.39	0.38	0.43	0.44	0.50	0.45	0.55	0.60	0.60	0.63	0.60	0.65	0.64	0.69
Dates	0.29	0.30	0.34	0.32	0.24	0.30	0.40	0.35	0.33	0.36	0.34	0.32	0.36	0.44	0.45
Vegetables oils and oilseeds (oil equivalent) [5]	5.20	4.90	5.24	5.57	5.52	5.83	6.06	6.43	6.52	6.43	6.18	6.74	6.82	8.24	7.91
Oilseed cake and meal	3.23	3.88	4.64	4.45	4.96	6.11	6.61	7.33	8.04	8.36	8.52	8.94	9.27	11.04	11.82
Cattle [6]	2.97	3.15	2.63	2.82	3.68	3.65	3.77	3.48	3.84	3.49	3.70	4.27	4.54	4.83	4.82
Sheep, lambs and goats	1.86	1.92	2.54	2.80	3.46	3.99	4.45	4.15	4.03	3.95	3.92	4.81	4.08	3.84	5.23
Pigs [6]	0.52	0.49	0.99	1.23	1.19	1.02	0.70	0.85	0.92	0.65	1.01	1.27	1.99	2.55	2.39
Meat [7]	1.50	1.58	1.71	1.74	1.85	2.21	2.57	2.58	2.54	2.58	2.72	2.87	3.29	3.56	3.77
Milk (condensed, evaporated and powdered)	0.81	0.80	0.91	0.90	0.97	1.03	1.21	1.39	1.37	1.42	1.58	1.79	1.83	2.02	2.04
Eggs (in the shell)	0.37	0.39	0.43	0.41	0.39	0.34	0.29	0.24	0.20	0.18	0.18	0.21	0.25	0.27	0.30
Coffee (green)	2.22	2.19	2.55	2.61	2.67	2.82	3.02	2.79	2.70	3.00	3.13	3.33	3.33	3.18	3.25
Cocoa beans	0.78	0.64	0.75	0.90	1.00	1.03	1.04	1.03	1.30	1.11	1.08	1.05	0.93	1.11	1.18
Tea	0.48	0.52	0.49	0.49	0.52	0.54	0.55	0.55	0.57	0.54	0.59	0.60	0.56	0.62	0.65
Wine	2.81	2.78	2.42	2.69	2.66	2.83	2.37	2.56	2.33	2.53	2.08	2.24	2.89	3.31	2.95
Pepper and pimento	0.10	0.10	0.12	0.10	0.12	0.13	0.14	0.12	0.12	0.13	0.17	0.18	0.16	0.15	0.18
Tobacco (unmanufactured)	0.67	0.66	0.64	0.68	0.77	0.77	0.76	0.87	0.84	0.80	0.85	0.82	0.83	0.83	0.86
Wool (actual weight)	1.20	1.15	1.37	1.31	1.42	1.40	1.38	1.29	1.39	1.40	1.35	1.47	1.50	1.49	1.36
Cotton (lint)	3.06	2.65	2.79	3.50	3.28	3.00	3.37	3.47	3.22	3.36	3.26	3.28	3.12	3.46	3.47
Jute and kenaf	0.81	0.95	0.89	0.83	0.76	0.99	0.90	1.00	1.13	1.20	1.07	0.99	0.84	0.83	0.77
Rubber (natural) [8]	1.96	1.97	2.28	2.01	2.22	2.28	2.24	2.24	2.31	2.22	2.25	2.63	2.94	2.87	2.95
FISHERY PRODUCTS [9]															
Fresh, chilled or frozen fish	0.87	0.96	1.00	1.14	1.15	1.34	1.48	1.71	1.72	1.80	1.79	1.82	1.81	2.02	2.02
Dried, salted or smoked fish	0.63	0.61	0.58	0.56	0.55	0.55	0.54	0.50	0.50	0.50	0.50	0.49	0.51	0.52	0.49
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	0.17	0.18	0.21	0.23	0.25	0.27	0.27	0.30	0.30	0.30	0.32	0.34	0.38	0.42	0.50
Fish products and preparations, whether or not in airtight containers	0.43	0.47	0.51	0.50	0.52	0.54	0.51	0.58	0.52	0.57	0.56	0.61	0.59	0.61	0.59
Crustacean and mollusc products and preparations, whether or not in airtight containers	0.04	0.04	0.05	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
Oils and fats, crude or refined, of aquatic animal origin	0.44	0.48	0.54	0.59	0.62	0.67	0.74	0.63	0.72	0.68	0.81	0.83	0.71	0.64	0.69
Meals, solubles and similar animal feedstuffs of aquatic animal origin	0.57	0.67	0.83	1.03	1.36	1.72	1.78	2.44	2.47	2.48	3.05	3.55	3.03	3.00	2.90
FOREST PRODUCTS [9]															
Pulpwood [10]	10.3	8.5	9.0	10.8	13.1	12.4	11.7	13.2	13.8	14.2	14.8	14.1	15.9	18.5	15.7
Coniferous logs [10]	2.1	2.7	3.3	4.2	5.9	6.4	8.7	9.9	11.6	13.8	17.2	21.1	20.4	24.4	21.6
Broadleaved logs [10]	8.4	9.4	11.8	13.3	14.0	14.2	17.4	19.3	20.7	21.9	24.2	29.0	34.0	35.7	37.9
Sawn softwood [10]	30.4	29.7	32.3	36.3	36.3	38.2	41.4	44.6	44.0	42.6	42.8	47.5	47.3	49.4	51.4
Sawn hardwood [10]	3.5	3.6	3.9	4.3	4.3	4.3	4.6	5.4	5.6	5.8	5.7	6.3	6.9	7.1	7.3
Plywood and veneers [10]	1.3	1.4	1.9	1.8	1.9	2.1	2.4	3.0	3.3	3.6	3.8	4.7	5.1	5.3	5.7
Fibreboard	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.2	1.3	1.4	1.4	1.4
Mechanical wood pulp	1.3	1.1	1.2	1.3	1.3	1.2	1.3	1.4	1.4	1.4	1.2	1.3	1.3	1.3	1.0
Chemical wood pulp	6.6	6.6	7.3	8.4	8.5	9.0	10.1	11.0	11.1	12.1	12.4	13.7	14.9	15.6	13.8
Newsprint	6.9	6.8	7.0	7.5	7.7	7.5	7.8	8.5	9.0	9.7	9.4	9.7	10.6	10.6	10.4
Other paper and paperboard	3.5	3.5	4.0	4.5	5.0	5.2	5.9	6.8	7.4	8.3	8.7	10.1	11.9	12.6	13.3

See notes page 179.

ANNEX TABLE 2. – VOLUME OF EXPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons														
Western Europe															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	3.09	3.88	3.78	3.37	3.19	3.69	5.07	5.27	6.99	6.43	5.73	8.40	10.90	9.36	6.97
Barley	1.96	0.76	0.64	1.05	2.51	1.69	2.29	3.16	2.63	3.37	4.08	4.20	4.32	4.39	3.85
Maize	0.11	0.61	0.37	0.81	1.09	0.34	0.94	1.27	1.89	2.15	2.77	2.52	3.23	3.87	5.43
Rye	0.14	0.09	0.21	0.20	0.31	0.18	0.16	0.05	0.05	0.06	0.05	0.09	0.14	0.21	0.40
Sugar (raw equivalent) [3]	1.72	1.37	1.34	1.57	1.47	1.26	1.59	1.45	1.54	1.27	1.15	1.66	1.45	1.98	2.07
Potatoes	1.35	2.01	1.80	1.58	1.75	1.83	1.64	1.70	2.26	1.98	1.88	1.86	2.41	2.22	2.05
Pulses (dry)	0.17	0.21	0.19	0.17	0.19	0.22	0.17	0.15	0.17	0.19	0.24	0.29	0.28	0.26	0.24
Apples	0.73	0.38	0.79	0.71	0.84	0.88	0.53	0.73	0.88	0.76	0.78	0.86	0.95	0.94	1.03
Citrus fruit [4]	0.96	1.20	1.35	1.47	1.49	1.73	1.22	2.01	1.91	1.97	1.94	1.79	1.92	2.29	2.00
Grapes (fresh)	0.19	0.26	0.24	0.28	0.31	0.34	0.29	0.38	0.41	0.41	0.42	0.41	0.41	0.44	0.47
Vegetable oils and oilseeds (oil equivalent) [11]	0.31	0.28	0.31	0.44	0.38	0.40	0.37	0.40	0.32	0.35	0.46	0.53	0.72	0.97	1.12
Oilseed cake and meal	0.65	0.61	0.77	0.76	0.91	0.92	0.89	1.03	1.07	1.13	1.28	1.19	1.34	1.57	1.85
Cattle [6]	1.51	1.34	1.26	1.38	1.80	1.37	1.85	1.88	1.74	1.46	2.02	2.34	2.48	2.59	2.71
Sheep, lambs and goats [4]	0.67	0.47	0.57	0.86	1.17	0.87	1.35	0.87	0.85	0.58	0.72	0.93	0.98	0.64	0.62
Pigs [6]	0.25	0.32	0.58	0.80	0.58	0.49	0.39	0.66	0.82	0.49	0.88	1.17	1.90	2.35	2.19
Meat (fresh, chilled and frozen) [7]	0.30	0.32	0.40	0.51	0.58	0.74	0.81	0.79	0.92	0.91	1.10	1.21	1.26	1.44	1.70
Bacon, ham and salted pork	0.30	0.30	0.31	0.37	0.36	0.37	0.35	0.35	0.36	0.36	0.35	0.35	0.34	0.34	0.34
Milk (condensed, evaporated and powdered)	0.45	0.46	0.51	0.58	0.64	0.69	0.72	0.75	0.90	1.03	1.17	1.38	1.34	1.44	1.51
Butter	0.25	0.25	0.21	0.25	0.26	0.23	0.24	0.23	0.27	0.27	0.31	0.35	0.33	0.49	0.45
Cheese	0.26	0.29	0.32	0.33	0.34	0.36	0.38	0.40	0.42	0.47	0.48	0.52	0.53	0.57	0.62
Eggs (in the shell)	0.30	0.31	0.34	0.31	0.29	0.28	0.23	0.19	0.15	0.14	0.13	0.15	0.19	0.23	0.26
Wine	0.88	1.17	0.75	0.91	1.01	1.01	1.26	1.21	1.19	1.30	1.31	1.32	1.45	1.79	2.18
Wool (actual weight)	0.09	0.08	0.11	0.11	0.11	0.12	0.13	0.10	0.11	0.11	0.10	0.11	0.11	0.10	0.08
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	531.6	593.2	639.2	694.0	684.5	771.7	849.9	877.0	907.7	876.5	861.2	905.6	972.5	1 096.0	1 027.0
Dried, salted or smoked fish	417.0	391.0	346.2	331.0	333.3	353.8	334.3	314.7	323.2	317.4	312.4	311.8	337.4	338.4	315.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	74.8	84.9	108.5	109.2	112.5	123.4	114.0	118.9	108.8	113.7	116.7	130.4	133.5	150.3	187.0
Fish products and preparations, whether or not in airtight containers	166.8	177.6	197.0	191.0	183.7	211.7	196.7	209.1	221.4	211.3	193.8	196.0	174.5	184.0	176.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	5.0	6.0	7.0	6.0	8.0	9.0	9.0	13.0	13.0	13.0	13.0	13.0	17.0	19.0	21.0
Oils and fats, crude or refined, of aquatic animal origin	216.8	213.7	228.4	213.7	218.8	243.9	199.8	190.0	266.2	340.1	391.6	259.8	270.0	172.0	150.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	253.0	266.0	252.8	234.6	286.2	240.2	306.9	434.8	555.0	576.8	810.4	787.4	657.0	626.6	726.0
	Million metric tons														
FOREST PRODUCTS															
Pulpwood [10]	4.55	3.76	3.93	4.60	5.93	4.28	3.34	3.62	3.61	3.01	3.82	4.17	5.22	6.71	6.15
Coniferous logs [10]	0.70	0.97	1.03	1.34	1.30	1.14	1.05	1.06	1.03	1.35	1.55	1.37	1.23	1.46	1.35
Broadleaved logs [10]	0.68	0.59	0.79	1.04	0.98	0.93	0.91	0.97	1.02	1.10	1.17	1.20	1.23	1.35	1.45
Pitprops [10]	2.90	2.32	1.90	1.62	1.81	1.37	1.07	0.83	0.56	0.54	0.36	0.39	0.49	0.57	0.48
Sawn softwood [10]	13.02	11.86	13.51	15.35	14.24	13.86	13.86	14.62	13.57	12.72	12.85	15.05	16.24	16.21	16.65
Sawn hardwood [10]	0.82	0.79	0.87	1.06	0.93	0.96	0.98	1.14	1.21	1.26	1.23	1.35	1.44	1.51	1.50
Plywood and veneers [10]	0.50	0.48	0.61	0.70	0.65	0.66	0.73	0.83	0.86	0.88	0.92	1.05	1.16	1.21	1.20
Fibreboard	0.53	0.56	0.66	0.74	0.75	0.78	0.83	0.88	0.82	0.76	0.82	0.86	0.89	0.86	0.87
Particle board	0.06	0.09	0.16	0.28	0.35	0.43	0.48	0.56	0.80	0.89	1.04	1.20	1.45	1.70	2.08
Mechanical wood pulp	1.02	0.88	0.93	1.10	1.06	0.97	1.05	1.15	1.12	1.13	1.00	1.06	1.04	1.04	0.77
Chemical wood pulp	3.84	3.90	4.36	4.73	4.50	4.80	5.36	5.86	5.79	6.24	6.15	6.54	6.76	6.72	5.60
Newsprint	1.24	1.30	1.32	1.51	1.62	1.63	1.71	1.88	1.97	2.07	2.10	2.31	2.43	2.56	2.53
Other paper and paperboard	2.57	2.49	2.84	3.25	3.57	3.77	4.23	4.77	5.06	5.54	5.67	6.49	7.74	8.10	8.35

See notes page 179.

ANNEX TABLE 2. – VOLUME OF EXPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons														
Eastern Europe and U.S.S.R.															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	5.63	4.11	6.34	5.86	5.46	5.18	4.97	2.52	2.32	4.12	7.53	6.70	8.01	6.69	...
Barley	1.33	0.38	0.19	0.43	1.18	0.61	0.69	0.76	2.14	0.39	0.53	0.67	0.82	0.72	...
Maize	0.26	0.73	0.27	0.70	1.30	2.33	1.78	1.93	1.34	0.64	1.42	0.55	0.98	1.32	...
Rye	0.45	0.47	0.55	0.76	1.15	1.35	0.89	0.17	0.06	0.32	0.44	0.28	0.30	0.25	...
Sugar (raw equivalent) [3]	0.62	1.10	1.36	1.33	3.21	3.28	2.19	1.71	2.02	2.17	2.42	2.68	2.13	2.12	...
Potatoes	0.12	0.17	0.31	0.25	0.40	0.66	0.46	1.15	0.65	0.62	0.67	0.68	0.27	0.64	...
Sunflowerseed	0.06	0.06	0.12	0.18	0.17	0.22	0.15	0.24	0.19	0.35	0.49	0.47	0.56	0.33	...
Oilseed cake and meal	0.22	0.38	0.59	0.53	0.42	0.39	0.24	0.08	0.16	0.43	0.40	0.34	0.31	0.28	...
Meat (fresh, chilled and frozen) [7]	0.12	0.10	0.31	0.14	0.20	0.27	0.27	0.17	0.24	0.25	0.35	0.34	0.30	0.24	...
Butter	0.05	0.06	0.11	0.08	0.09	0.11	0.10	0.06	0.08	0.10	0.12	0.12	0.10	0.10	...
Eggs (in the shell)	0.04	0.06	0.07	0.10	0.13	0.11	0.08	0.08	0.11	0.09	0.13	0.10	0.10	0.09	...
Cotton	0.32	0.32	0.35	0.40	0.39	0.35	0.32	0.39	0.46	0.52	0.55	0.57	0.45	0.52	...
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	1.2	2.5	5.5	9.9	17.9	33.7	80.9	88.9	178.3	229.5	215.8	236.4	229.9	309.0	338.0
Dried, salted or smoked fish	1.0	13.0	34.8	45.3	31.7	40.5	44.4	35.3	39.9	28.6	35.6	25.2	23.1	21.2	17.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	0.1	0.4	0.2	0.3	0.2	0.3	0.6	1.1	1.2	1.3	1.3	0.6	0.5	1.7	0.1
Fish products and preparations, whether or not in airtight containers	9.3	9.4	18.0	22.0	25.3	24.3	19.3	18.9	19.6	22.7	24.2	27.0	28.5	29.4	28.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	3.8	4.2	4.2	3.7	3.7	3.0	5.0	5.6	4.9	5.0	5.0	5.0	3.4	3.7	4.0
Oils and fats, crude or refined, of aquatic animal origin	4.6	5.3	8.6	35.9	18.2	15.2	32.2	40.0	57.1	71.9	58.2	59.4	64.0	34.5	15.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	3.2	3.8	7.2	4.0	4.9	3.7	3.8	4.2	7.2	14.2	38.6	30.6	28.5	13.5	11.0
	Million metric tons														
FOREST PRODUCTS															
Pulpwood [10]	1.15	1.25	1.93	2.63	3.54	4.40	5.13	6.00	6.38	7.32	7.49	6.88	7.58	8.52	7.20
Coniferous logs [10]	0.75	1.06	1.22	1.61	1.99	2.62	2.89	3.43	4.72	5.04	5.01	6.12	6.38	7.57	7.28
Pitprops [10]	1.03	1.27	1.07	1.33	1.24	1.36	1.58	1.53	1.58	1.31	0.96	0.85	0.85	0.97	0.84
Sawn softwood [10]	5.21	5.36	5.94	6.82	7.23	8.47	9.49	10.96	11.17	11.44	10.88	10.93	10.74	10.97	10.55
Plywood [10]	0.14	0.14	0.16	0.19	0.21	0.25	0.28	0.29	0.38	0.38	0.40	0.45	0.45	0.48	0.47
Chemical wood pulp	0.18	0.25	0.24	0.29	0.33	0.34	0.32	0.37	0.37	0.39	0.47	0.51	0.57	0.55	0.55
North America															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	20.27	19.18	19.64	23.30	29.84	24.98	31.11	37.45	31.63	39.44	28.70	27.42	19.85	30.28	30.70
Barley	2.55	4.25	3.83	3.01	2.40	2.59	1.62	2.48	2.11	2.04	2.02	1.03	0.80	4.15	5.16
Maize	4.52	4.57	5.59	5.61	7.35	10.81	11.12	12.14	15.21	15.60	12.97	14.96	13.96	14.40	12.99
Millet and sorghums	0.57	1.88	2.59	2.46	1.64	2.79	2.94	2.55	5.32	9.50	7.80	3.23	2.38	3.28	3.76
Rye	0.27	0.34	0.25	0.21	0.34	0.57	0.48	0.29	0.18	0.35	0.31	0.18	0.09	0.15	0.41
Rice (milled equivalent) [3]	0.74	0.57	0.69	0.89	0.80	1.05	1.20	1.33	1.47	1.28	1.72	1.71	1.66	1.58	1.48
Citrus fruit [4]	0.40	0.27	0.33	0.29	0.30	0.27	0.26	0.30	0.33	0.37	0.42	0.27	0.39	0.39	0.39
Pulses (dry)	0.17	0.18	0.31	0.24	0.16	0.26	0.34	0.28	0.30	0.32	0.28	0.27	0.35	0.40	0.35
Vegetable oils and oilseeds (oil equivalent) [12]	1.33	1.10	1.48	1.64	1.32	1.69	1.71	2.12	2.23	1.97	2.01	2.19	2.33	3.27	3.39
Oilseed cake and meal	0.61	0.44	0.93	0.83	0.79	1.37	1.69	1.95	2.47	2.60	2.75	3.00	3.28	3.97	4.40
Milk (condensed, evaporated and powdered)	0.24	0.22	0.25	0.21	0.23	0.22	0.35	0.47	0.31	0.19	0.15	0.17	0.21	0.27	0.21
Tobacco (unmanufactured)	0.24	0.23	0.23	0.24	0.24	0.23	0.25	0.26	0.23	0.27	0.28	0.29	0.29	0.25	0.24
Cotton (lint)	1.57	1.04	0.83	1.73	1.45	0.87	0.99	1.19	0.86	0.82	0.90	0.88	0.55	0.68	0.94

See notes page 179.

ANNEX TABLE 2. – VOLUME OF EXPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	148.7	148.2	139.6	147.3	141.9	157.3	159.1	197.5	216.4	240.0	224.9	252.1	234.4	219.7	234.0
Dried, salted or smoked fish	81.0	74.3	70.7	68.3	65.3	59.9	70.0	61.4	54.3	53.6	56.2	55.0	54.8	57.1	61.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	15.0	13.9	14.4	16.4	19.0	18.9	22.8	24.5	25.6	23.7	24.2	26.9	34.0	36.2	39.0
Fish products and preparations, whether or not in airtight containers	40.4	49.4	46.0	30.0	24.2	26.4	31.2	42.8	36.0	37.1	42.4	34.6	36.5	31.4	32.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	8.4	4.6	6.5	6.3	4.5	6.6	7.2	7.7	10.4	10.6	11.5	9.7	10.6	10.1	12.0
Oils and fats, crude or refined, of aquatic animal origin	57.3	52.0	82.7	80.9	61.2	61.7	129.8	87.4	58.7	41.1	46.7	37.6	103.8	94.8	118.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	48.6	29.7	46.3	34.0	38.8	46.2	54.3	60.4	57.5	51.7	50.7	66.0	74.4	79.0	73.0
	Million metric tons														
FOREST PRODUCTS															
Pulpwood [10]	4.51	3.29	2.91	3.12	3.17	3.20	2.88	3.14	3.44	3.52	3.07	2.64	2.66	2.83	2.00
Coniferous logs [10]	0.54	0.60	0.79	1.00	2.28	2.24	4.33	4.85	5.25	6.42	9.25	11.84	10.93	13.39	11.00
Broadleaved logs [10]	0.25	0.27	0.24	0.34	0.31	0.40	0.41	0.38	0.45	0.43	0.52	0.51	0.43	0.37	0.31
Sawn softwood [10]	10.22	10.76	11.38	12.55	13.28	14.50	16.68	17.36	17.43	16.51	17.25	19.16	18.27	20.06	22.00
Sawn hardwood [10]	0.57	0.53	0.64	0.62	0.55	0.60	0.59	0.69	0.74	0.91	0.81	0.66	0.75	0.67	0.80
Plywood and veneers [10]	0.13	0.13	0.22	0.19	0.21	0.29	0.31	0.45	0.47	0.52	0.62	0.67	0.72	0.68	0.69
Mechanical wood pulp	0.23	0.21	0.22	0.22	0.22	0.24	0.23	0.26	0.29	0.24	0.22	0.22	0.25	0.28	0.23
Chemical wood pulp	2.41	2.27	2.59	3.18	3.45	3.60	4.09	4.47	4.47	4.87	5.22	6.04	6.92	7.60	6.89
Newsprint	5.51	5.27	5.47	5.74	5.84	5.68	5.74	6.29	6.60	7.19	6.85	6.90	7.60	7.48	7.30
Other paper and paperboard	0.68	0.70	0.78	0.89	0.99	1.05	1.22	1.57	1.76	2.01	2.21	2.63	2.84	3.03	3.32
Oceania															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	2.56	1.42	2.68	3.60	6.41	4.79	6.44	6.82	7.25	4.79	8.69	5.39	6.57	8.27	9.24
Barley	0.64	0.32	0.88	0.38	0.95	0.40	0.28	0.36	0.38	0.25	0.43	0.12	0.55	0.74	1.33
Oats	0.09	0.07	0.38	0.22	0.39	0.27	0.31	0.37	0.31	0.25	0.42	0.17	0.35	0.25	0.57
Sugar (raw equivalent) [3]	0.98	0.89	0.84	1.04	0.99	1.40	1.45	1.60	1.47	1.66	2.03	2.49	1.78	1.92	2.08
Copra and coconut oil (oil equivalent)	0.18	0.16	0.17	0.17	0.18	0.17	0.18	0.18	0.17	0.18	0.17	0.15	0.17	0.18	0.18
Beef and veal	0.28	0.28	0.32	0.25	0.26	0.37	0.40	0.43	0.40	0.39	0.35	0.38	0.46	0.53	0.55
Mutton and lamb	0.30	0.34	0.39	0.42	0.41	0.41	0.43	0.48	0.44	0.47	0.51	0.55	0.62	0.61	0.70
Butter	0.21	0.24	0.28	0.22	0.25	0.24	0.27	0.28	0.27	0.28	0.32	0.27	0.29	0.30	0.26
Cheese	0.10	0.10	0.10	0.10	0.11	0.12	0.12	0.13	0.12	0.12	0.14	0.12	0.13	0.13	0.14
Wool (actual weight)	0.80	0.73	0.87	0.85	0.89	0.89	0.91	0.89	0.90	0.92	0.92	0.98	1.05	1.09	0.99
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	4.0	3.0	4.0	4.0	3.0	3.0	3.0	4.0	8.0	12.0	12.0	13.0	16.0	20.0	21.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	4.0	4.0	4.0	5.0	5.0	6.0	6.0	7.0	8.0	8.0	10.0	13.0	13.0	13.8	17.0
Fish products and preparations, whether or not in airtight containers	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	—	—	—	1.0	1.0	1.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	0.1	—	—	—	—	—	—	—	1.0	1.0	2.0	2.0	2.0	2.0	2.6
Oils and fats, crude or refined, of aquatic animal origin	16.0	19.0	15.0	17.0	11.0	8.0	4.0	5.3	9 0	6.0	4.0	7.0	6.0	4.2	6.4
	Million cubic metres														
FOREST PRODUCTS															
Coniferous logs	—	0.04	0.15	0.14	0.27	0.29	0.29	0.36	0.45	0.55	0.80	1.44	1.68	1.83	1.90

See notes page 179.

ANNEX TABLE 2. – VOLUME OF EXPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
								Million metric tons							
Latin America															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	2.83	2.45	2.48	2.50	1.10	2.87	1.97	4.31	7.44	5.26	2.37	2.44	2.79	2.47	1.08
Maize	0.84	1.74	2.74	3.11	1.79	3.00	3.18	3.75	4.79	5.29	6.05	5.08	5.50	6.78	7.71
Millet and sorghums	0.16	0.34	0.33	0.20	0.39	0.67	0.64	0.89	0.34	1.18	0.77	0.71	1.50	2.24	2.45
Rye	0.31	0.19	0.06	0.14	0.04	0.01	—	0.11	0.10	—	—	0.02	0.02	0.03	—
Rice (milled equivalent) [2]	0.12	0.16	0.12	0.13	0.34	0.31	0.18	0.15	0.44	0.60	0.32	0.47	0.36	0.39	0.42
Sugar (raw equivalent) [3,13]	8.64	8.83	8.17	10.01	10.92	8.94	7.69	7.64	9.27	8.60	10.14	9.52	9.28	11.73	10.78
Bananas	2.63	2.79	2.94	3.11	3.10	3.02	3.15	3.18	3.37	3.94	4.23	4.72	4.68	4.79	5.04
Vegetable oils and oilseeds (oil equivalent) [14]	0.31	0.39	0.34	0.37	0.49	0.57	0.51	0.42	0.61	0.50	0.60	0.43	0.54	0.68	0.61
Oilseed cake and meal	0.82	1.39	1.07	1.09	1.27	1.46	1.42	1.28	1.66	1.74	1.62	1.55	1.72	2.30	2.39
Cattle	0.61	0.71	0.61	0.66	0.85	1.13	0.95	0.61	0.79	0.84	0.82	0.95	1.12	1.20	1.13
Beef and veal	0.42	0.46	0.42	0.37	0.37	0.44	0.67	0.62	0.51	0.54	0.52	0.48	0.70	0.70	0.54
Coffee (green)	1.57	1.56	1.87	1.85	1.83	1.92	2.06	1.82	1.69	1.90	1.93	2.11	2.09	1.94	2.04
Cocoa beans	0.20	0.19	0.17	0.23	0.19	0.15	0.18	0.16	0.19	0.21	0.22	0.20	0.21	0.22	0.23
Tobacco (unmanufactured)	0.08	0.08	0.08	0.09	0.12	0.13	0.13	0.15	0.13	0.11	0.12	0.11	0.14	0.15	0.16
Wool (actual weight)	0.13	0.18	0.20	0.19	0.23	0.21	0.19	0.14	0.20	0.21	0.18	0.22	0.18	0.17	0.17
Cotton (lint)	0.52	0.59	0.73	0.61	0.76	1.01	0.98	0.91	1.03	1.05	0.80	0.89	1.17	0.94	0.76
								Thousand metric tons							
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	15.3	23.4	41.4	28.7	30.5	33.7	35.9	24.3	30.6	32.0	40.1	38.9	47.0	49.0	52.0
Dried, salted or smoked fish	—	—	0.3	—	—	1.1	—	1.6	1.6	0.4	0.8	1.0	1.2	0.9	1.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	33.0	39.1	43.6	51.6	59.0	62.1	62.2	64.5	68.5	65.3	70.8	68.1	74.0	77.8	78.0
Fish products and preparations, whether or not in airtight containers	20.6	14.6	18.0	17.0	22.8	20.6	17.8	18.2	14.0	14.1	14.2	9.4	8.5	8.6	12.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	2.7	2.6	3.6	4.1	3.9	4.0	4.7	3.5	5.0	3.4	3.5	3.3	4.4	5.9	5.0
Oils and fats, crude or refined, of aquatic animal origin	33.7	45.0	49.3	79.1	140.8	161.3	154.2	137.6	171.3	114.9	210.3	345.4	178.2	217.2	287.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	94.8	159.2	325.4	554.0	775.5	1 143.7	1 139.4	1 590.6	1 500.3	1 506.6	1 730.1	2 271.1	1 869.0	2 008.7	1 866.0
								Million cubic metres							
FOREST PRODUCTS															
Pulpwood	0.05	0.18	0.24	0.18	0.24	0.34	0.24	0.41	0.34	0.36	0.33	0.36	0.42	0.38	0.35
Broadleaved logs	0.37	0.39	0.28	0.34	0.39	0.40	0.36	0.41	0.54	0.55	0.40	0.39	0.38	0.36	0.37
Sawn softwood	1.75	1.44	1.22	1.26	1.37	1.06	1.05	1.39	1.49	1.66	1.52	1.94	1.60	1.68	1.65
								Million metric tons							
Far East [15]															
AGRICULTURAL PRODUCTS															
Maize	0.19	0.31	0.45	0.71	0.71	0.64	0.89	1.28	0.92	1.37	1.34	1.65	1.71	1.71	1.93
Rice (milled equivalent) [2]	3.98	3.23	3.55	3.82	3.85	3.57	4.25	4.26	4.25	3.39	2.64	1.90	1.96	2.23	2.81
Sugar (raw equivalent) [3]	2.03	2.05	1.79	2.20	2.23	2.18	2.68	2.57	2.54	2.58	1.96	2.00	1.93	2.23	2.76
Pulses (dry)	0.12	0.12	0.15	0.15	0.16	0.16	0.20	0.16	0.22	0.22	0.18	0.17	0.21	0.24	0.28
Vegetable oils and oilseeds (oil equivalent) [5,16]	1.46	1.23	1.16	1.35	1.42	1.33	1.55	1.55	1.39	1.69	1.47	1.75	1.56	1.74	2.10
Oilseed cake and meal	0.46	0.59	0.98	0.88	1.01	1.31	1.54	1.63	1.48	1.45	1.34	1.57	1.28	1.53	1.59
Coffee (green)	0.11	0.08	0.08	0.09	0.16	0.13	0.17	0.15	0.15	0.16	0.25	0.18	0.20	0.21	0.17
Tea	0.43	0.48	0.45	0.44	0.45	0.47	0.48	0.47	0.48	0.44	0.48	0.48	0.43	0.48	0.49
Pepper and pimento	0.09	0.08	0.10	0.08	0.10	0.11	0.11	0.09	0.08	0.10	0.13	0.14	0.12	0.11	0.13
Cotton (lint)	0.17	0.18	0.12	0.14	0.10	0.15	0.22	0.23	0.18	0.12	0.24	0.25	0.15	0.25	0.26
Jute and kenaf	0.80	0.94	0.89	0.83	0.75	0.99	0.89	1.00	1.11	1.19	1.06	0.98	0.83	0.83	0.76
Rubber (natural) [6]	1.83	1.83	2.12	1.85	2.06	2.12	2.09	2.08	2.14	2.04	2.98	2.44	2.75	2.65	2.71

See notes page 179.

ANNEX TABLE 2. – VOLUME OF EXPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
FISHERY PRODUCTS	*Thousand metric tons*														
Fresh, chilled or frozen fish	38.8	40.2	52.6	54.4	54.7	74.9	84.2	99.5	93.3	107.9	214.0	139.6	131.1	137.8	136.0
Dried, salted or smoked fish	66.0	67.0	66.7	55.1	52.3	43.9	40.7	37.6	33.9	46.0	39.8	42.2	42.3	55.6	45.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	25.5	25.3	23.9	26.8	33.3	35.1	39.2	53.8	56.9	58.5	63.8	66.0	81.9	99.5	128.0
Fish products and preparations, whether or not in airtight containers	7.3	7.9	5.4	4.7	7.6	3.5	4.3	5.6	9.0	8.1	5.1	6.9	10.3	11.8	8.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	6.1	7.4	8.6	9.7	9.8	10.2	9.2	9.6	10.7	11.3	12.7	12.6	12.0	11.5	11.0
Oils and fats, crude or refined, of aquatic animal origin	0.6	1.8	2.4	1.7	1.1	0.4	0.1	—	0.4	0.3	0.4	0.9	0.5	0.7	1.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	4.2	2.3	7.0	5.7	8.1	11.9	12.4	14.8	21.9	29.2	25.7	24.2	25.7	27.5	41.0
FOREST PRODUCTS	*Million cubic metres*														
Broadleaved logs	3.99	4.66	6.51	6.91	7.81	8.31	10.73	11.69	13.21	14.40	16.55	20.31	23.99	26.40	28.30
Sawn hardwood	0.82	0.86	0.87	1.17	1.01	0.97	1.26	1.63	1.65	1.54	1.63	2.08	2.34	2.51	2.60
Plywood	0.05	0.10	0.20	0.17	0.24	0.31	0.48	0.72	0.86	1.09	1.15	1.71	1.90	2.13	2.50
Near East [17]	*Million metric tons*														
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	0.42	0.27	0.42	0.08	0.04	0.29	0.23	0.26	0.09	0.10	0.12	0.25	0.07	0.03	0.03
Barley	0.53	0.58	0.26	0.02	0.16	0.76	0.54	0.29	0.47	0.19	0.07	0.15	0.36	0.22	0.02
Rice (milled equivalent) [3]	0.30	0.39	0.05	0.31	0.23	0.14	0.38	0.54	0.37	0.36	0.44	0.58	0.78	0.67	0.53
Potatoes	0.12	0.10	0.18	0.24	0.14	0.24	0.20	0.19	0.18	0.23	0.24	0.21	0.25	0.30	0.27
Pulses (dry)	0.14	0.09	0.10	0.08	0.09	0.18	0.18	0.20	0.31	0.14	0.18	0.12	0.13	0.09	0.12
Citrus fruit [4]	0.10	0.12	0.13	0.16	0.15	0.16	0.18	0.19	0.23	0.23	0.27	0.33	0.41	0.41	0.54
Dates	0.27	0.27	0.31	0.29	0.22	0.26	0.37	0.31	0.30	0.32	0.30	0.28	0.33	0.41	0.42
Oilseed cake and meal	0.24	0.31	0.31	0.29	0.34	0.42	0.49	0.54	0.64	0.67	0.62	0.69	0.69	0.70	0.66
Sheep, lambs and goats [6]	0.23	0.47	0.69	0.71	0.90	1.32	1.25	1.15	1.43	1.26	1.08	1.32	1.16	1.13	1.11
Cotton (lint)	0.55	0.54	0.76	0.72	0.66	0.70	0.84	0.80	0.83	1.00	0.90	0.87	0.86	1.08	1.06
FISHERY PRODUCTS	*Thousand metric tons*														
Fresh, chilled or frozen fish	25.6	10.4	7.6	13.1	10.7	8.9	9.5	10.9	14.7	13.5	9.8	12.6	9.8	8.2	8.0
Dried, salted or smoked fish	7.9	5.5	5.3	8.2	7.7	4.7	6.2	6.7	8.3	9.9	10.0	6.6	7.0	8.2	9.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	0.5	0.4	0.9	1.3	2.8	5.1	4.0	3.5	3.6	2.8	4.6	2.6	5.1	2.8	3.0
Fish products and preparations, whether or not in airtight containers	1.2	2.3	1.1	0.6	0.6	0.6	0.6	0.3	0.4	0.7	0.4	0.3	0.5	1.3	1.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	0.3	0.5	0.8	1.1	0.9	—	—	—	—	0.9	0.5	0.2	0.1	0.4	0.2
Oils and fats, crude or refined, of aquatic animal origin	0.7	—	—	0.1	0.1	0.1	0.1	0.3	0.3	0.1	—	—	0.5	0.1	0.1
Africa [18]	*Million metric tons*														
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent) [19]	0.30	0.38	0.27	0.36	0.13	0.15	0.21	0.19	0.15	0.19	0.08	0.08	0.07	0.13	0.11
Barley	0.10	0.25	0.25	0.16	0.04	—	0.28	0.35	0.02	0.07	0.01	0.01	0.14	0.13	—
Maize	0.37	0.48	0.42	0.30	0.46	0.62	0.43	0.22	0.29	0.25	0.56	0.74	0.52	0.23	0.16
Sugar (raw equivalent) [3]	1.00	0.94	0.87	0.73	0.90	0.98	1.07	1.08	1.20	1.14	1.24	1.35	1.35	1.40	1.18
Bananas	0.40	0.39	0.37	0.38	0.43	0.43	0.45	0.44	0.43	0.38	0.38	0.37	0.38	0.39	0.40
Citrus fruit [4]	0.55	0.51	0.53	0.60	0.61	0.64	0.67	0.75	0.66	0.65	0.69	0.72	0.84	0.63	0.71
Pulses (dry)	0.14	0.16	0.21	0.29	0.21	0.27	0.31	0.36	0.30	0.28	0.26	0.40	0.37	0.43	0.26
Groundnuts and oil (oil equivalent)	0.52	0.67	0.62	0.53	0.67	0.64	0.71	0.71	0.70	0.82	0.75	0.89	0.66	0.55	0.35
Palm kernels and oil (oil equivalent)	0.36	0.40	0.40	0.38	0.36	0.32	0.32	0.33	0.33	0.34	0.24	0.26	0.26	0.29	0.30
Palm oil	0.36	0.37	0.40	0.39	0.36	0.31	0.31	0.31	0.28	0.27	0.18	0.20	0.18	0.22	0.21
Oilseed cake and meal	0.42	0.50	0.53	0.53	0.57	0.52	0.52	0.84	0.67	0.72	0.82	0.85	0.79	0.81	0.76
Cattle [6]	0.19	0.20	0.17	0.25	0.24	0.35	0.37	0.41	0.37	0.36	0.34	0.33	0.35	0.40	0.34
Sheep, lambs and goats [6]	0.73	0.79	1.00	0.85	1.10	1.42	1.29	1.69	1.36	1.64	1.51	1.76	1.24	1.18	2.30
Coffee (green)	0.53	0.54	0.59	0.66	0.67	0.76	0.78	0.85	0.85	0.92	0.91	0.99	0.98	1.00	1.01
Cocoa beans	0.57	0.44	0.56	0.65	0.80	0.86	0.83	0.84	1.08	0.88	0.83	0.82	0.69	0.86	0.91
Wine	1.89	1.50	1.62	1.74	1.60	1.78	1.04	1.29	1.08	1.17	0.72	0.84	1.37	1.45	0.69
Tobacco (unmanufactured)	0.07	0.08	0.09	0.10	0.11	0.11	0.11	0.14	0.16	0.10	0.11	0.10	0.06	0.07	0.08
Cotton (lint)	0.24	0.27	0.29	0.27	0.27	0.28	0.28	0.28	0.28	0.31	0.33	0.31	0.32	0.40	0.36
Sisal	0.32	0.34	0.36	0.37	0.36	0.41	0.40	0.39	0.36	0.34	0.34	0.34	0.31	0.37	0.31
Rubber (natural)	0.12	0.13	0.14	0.15	0.14	0.15	0.15	0.14	0.15	0.16	0.15	0.17	0.18	0.20	0.22

See notes page 179.

ANNEX TABLE 2. – VOLUME OF EXPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*concluded*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	14.6	14.0	15.9	18.0	20.4	36.2	33.5	17.8	17.2	19.2	14.7	19.6	17.1	25.2	32.0
Dried, salted or smoked fish	45.9	49.3	46.5	44.7	50.2	38.3	36.8	33.7	42.3	38.7	37.0	41.5	36.9	38.7	36.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	2.6	1.9	2.5	2.4	2.4	2.9	2.9	3.5	3.8	3.3	4.8	6.2	7.0	9.7	10.0
Fish products and preparations, whether or not in airtight containers	36.9	37.9	45.4	51.9	32.3	59.4	56.3	63.0	37.6	56.7	52.9	62.1	62.4	59.9	60.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	0.2	0.2	0.3	0.5	—	0.8	0.7	0.6	0.5	0.3	0.4	0.5	0.7	—	1.0
Oils and fats, crude or refined, of aquatic animal origin	14.7	13.2	9.0	11.7	7.0	7.6	8.3	12.7	6.5	11.1	13.5	14.8	16.8	16.8	14.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	107.0	98.6	67.1	60.3	70.7	49.6	49.0	77.1	77.2	92.8	63.8	83.8	121.2	87.7	72.0
	Million cubic metres														
FOREST PRODUCTS															
Broadleaved logs	3.00	3.38	3.92	4.60	4.45	4.13	4.80	5.65	5.24	5.14	5.20	6.02	7.44	6.49	6.55
Sawn hardwood	0.45	0.55	0.55	0.59	0.56	0.57	0.57	0.70	0.72	0.75	0.70	0.75	0.74	0.76	0.75

[1] Including exports to the U.S.S.R., eastern Europe and China, but excluding exports from these countries. – [2] Including paddy converted at 65 percent. – [3] Including refined sugar converted at 108.7 percent. – [4] Oranges, mandarines and lemons. – [5] Excluding reexports of copra from Malaysia, but including unrecorded shipments of copra from Indonesia and the Philippines to Malaysia. – [6] Million head. – [7] Beef and veal, mutton and lamb, pork, poultry meat. – [8] Excluding imports into Malaysia for reexports and exports from Hong Kong, but including unrecorded shipments from Indonesia to Malaysia. – [9] Excluding China. – [10] Million cubic metres. – [11] Linseed, sunflowerseed, olive oil, groundnut oil, coconut oil, palm oil, palm-kernel oil, soybean oil, sunflowerseed oil, castor oil, cottonseed oil, linseed oil. – [12] Groundnuts, soybeans, sunflowerseed, linseed, cottonseed, groundnut oil, coconut oil, soybean oil, linseed oil, castor oil, cottonseed oil. – [13] Excluding trade between the United States and its territories. – [14] Groundnuts, copra, palm kernels, soybeans, sunflowerseed, linseed, castor beans, cottonseed, olive oil, groundnut oil, coconut oil, palm oil, palm-kernel oil, sunflowerseed oil, linseed oil, castor oil, cottonseed oil. – [15] Excluding Japan. – [16] Groundnuts, copra, palm kernels, soybeans, cottonseed, groundnut oil, coconut oil, palm oil, palm-kernel oil, soybean oil, cottonseed oil. – [17] Excluding Israel. – [18] Excluding South Africa. – [19] Including coarse ground flour.

ANNEX TABLE 3. – WORLD [1] AVERAGE EXPORT UNIT VALUES OF SELECTED AGRICULTURAL, FISHERY AND FOREST PRODUCTS

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
Agricultural products [2]	*U.S. dollars per metric ton*														
Wheat	63.5	62.5	62.2	61.7	63.3	66.2	64.6	66.1	61.0	63.2	66.2	63.5	64.3	60.1	66.0
Wheat flour	88.7	84.8	79.0	76.9	78.5	81.8	81.5	84.3	84.9	87.1	84.4	83.0	83.0	84.3	89.6
Barley	51.1	51.3	52.7	52.8	47.2	57.6	55.8	56.6	62.5	69.6	67.3	63.9	59.0	52.3	59.8
Maize	55.1	50.6	50.2	50.1	49.2	47.8	52.9	54.7	57.2	57.5	56.1	51.4	55.2	58.3	63.4
Rice (milled)	117.2	122.4	112.9	103.3	109.5	122.0	121.7	124.8	127.5	140.2	163.6	180.5	168.2	137.9	116.5
Sugar (raw)	114.1	99.9	96.0	93.1	95.4	97.3	138.4	138.9	105.4	104.6	103.1	102.8	112.6	119.4	131.0
Apples	136.7	154.3	111.8	138.0	125.7	137.1	146.0	134.9	142.9	158.7	157.3	152.2	160.9	164.3	180.8
Bananas	105.6	98.1	92.3	86.4	90.4	90.2	87.0	89.8	91.9	89.2	92.3	87.3	87.8	88.8	86.6
Oranges and tangerines	133.7	127.0	105.6	110.5	121.1	121.4	137.4	120.7	119.8	129.8	127.2	123.4	130.9	128.1	136.5
Raisins	279.8	326.4	317.1	272.0	282.3	263.3	272.4	335.0	341.4	330.2	324.3	318.9	323.0	325.1	302.6
Dates	56.4	51.6	50.4	62.5	63.7	99.5	83.8	89.8	84.4	90.7	90.6	102.4	88.2	94.7	116.4
Cottonseed	80.8	68.4	67.5	77.8	77.5	68.6	62.1	63.1	68.2	76.1	80.1	72.8	61.3	67.3	76.5
Copra	139.3	163.7	201.9	174.7	141.9	142.2	157.4	165.4	188.4	163.9	160.2	190.5	163.5	173.1	174.2
Palm kernels	121.1	125.7	158.4	157.9	126.8	120.3	136.5	139.0	166.9	148.9	128.1	162.6	140.0	150.9	132.1
Soybeans	91.2	86.8	84.7	83.3	94.4	92.4	99.1	99.4	104.8	113.5	107.2	101.1	97.0	102.5	115.0
Groundnuts (shelled)	204.1	171.8	164.6	182.1	179.5	170.5	168.7	175.6	155.0	187.5	173.4	159.4	192.8	208.9	225.4
Olive oil	668.6	589.3	507.0	511.9	532.9	564.8	803.0	553.6	630.6	638.7	678.6	694.9	643.1	673.5	692.0
Cottonseed oil	337.9	358.0	292.5	244.5	304.6	303.9	266.8	251.9	292.9	295.3	282.7	266.8	257.3	288.5	352.7
Coconut oil	243.5	273.6	342.6	292.5	233.0	221.0	256.4	279.9	305.7	260.0	261.3	323.7	330.6	307.6	281.9
Palm oil	220.8	202.6	206.5	194.1	206.4	194.4	188.6	201.7	237.7	203.8	193.0	145.6	143.0	203.8	220.7
Palm-kernel oil	242.1	252.4	316.8	296.2	230.7	209.4	230.9	232.4	287.6	250.4	226.3	318.1	268.5	299.1	311.0
Soybean oil	338.6	303.6	254.1	233.0	284.5	244.8	239.4	239.1	293.8	299.2	257.0	221.0	229.3	274.0	309.6
Groundnut oil	397.2	361.2	325.8	343.1	344.3	299.9	307.2	322.6	336.5	311.4	317.0	265.4	310.5	336.1	389.2
Cattle [3]	126.7	135.9	145.2	138.2	130.7	120.5	132.1	150.2	151.9	132.7	143.0	138.7	153.6	158.6	180.9
Pigs [3]	43.3	51.2	49.1	47.7	47.1	45.9	53.6	56.5	55.8	67.8	63.8	64.9	71.6	71.3	73.2
Beef and veal	437.1	500.9	573.7	595.3	559.6	529.9	557.0	678.6	771.5	771.8	765.6	791.3	824.4	911.1	1 101.8
Mutton and lamb	460.3	429.1	377.9	401.2	378.1	372.2	414.3	464.2	519.0	492.0	462.7	430.2	461.4	517.4	521.8
Poultry meat	781.6	767.4	682.2	669.2	630.3	650.9	662.4	668.1	693.6	710.5	634.7	644.4	681.6	672.4	669.6
Bacon. ham. salted pork	684.1	712.5	675.0	686.0	661.6	667.0	717.5	782.0	759.7	868.0	818.6	719.8	782.7	834.0	811.5
Canned meat	820.8	848.1	883.5	901.8	937.1	907.4	878.0	924.3	951.2	1 020.2	1 019.6	1 010.2	1 044.7	1 058.0	1 223.7
Milk. condensed and evaporated	330.3	311.2	307.9	308.8	307.4	299.8	306.2	328.1	336.3	333.7	314.4	299.7	305.6	307.6	362.1
Milk. powdered	429.0	375.6	355.1	401.8	363.5	336.5	298.8	305.2	385.9	378.3	382.2	302.4	339.2	334.4	470.8
Butter	783.9	639.6	904.8	829.9	714.3	762.5	826.4	896.0	905.7	818.3	799.8	733.4	723.2	732.2	1 080.2
Cheese	708.5	639.0	739.3	721.8	719.3	701.7	709.6	763.9	841.3	867.0	878.8	874.1	930.4	990.4	1 120.3
Potatoes	51.8	59.4	57.3	56.1	52.3	72.7	62.6	57.0	68.0	75.2	71.2	58.7	70.0	81.9	64.5
Oilseed cake and meal	61.9	55.4	68.7	68.1	63.7	70.4	77.6	76.2	78.8	82.2	82.9	81.8	80.5	84.8	88.8
Coffee	1 025.2	922.8	749.1	723.4	684.2	655.6	646.9	839.8	811.1	774.4	706.9	756.8	724.5	936.4	823.8
Cocoa	562.9	844.0	738.8	593.4	474.3	454.0	486.1	502.4	378.7	402.0	544.4	608.3	772.1	776.1	608.9
Tea	1 191.0	1 170.6	1 144.5	1 168.0	1 144.6	1 102.8	1 110.9	1 089.2	1 050.9	1 004.2	991.7	916.3	855.2	853.9	883.2
Wine	170.3	207.2	176.2	177.6	182.2	173.6	202.3	203.7	212.0	211.8	254.5	259.3	240.1	237.2	290.4
Tobacco (unmanufactured)	1 334.5	1 280.8	1 290.2	1 280.1	1 211.7	1 204.0	1 310.1	1 235.5	1 244.7	1 356.7	1 355.9	1 330.1	1 336.0	1 328.8	1 284.9
Linseed	116.7	125.1	131.6	132.4	127.9	134.6	124.6	121.2	119.7	114.1	120.2	126.9	121.2	112.1	107.4
Linseed oil	245.6	250.7	212.5	246.8	254.1	229.7	200.7	208.2	201.4	189.0	174.2	209.4	213.1	213.9	202.9
Castor beans	182.0	117.4	110.4	134.1	123.9	106.9	111.1	114.3	106.0	106.9	119.9	136.5	125.5	110.7	119.5
Castor oil	279.5	273.0	238.2	282.2	280.1	263.4	249.4	240.9	205.1	238.7	311.7	329.0	251.8	264.2	321.5
Cotton	732.8	673.2	587.0	624.1	641.2	609.6	609.3	603.0	617.1	564.7	558.2	591.2	583.5	602.2	682.4
Jute and kenaf	208.5	193.0	174.8	220.2	291.0	194.7	199.5	161.1	215.6	223.9	225.7	202.6	224.9	215.5	239.2
Sisal	141.8	146.9	174.5	214.8	193.4	197.1	293.2	285.8	190.8	172.5	140.6	125.1	138.2	125.7	122.5
Wool (greasy)	1 598.4	1 132.8	1 083.6	1 162.4	1 143.8	1 138.2	1 324.8	1 445.7	1 175.8	1 223.5	1 174.1	993.2	1 057.3	964.7	804.6
Rubber (natural)	596.5	516.0	659.4	743.0	548.1	524.8	503.5	462.4	445.8	436.6	390.4	346.9	421.8	383.2	315.2
Fishery products [1]															
Fresh, chilled or frozen fish	284.5	293.1	302.4	287.1	301.2	315.1	296.7	289.2	328.9	352.8	323.7	346.0	395.8	418.4	480.0
Dried. salted or smoked fish	296.4	296.5	307.9	328.3	331.1	345.0	361.2	390.9	426.9	455.4	473.8	455.0	470.7	517.9	620.0
Crustacea and molluscs, fresh. frozen, dried. salted, etc.	647.0	670.3	667.4	634.3	684.2	758.1	845.8	796.0	891.6	989.5	1 067.6	1 134.3	1 256.7	1 227.1	1 190.0
Fish products and preparations. whether or not in airtight containers	606.5	646.3	632.3	624.3	600.8	695.1	648.6	639.3	703.0	681.9	726.6	706.0	731.9	765.4	830.0
Crustacean and mollusc products and preparations. whether or not in airtight containers	1 075.5	1 105.6	1 066.6	1 099.5	1 150.5	1 146.4	1 210.8	1 283.1	1 319.2	1 469.2	1 431.3	1 487.1	1 593.2	1 722.0	1 890.0
Oils and fats. crude or refined. of aquatic animal origin	241.6	207.3	191.9	180.1	172.6	133.3	137.3	182.7	194.0	182.2	128.5	93.3	122.3	201.2	210.0
Meals. solubles and similar animal feedstuffs of aquatic origin	136.9	133.3	134.0	92.6	86.8	103.8	107.9	109.9	125.3	144.6	117.8	108.6	129.1	163.4	170.0

See notes page 181.

ANNEX TABLE 3. – WORLD [1] AVERAGE EXPORT UNIT VALUES OF SELECTED AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*concluded*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	U.S. dollars per metric ton														
Forest products [1]															
Fuelwood [4]	8.8	9.2	8.0	8.1	9.4	9.7	9.9	9.7	10.0	10.2	10.0	8.8	9.1	10.0	10.0
Charcoal	22.7	23.1	21.8	22.8	23.3	22.1	22.0	25.0	27.8	26.3	30.0	25.7	21.2	29.3	29.0
Coniferous logs [4]	16.4	17.0	17.5	17.4	17.8	18.1	14.4	15.2	16.7	17.3	18.2	20.1	22.8	24.2	26.0
Broadleaved logs [4]	18.4	18.6	19.0	22.6	22.0	22.6	23.5	22.9	23.3	24.1	24.2	24.2	24.2	25.7	26.0
Pulpwood [4]	12.3	11.6	10.8	10.8	11.9	11.3	10.7	11.0	11.2	10.7	10.8	10.8	10.3	11.4	11.4
Pitprops [4]	14.7	14.0	12.5	11.9	13.0	13.0	13.0	15.1	16.4	17.3	17.6	17.1	17.4	19.7	20.4
Poles, piling, posts [4]	34.2	28.0	25.0	23.9	22.9	24.1	24.8	27.9	29.3	32.1	26.2	26.9	30.7	32.5	32.7
Sawn softwood [4]	39.0	36.8	36.6	36.7	35.9	35.0	35.0	36.6	38.1	38.4	37.0	39.6	44.0	43.9	46.0
Sawn hardwood [4]	60.2	58.7	58.5	59.4	59.0	59.2	63.8	61.3	58.8	60.2	62.8	61.5	65.9	67.7	69.0
Sleepers [4]	39.2	37.1	37.6	36.9	35.1	36.1	39.7	42.5	40.7	40.1	42.1	42.3	37.8	43.5	44.0
Veneer sheets [4]	271.8	263.5	262.4	259.0	253.3	262.2	247.9	237.2	262.0	253.5	260.0	255.6	291.3	312.8	320.0
Plywood [4]	155.6	152.0	156.1	149.5	145.1	150.1	152.9	142.6	139.4	143.4	141.0	145.5	150.4	159.8	163.0
Particle board	143.3	131.1	116.5	108.8	113.9	110.1	108.5	109.2	107.2	107.2	105.3	101.0	106.5	111.5	110.0
Fibreboard	100.3	93.6	91.3	91.1	87.7	88.7	91.8	97.0	104.0	106.1	101.4	99.9	105.0	110.9	112.0
Mechanical wood pulp	77.1	70.5	67.4	66.6	66.1	65.6	64.6	64.9	68.9	68.4	67.5	68.7	69.7	75.6	75.0
Chemical wood pulp	149.6	140.5	134.2	133.4	132.3	125.4	125.0	134.1	136.8	131.6	131.3	127.5	133.7	148.6	149.0
Newsprint	141.1	138.4	140.0	134.8	129.1	127.1	125.8	126.2	124.7	126.3	130.2	132.5	135.6	140.9	143.0
Printing and writing paper	267.2	251.4	236.0	236.8	235.9	229.3	222.9	226.1	226.4	234.9	236.5	237.3	232.9	244.5	246.0

[1] Excluding China and other centrally planned countries in Asia. – [2] Excluding centrally planned countries. – [3] U.S. dollars per thousand head. – [4] U.S. dollars per cubic metre.

ANNEX TABLE 4. – VOLUME OF IMPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons														
Western Europe															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	14.16	12.35	12.89	11.17	15.13	13.32	12.05	10.56	12.39	12.42	10.45	10.94	13.58	13.51	13.13
Barley	4.61	4.69	4.77	4.27	4.19	4.72	3.63	4.51	4.84	5.02	4.96	4.10	4.62	6.41	6.67
Maize	4.78	6.32	7.66	8.93	9.43	12.91	13.87	14.48	16.95	18.69	19.38	18.76	16.63	17.48	18.97
Oats	0.98	1.32	1.41	1.24	0.86	1.32	1.07	0.97	1.32	1.28	1.05	1.02	0.96	1.23	1.21
Rye	0.77	0.56	0.59	0.76	0.75	1.02	0.74	0.46	0.36	0.41	0.41	0.27	0.24	0.22	0.28
Millet and sorghums	0.68	1.88	2.72	2.51	1.77	2.88	2.03	2.18	2.74	3.20	2.43	1.49	0.84	1.36	1.83
Rice (milled equivalent) [1]	0.48	0.51	0.60	0.59	0.51	0.53	0.52	0.54	0.55	0.62	0.50	0.60	0.62	0.59	0.69
Sugar (raw equivalent) [2]	5.38	4.86	4.62	4.63	3.99	4.22	5.32	4.97	4.54	4.97	4.84	4.67	4.42	4.50	4.53
Potatoes	1.05	1.81	1.86	1.45	1.48	1.97	1.72	1.54	2.39	2.06	1.95	1.85	2.36	2.32	2.01
Pulses (dry)	0.47	0.50	0.62	0.61	0.45	0.61	0.68	0.66	1.03	1.00	0.81	0.97	1.16	0.94	0.88
Apples	0.94	0.68	0.99	0.95	1.11	1.23	0.96	1.13	1.36	1.28	1.24	1.30	1.34	1.27	1.42
Bananas	1.44	1.59	1.63	1.68	1.85	1.90	1.93	1.97	2.35	2.58	2.62	2.54	2.59	2.49	2.74
Citrus fruit [3]	2.22	2.36	2.55	2.76	2.71	2.98	2.71	3.30	3.21	3.31	3.19	3.14	3.43	3.61	3.42
Grapes (fresh)	0.24	0.33	0.30	0.32	0.37	0.43	0.37	0.44	0.50	0.48	0.49	0.48	0.51	0.51	0.55
Vegetable oils and oilseeds (oil equivalent) [4]	3.60	3.30	3.43	3.74	3.62	3.61	3.90	3.85	3.90	4.20	4.19	4.32	4.50	4.87	5.24
Oilseed cake and meal	2.95	3.69	4.42	4.44	4.60	5.67	5.91	6.17	7.00	7.99	7.48	7.44	8.15	9.11	9.66
Cattle [5]	1.60	1.41	1.32	1.49	1.83	1.49	2.02	1.94	2.03	2.03	2.56	2.99	3.33	3.29	3.49
Sheep, lambs and goats [5]	0.78	0.68	0.87	1.10	0.88	1.35	1.32	1.37	1.93	1.74	1.74	2.16	2.53	2.67	2.72
Pigs [5]	0.40	0.76	1.16	1.29	1.04	0.96	0.74	0.91	1.24	1.25	1.14	1.30	1.83	2.13	2.37
Meat (fresh, chilled and frozen) [6]	1.25	1.21	1.23	1.36	1.27	1.44	1.72	1.81	1.89	1.82	2.06	2.04	2.29	2.27	2.37
Butter	0.45	0.46	0.47	0.48	0.47	0.49	0.51	0.56	0.52	0.52	0.54	0.54	0.53	0.59	0.56
Cheese	0.31	0.33	0.34	0.34	0.36	0.39	0.42	0.43	0.46	0.47	0.48	0.50	0.50	0.54	0.59
Coffee (green)	0.75	0.79	0.87	0.93	0.99	1.04	1.12	1.19	1.18	1.24	1.28	1.39	1.47	1.50	1.52
Cocoa beans	0.45	0.39	0.43	0.47	0.52	0.56	0.56	0.54	0.59	0.60	0.55	0.54	0.55	0.53	0.55
Tea	0.31	0.30	0.27	0.28	0.29	0.29	0.30	0.29	0.30	0.28	0.32	0.34	0.28	0.32	0.31
Wine	2.53	2.64	2.18	2.45	2.39	2.55	1.95	2.10	1.92	2.16	1.62	1.68	1.97	2.30	2.20
Tobacco (unmanufactured)	0.41	0.41	0.40	0.47	0.48	0.52	0.52	0.54	0.53	0.52	0.56	0.54	0.57	0.58	0.63
Wool (actual weight)	0.89	0.77	0.89	0.83	0.86	0.88	0.86	0.81	0.80	0.80	0 73	0.79	0.83	0.82	0.76
Cotton (lint)	1.72	1.43	1.44	1.70	1.59	1.46	1.47	1.54	1.39	1.57	1.47	1.41	1.44	1.35	1.27
Sisal	0.30	0.32	0.34	0.36	0.36	0.39	0.40	0.37	0.38	0.39	0.34	0.37	0.36	0.34	0.33
Rubber (natural)	0.71	0.62	0.64	0.64	0.64	0.66	0.70	0.75	0.76	0.76	0.76	0.81	0.91	0.92	0.92
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	381.6	417.8	461.0	552.8	598.9	648.8	727.2	747.3	820.9	792.5	816.9	869.7	814.3	885.3	952.0
Dried, salted or smoked fish	195.1	199.3	185.6	188.1	207.8	203.2	200.6	188.9	196.9	202.3	211.8	198.0	195.8	212.0	222.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	73.7	84.8	102.0	187.8	104.4	117.3	109.0	136.8	138.1	132.0	143.0	151.0	161.0	176.0	188.0
Fish products and preparations, whether or not in airtight containers	174.8	204.7	234.9	221.9	219.0	261.8	254.3	269.4	272.8	256.6	255.4	268.4	252.0	257.0	252.0
Crustacean and molluse products and preparations, whether or not in airtight containers	10.1	9.9	11.5	13.9	13.4	17.6	21.8	28.1	31.6	34.0	32.0	35.0	32.0	44.0	43.0
Oils and fats, crude or refined, of aquatic animal origin	491.4	471.8	499.7	580.2	570.7	596.0	640.9	593.6	623.9	568.3	7 2.0	767.0	713.0	656.0	628.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	457.8	494.2	581.4	760.4	960.2	1 165.6	1 195.5	1 496.2	1 564.7	1 469.5	1 723.3	2 000.0	2 089.0	1843.0	1 826.0
	Million metric tons														
FOREST PRODUCTS															
Pulpwood [7]	4.90	4.27	4.84	6.66	8.55	7.47	6.92	8.78	9.42	8.99	9.14	9.78	11.00	14.53	12.10
Coniferous logs [7]	1.21	1.46	1.62	2.17	2.28	2.25	2.44	2.23	2.25	2.52	2.51	2.53	2.38	2.56	2.30
Broadleaved logs [7]	3.55	3.79	4.51	5.76	5.78	5.51	6.08	6.76	6.21	6.41	6.30	7.00	8.34	7.75	8.00
Pitprops [7]	3.01	2.50	1.81	1.76	1.82	1.44	1.30	1.34	1.16	0.87	0.44	0.40	0.54	0.60	0.41
Sawn softwood [7]	16.00	15.01	16.87	20.08	19.62	20.22	21.68	24.25	23.57	21.85	22.09	23.66	23.88	24.38	23.80
Sawn hardwood [7]	1.62	1.57	1.68	2.04	2.03	1.91	2.20	2.48	2.60	2.67	2.65	3.10	3.36	3.55	3.45
Plywood and veneers [7]	0.64	0.64	0.74	0.96	0.90	0.98	1.10	1.33	1.40	1.38	1.65	1.88	1.99	2.23	2.22
Fibreboard	0.39	0.39	0.44	0.50	0.52	0.59	0.65	0.75	0.69	0.65	0.74	0.77	0.78	0.80	0.80
Mechanical wood pulp	1.02	0.92	0.95	1.11	1.06	0.97	1.04	1.16	1.21	1.14	1.00	1.07	1.08	1.07	0.76
Chemical wood pulp	3.73	3.73	4.08	4.99	4.89	4.97	5.80	6.23	6.04	6.57	6.69	7.46	8.22	8.79	7.15
Newsprint	1.09	1.14	1.09	1.34	1.43	1.49	1.56	1.69	1.70	1.84	1.72	1.90	2.29	2.41	2.30
Other paper and paperboard	1.77	1.81	2.11	2.60	2.98	3.24	3.72	4.30	4.65	5.02	5.24	6.14	7.11	7.43	7.76

See notes page 186.

ANNEX TABLE 4. – VOLUME OF IMPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Million metric tons														
Eastern Europe and U.S.S.R.															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	5.13	3.66	5.09	5.57	5.46	4.18	8.21	15.09	10.80	12.58	6.17	5.85	4.91	6.73	...
Barley	1.10	0.61	0.49	0.43	0.69	0.67	0.89	1.17	1.93	0.44	0.81	0.97	0.84	2.16	...
Maize	0.15	0.69	0.39	0.64	0.61	1.32	0.96	1.20	1.22	1.08	1.09	1.35	1.37	1.09	...
Rye	0.40	0.49	0.39	0.54	0.76	0.87	0.78	0.15	0.06	0.23	0.28	0.22	0.26	0.18	...
Rice (milled equivalent) [1]	0.62	0.76	1.10	0.93	0.24	0.55	0.50	0.63	0.50	0.53	0.65	0.51	0.56	0.54	...
Sugar (raw equivalent) [2]	0.76	0.49	0.46	2.03	4.22	3.42	1.91	2.18	2.96	2.53	3.23	2.67	2.12	4.30	...
Citrus fruit [3]	0.20	0.25	0.26	0.23	0.24	0.27	0.27	0.37	0.45	0.54	0.59	0.62	0.69	0.70	...
Vegetable oils and oilseeds (oil equivalent) [4]	0.40	0.33	0.39	0.38	0.39	0.37	0.40	0.48	0.44	0.49	0.47	0.50	0.45	0.46	...
Sheep, lambs and goats [5]	1.52	1.66	1.58	1.74	1.76	1.38	1.25	1.15	1.41	1.93	1.67	1.09	0.95	1.00	...
Meat (fresh, chilled and frozen) [6]	0.16	0.22	0.25	0.21	0.17	0.26	0.22	0.25	0.34	0.29	0.27	0.24	0.20	0.43	...
Coffee (green)	0.03	0.03	0.06	0.06	0.08	0.07	0.09	0.10	0.11	0.12	0.12	0.14	0.17	0.18	...
Cocoa beans	0.07	0.04	0.08	0.10	0.07	0.10	0.11	0.13	0.16	0.12	0.16	0.19	0.17	0.18	...
Wine	0.11	0.13	0.12	0.18	0.19	0.18	0.22	0.25	0.26	0.31	0.41	0.48	0.90	0.99	...
Tobacco (unmanufactured)	0.15	0.14	0.16	0.13	0.12	0.13	0.16	0.20	0.17	0.13	0.13	0.13	0.11	0.12	...
Cotton (lint)	0.50	0.54	0.62	0.67	0.66	0.66	0.71	0.68	0.71	0.74	0.68	0.70	0.70	0.86	...
Rubber (natural)	0.21	0.34	0.35	0.34	0.52	0.48	0.45	0.35	0.43	0.48	0.44	0.50	0.48	0.52	...
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	186.2	190.2	182.5	201.7	130.8	153.4	153.7	146.1	145.6	159.4	138.4	126.0	119.8	132.0	96.0
Dried, salted or smoked fish	114.4	106.1	104.7	76.1	43.9	51.6	56.4	45.8	26.8	19.7	20.9	24.0	17.0	10.0	30.0
Fish products and preparations, whether or not in airtight containers	16.5	19.8	28.8	31.8	28.9	31.1	26.0	27.6	23.8	21.4	26.4	38.0	31.0	27.5	31.0
Oils and fats, crude or refined, of aquatic animal origin	46.2	41.3	49.2	35.7	49.1	61.4	84.9	75.2	65.4	52.7	31.0	21.0	24.0	22.0	19.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	16.5	18.4	28.0	32.1	55.2	86.4	163.0	197.7	292.3	292.5	314.7	366.0	344.0	403.0	423.0
	Million metric tons														
FOREST PRODUCTS															
Sawn softwood [7]	1.97	1.81	1.79	1.92	2.05	2.32	2.32	2.41	2.66	2.55	2.65	2.86	2.79	3.06	3.30
Sawn hardwood [7]	0.27	0.31	0.31	0.38	0.38	0.40	0.36	0.43	0.43	0.44	0.48	0.46	0.44	0.44	0.44
Pulp and pulp products	0.55	0.56	0.55	0.61	0.72	0.77	0.79	0.95	1.15	1.22	1.53	1.72	1.93	2.33	2.37
North America															
AGRICULTURAL PRODUCTS															
Maize	0.28	0.38	0.34	0.41	0.61	0.92	0.61	0.55	0.49	0.54	0.76	0.81	0.69	0.55	0.25
Sugar (raw equivalent) [2,9]	4.43	5.01	4.86	4.93	4.55	4.98	4.84	4.06	4.34	4.64	5.16	5.41	5.28	5.72	5.73
Bananas	1.70	1.76	1.91	2.02	1.94	1.72	1.73	1.71	1.75	1.89	1.91	1.98	1.93	2.05	2.13
Citrus fruit [8]	0.21	0.20	0.24	0.22	0.20	0.20	0.22	0.25	0.23	0.23	0.24	0.26	0.26	0.26	0.26
Vegetable oils and oilseeds (oil equivalent) [8]	0.53	0.54	0.58	0.59	0.60	0.63	0.59	0.63	0.65	0.72	0.75	0.74	0.76	0.77	0.80
Cattle [6]	0.73	1.16	0.74	0.67	1.05	1.25	0.86	0.58	1.13	1.11	0.78	1.05	1.05	1.22	1.08
Meat (fresh, chilled and frozen) [6]	0.09	0.22	0.31	0.27	0.35	0.49	0.58	0.41	0.35	0.44	0.48	0.55	0.63	0.69	0.65
Coffee (green)	1.30	1.26	1.45	1.38	1.41	1.54	1.51	1.44	1.35	1.39	1.36	1.61	1.30	1.26	1.38
Cocoa beans	0.25	0.21	0.23	0.27	0.37	0.31	0.30	0.29	0.38	0.34	0.30	0.25	0.24	0.30	0.34
Wool (actual weight)	0.13	0.12	0.19	0.15	0.16	0.17	0.17	0.11	0.13	0.13	0.09	0.12	0.09	0.07	0.06
Rubber (natural)	0.61	0.52	0.63	0.45	0.43	0.47	0.42	0.50	0.50	0.49	0.51	0.60	0.62	0.62	0.68

See notes page 186.

ANNEX TABLE 4. – VOLUME OF IMPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
FISHERY PRODUCTS	*Thousand metric tons*														
Fresh, chilled or frozen fish	236.6	269.5	308.5	296.7	282.9	348.4	322.1	340.2	361.1	432.7	394.3	502.7	494.4	536.7	532.0
Dried, salted or smoked fish	40.5	51.9	41.9	41.5	39.8	37.7	36.5	36.0	35.8	38.4	32.8	33.2	30.3	38.2	34.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	61.7	66.3	78.4	84.8	91.6	99.7	110.7	100.6	104.8	113.5	114.2	122.4	128.2	137.5	129.0
Fish products and preparations, whether or not in airtight containers	70.4	80.7	78.7	64.6	69.6	72.5	63.1	68.2	67.7	88.9	82.4	88.4	83.9	102.4	87.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	9.9	11.8	14.4	13.3	13.1	14.3	15.5	22.3	23.2	21.5	24.9	26.2	26.3	27.2	24.0
Oils and fats, crude or refined, of aquatic animal origin	29.8	45.6	25.9	31.5	50.8	59.6	49.8	35.7	43.3	38.5	31.3	32.0	26.5	31.0	28.0
Meals, solubles, and similar animal feedstuffs of aquatic animal origin	83.2	105.4	146.1	124.5	210.2	234.7	350.6	406.9	250.3	410.1	595.3	779.9	325.8	229.2	257.0
FOREST PRODUCTS	*Million metric tons*														
Pulpwood [7]	4.18	3.31	3.05	3.42	3.43	3.39	3.08	1.85	1.83	1.98	1.86	1.65	1.64	1.37	1.00
Coniferous logs [7]	0.74	0.64	0.75	0.90	0.97	1.21	1.23	1.20	1.56	1.24	1.30	1.58	1.50	1.79	1.35
Broadleaved logs [7]	0.41	0.33	0.33	0.36	0.22	0.28	0.24	0.51	0.50	0.53	0.59	0.53	0.47	0.48	0.51
Sawn softwood [7]	6.79	7.87	9.32	8.97	9.86	11.15	12.11	11.73	11.73	11.39	11.69	13.98	14.06	13.86	17.38
Sawn hardwood [7]	0.81	0.83	1.09	0.94	0.83	0.97	0.97	1.00	1.08	1.26	1.20	1.09	1.36	1.01	1.12
Plywood [7]	0.46	0.55	0.90	0.66	0.73	0.96	1.07	1.31	1.42	1.64	1.66	2.29	2.53	2.35	2.98
Chemical wood pulp	1.76	1.78	2.06	1.98	2.01	2.34	2.28	2.42	2.60	2.80	2.64	2.99	3.43	3.07	3.08
Newsprint	4.74	4.43	4.77	4.91	4.96	4.97	4.91	5.40	5.74	6.34	5.99	5.86	6.16	6.02	6.20
Other paper and paperboard	0.24	0.26	0.29	0.26	0.29	0.30	0.28	0.31	0.33	0.42	0.41	0.43	0.48	0.54	0.62
Oceania															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	0.34	0.32	0.27	0.22	0.23	0.26	0.26	0.27	0.24	0.19	0.15	0.11	0.09	0.12	0.13
Sugar (raw equivalent) [2]	0.11	0.15	0.12	0.13	0.16	0.14	0.15	0.13	0.16	0.16	0.17	0.18	0.20	0.17	0.20
Rubber (natural)	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.06	0.05	0.05	0.06	0.06	0.06	0.05
FISHERY PRODUCTS	*Thousand metric tons*														
Fresh, chilled or frozen fish	9.3	10.7	11.3	16.3	15.8	14.4	5.1	19.1	21.0	28.0	27.0	27.0	33.0	34.0	40.0
Dried, salted or smoked fish	2.3	5.5	3.6	4.3	4.0	5.0	5.0	4.9	4.0	5.0	3.0	4.0	5.0	4.0	4.6
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	—	—	—	—	—	0.5	0.5	1.0	1.2	1.0	1.0	1.0	1.0	1.0	1.5
Fish products and preparations, whether or not in airtight containers	14.7	14.3	14.2	18.0	24.7	19.1	18.8	27.4	24.5	25.1	27.0	27.0	28.0	29.0	29.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	0.2	0.4	0.3	0.2	0.6	0.3	0.3	0.6	0.7	2.0	2.0	2.0	2.0	3.0	2.6
Oils and fats, crude or refined, of aquatic animal origin	2.4	2.3	2.3	2.7	3.5	3.3	2.9	3.9	7.3	8.0	4.0	5.0	7.0	4.0	5.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	0.5	1.5	4.0	6.0	9.4	6.2	5.7	8.5	11.0	11.0	14.0	28.0	30.0	27.0	32.0
FOREST PRODUCTS	*Million metric tons*														
Sawn softwood [7]	0.65	0.60	0.56	0.70	0.71	0.60	0.58	0.73	0.69	0.72	0.70	0.69	0.77	0.71	0.68
Newsprint	0.21	0.31	0.22	0.25	0.30	0.20	0.22	0.26	0.29	0.28	0.28	0.30	0.30	0.28	0.24
Other paper and paperboard	0.11	0.12	0.12	0.15	0.20	0.15	0.17	0.17	0.19	0.17	0.19	0.20	0.22	0.26	0.26
Latin America															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	3.25	3.40	3.95	4.20	4.24	4.88	5.16	5.99	5.57	6.70	6.86	7.09	6.98	6.19	5.93
Maize	0.86	0.96	0.16	0.21	0.22	0.39	0.67	0.67	0.40	0.41	0.37	0.58	0.66	1.42	0.83
Rice (milled equivalent) [1]	0.32	0.40	0.34	0.35	0.35	0.31	0.34	0.50	0.55	0.45	0.37	0.40	0.41	0.36	0.39
Sugar (raw equivalent) [2]	0.49	0.37	0.39	0.24	0.50	0.23	0.27	0.21	0.27	0.31	0.25	0.17	0.38	0.16	0.19
Bananas	0.21	0.27	0.25	0.27	0.27	0.24	0.24	0.24	0.25	0.26	0.23	0.24	0.26	0.28	0.27
Pulses (dry)	0.13	0.17	0.17	0.14	0.17	0.13	0.16	0.19	0.16	0.19	0.21	0.21	0.20	0.19	0.21
Cattle [5]	0.26	0.24	0.21	0.30	0.35	0.39	0.42	0.29	0.27	0.32	0.36	0.28	0.30	0.27	0.20
Sheep, lambs and goats [5]	0.04	0.05	0.05	0.08	0.09	0.11	0.28	0.14	0.07	0.09	0.11	0.13	0.12	0.13	0.14
Milk (condensed, evaporated and powdered)	0.15	0.15	0.17	0.14	0.18	0.20	0.23	0.24	0.24	0.23	0.26	0.28	0.27	0.27	0.28
Rubber (natural)	0.09	0.10	0.08	0.09	0.09	0.08	0.08	0.09	0.08	0.09	0.08	0.10	0.10	0.10	0.11

See notes page 186.

ANNEX TABLE 4. – VOLUME OF IMPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*continued*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	0.5	0.7	0.5	2.7	2.3	3.1	16.4	16.4	20.0	16.3	22.7	28.3	31.0	23.5	37.0
Dried, salted or smoked fish	82.5	61.0	63.4	67.9	65.5	68.5	78.2	81.1	59.6	81.6	90.2	90.8	102.0	104.0	94.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	0.5	0.5	0.6	0.5	0.5	0.8	0.9	1.0	1.4	3.5	4.8	6.5	8.0	8.5	9.0
Fish products and preparations, whether or not in airtight containers	20.2	18.4	21.3	20.3	16.3	21.8	20.7	25.9	22.8	28.1	24.6	22.6	21.0	20.0	24.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	0.8	0.9	0.9	1.1	0.5	0.5	0.5	0.6	1.4	1.5	1.1	0.8	0.7	0.1	1.0
Oils and fats, crude or refined, of aquatic animal origin	3.6	1.9	3.0	4.0	10.3	2.3	7.5	13.5	18.3	32.5	19.7	37.3	41.5	43.0	42.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	4.9	6.4	15.0	32.1	31.0	48.5	53.8	72.7	77.1	91.9	104.7	137.1	134.2	132.0	153.0
	Million metric tons														
FOREST PRODUCTS															
Broadleaved logs [7]	0.32	0.34	0.24	0.27	0.28	0.23	0.22	0.25	0.37	0.35	0.31	0.23	0.26	0.27	0.27
Sawn softwood [7]	1.62	1.42	1.08	1.05	1.32	1.09	0.99	1.23	1.43	1.51	1.36	1.60	1.59	1.56	1.60
Chemical wood pulp	0.40	0.35	0.37	0.33	0.42	0.35	0.37	0.45	0.46	0.52	0.46	0.59	0.59	0.65	0.70
Newsprint	0.55	0.54	0.52	0.60	0.64	0.58	0.54	0.56	0.63	0.66	0.67	0.76	0.85	0.84	0.80
Other paper and paperboard	0.36	0.36	0.31	0.30	0.31	0.28	0.29	0.41	0.43	0.58	0.63	0.70	0.72	0.91	1.00
Far East [10]															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	5.23	5.49	5.94	7.52	6.12	5.86	8.19	9.67	10.81	11.42	12.19	10.35	8.69	9.84	8.48
Barley	0.27	0.36	0.02	0.02	0.18	0.11	0.22	0.21	0.12	0.01	0.04	0.21	0.22	0.28	0.30
Maize	0.17	0.15	0.24	0.29	0.37	0.47	0.46	0.32	0.39	0.34	0.69	0.71	1.03	1.34	1.24
Millet and sorghums	0.01	0.09	0.05	0.02	0.02	0.03	0.02	0.02	0.07	1.59	2.17	0.44	0.42	0.05	0.07
Rice (milled equivalent) [1]	3.70	3.35	2.90	3.72	3.62	3.36	3.93	4.00	3.50	3.62	3.80	3.60	3.42	4.35	4.10
Sugar (raw equivalent) [2]	0.79	0.91	0.74	0.83	0.92	1.01	0.90	0.91	1.07	1.24	1.24	1.76	1.63	1.41	1.43
Dates	0.07	0.07	0.07	0.07	0.07	0.04	0.07	0.04	0.07	0.07	0.09	0.07	0.08	0.11	0.12
Vegetable oils and oilseeds (oil equivalent) [8]	0.34	0.30	0.31	0.34	0.33	0.38	0.39	0.50	0.35	0.37	0.48	0.43	0.56	0.68	0.75
Milk (condensed, evaporated and powdered)	0.39	0.33	0.34	0.34	0.38	0.40	0.43	0.41	0.39	0.41	0.36	0.42	0.45	0.41	0.44
Cotton (lint)	0.30	0.24	0.29	0.45	0.47	0.45	0.43	0.46	0.48	0.49	0.57	0.64	0.54	0.67	0.75
Jute and kenaf	0.13	0.10	0.07	0.16	0.11	0.10	0.07	0.09	0.14	0.10	0.03	0.05	0.03	0.01	0.01
Rubber (natural) [11]	0.04	0.04	0.04	0.05	0.06	0.07	0.06	0.07	0.06	0.06	0.08	0.06	0.09	0.02	0.07
	Thousand metric tons														
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	67.5	71.7	77.1	81.4	76.0	89.1	97.8	107.7	109.4	115.6	113.9	110.9	102.0	101.8	133.0
Dried, salted or smoked fish	105.9	102.0	101.1	102.7	80.1	57.5	64.4	62.0	55.8	72.0	57.8	62.7	60.9	61.1	61.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	32.7	36.6	35.0	39.4	36.3	34.2	43.3	42.0	39.5	42.5	40.3	36.6	35.9	43.9	52.0
Fish products and preparations, whether or not in airtight containers	74.2	90.6	69.9	107.8	96.6	62.9	67.8	67.1	64.2	73.8	82.4	92.9	106.6	105.5	110.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	15.2	15.6	18.0	21.5	17.9	17.9	20.1	17.2	17.1	12.6	21.8	23.9	22.6	20.8	16.0
Oils and fats, crude or refined, of aquatic animal origin	0.8	0.6	1.2	2.0	1.6	1.9	1.8	1.6	1.6	2.1	5.2	5.9	6.9	7.9	7.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	21.0	21.7	34.2	31.9	44.8	44.3	42.7	49.2	52.8	55.8	70.9	86.2	112.0	117.6	115.0
	Million metric tons														
FOREST PRODUCTS															
Coniferous logs [7]	0.08	0.04	0.04	0.02	0.01	0.11	0.19	0.23	0.14	0.25	0.31	0.48	0.23	0.29	0.35
Broadleaved logs [7]	0.66	0.58	0.71	0.90	0.92	1.31	1.39	2.31	2.77	3.74	4.05	5.59	5.65	6.67	7.50
Sawn softwood [7]	0.17	0.30	0.41	0.21	0.16	0.16	0.16	0.19	0.15	0.13	0.17	0.08	0.08	0.08	0.08
Sawn hardwood [7]	0.12	0.08	0.10	0.09	0.09	0.12	0.12	0.35	0.30	0.37	0.40	0.65	0.48	0.53	0.58
Chemical wood pulp	0.05	0.07	0.13	0.14	0.19	0.24	0.26	0.23	0.21	0.25	0.24	0.31	0.36	0.34	0.35
Newsprint	0.21	0.19	0.22	0.23	0.29	0.24	0.26	0.26	0.27	0.34	0.32	0.42	0.46	0.47	0.47
Other paper and paperboard	0.35	0.29	0.33	0.37	0.39	0.37	0.41	0.49	0.46	0.56	0.62	0.67	0.92	0.99	1.06

See notes page 186.

ANNEX TABLE 4. – VOLUME OF IMPORTS OF MAJOR AGRICULTURAL, FISHERY AND FOREST PRODUCTS (*concluded*)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971 (Preliminary)
							Million metric tons								
Near East [12]															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	2.18	2.01	2.61	3.70	3.91	3.47	4.14	3.30	4.47	4.33	4.59	4.56	3.27	4.51	6.14
Maize	0.11	0.07	0.14	0.09	0.15	0.31	0.26	0.50	0.22	0.29	0.30	0.33	0.20	0.26	0.31
Rice (milled equivalent) [1]	0.25	0.19	0.35	0.35	0.41	0.34	0.25	0.35	0.35	0.34	0.37	0.38	0.37	0.49	0.52
Sugar (raw equivalent) [2]	0.88	0.97	1.04	1.10	1.46	1.07	0.85	1.23	1.74	1.41	1.29	1.03	0.86	0.97	1.04
Dates	0.08	0.11	0.06	0.05	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.04	0.05	0.07	0.08
Vegetable oils and oilseeds (oil equivalent) [3]	0.09	0.11	0.14	0.13	0.10	0.23	0.26	0.26	0.18	0.19	0.23	0.21	0.26	0.35	0.32
Sheep, lambs and goats [4]	0.94	1.13	1.62	1.23	1.53	2.37	2.30	2.84	2.71	3.07	2.53	3.84	3.30	2.85	3.68
							Thousand metric tons								
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	1.8	3.0	4.5	4.9	5.6	6.5	6.9	8.5	13.7	23.8	21.5	13.6	9.0	9.2	11.0
Dried, salted or smoked fish	6.4	5.2	5.4	4.4	4.0	2.8	2.1	2.9	2.9	8.8	2.8	3.6	2.4	2.2	2.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.4	0.4	0.3	0.4	0.4
Fish products and preparations, whether or not in airtight containers	12.6	6.3	10.1	9.0	10.1	10.9	9.1	9.0	6.9	5.5	7.7	8.6	8.4	10.1	9.0
Oils and fats, crude or refined, of aquatic animal origin	1.8	2.6	2.7	0.5	0.8	0.7	0.6	0.4	0.8	0.9	0.5	0.3	0.9	0.7	1.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	—	—	0.1	—	—	—	—	—	—	2.5	5.2	4.5	7.8	3.9	5.0
							Million metric tons								
FOREST PRODUCTS															
Sawn softwood [7]	0.58	0.55	0.55	0.81	0.83	0.83	0.84	1.02	1.06	1.24	1.05	0.90	1.00	1.26	1.30
All paper and paperboard	0.18	0.20	0.20	0.24	0.27	0.28	0.28	0.27	0.31	0.37	0.46	0.46	0.51	0.53	0.54
Africa [13]															
AGRICULTURAL PRODUCTS															
Wheat and wheat flour (wheat equivalent)	0.94	0.79	1.29	1.57	1.91	1.89	1.47	1.09	1.71	2.06	2.97	2.74	2.05	2.84	2.82
Barley	0.02	—	—	0.01	0.37	0.24	0.06	0.07	0.08	0.09	0.12	0.05	0.07	0.02	0.05
Rice (milled equivalent) [1]	0.42	0.34	0.49	0.45	0.47	0.56	0.49	0.60	0.65	0.70	0.58	0.59	0.60	0.72	0.83
Sugar (raw equivalent) [2]	1.00	1.01	1.08	1.12	1.10	1.22	0.98	1.03	1.14	1.20	1.25	1.15	1.00	1.27	1.17
Potatoes	0.27	0.29	0.26	0.31	0.34	0.24	0.20	0.19	0.16	0.16	0.12	0.16	0.15	0.15	0.16
Cattle [5]	0.21	0.22	0.23	0.27	0.29	0.27	0.30	0.25	0.21	0.26	0.25	0.22	0.25	0.30	0.31
Sheep, lambs and goats [6]	0.28	0.25	0.33	0.38	0.25	0.40	0.60	0.40	0.19	0.24	0.24	0.26	0.28	0.34	0.37
Wine	0.25	0.20	0.22	0.26	0.30	0.22	0.22	0.22	0.26	0.27	0.25	0.26	0.24	0.22	0.23
							Thousand metric tons								
FISHERY PRODUCTS															
Fresh, chilled or frozen fish	25.2	28.2	29.8	37.3	55.0	55.7	72.8	62.8	65.9	81.6	58.1	56.8	67.2	81.6	96.0
Dried, salted or smoked fish	100.2	94.6	95.7	99.5	99.7	97.0	101.0	91.8	85.8	97.3	85.9	71.6	69.1	71.4	70.0
Crustacea and molluscs, fresh, frozen, dried, salted, etc.	3.4	3.4	3.3	4.1	3.9	1.9	1.2	2.1	0.7	0.8	0.7	0.6	1.5	2.0	2.0
Fish products and preparations, whether or not in airtight containers	35.4	31.9	38.1	40.2	39.5	31.3	31.1	29.6	33.8	32.8	26.7	29.9	30.8	37.2	31.0
Crustacean and mollusc products and preparations, whether or not in airtight containers	0.3	0.3	0.2	0.3	0.1	0.1	—	0.1	0.1	—	0.8	0.8	0.7	0.6	1.0
Oils and fats, crude or refined, of aquatic animal origin	0.2	0.4	0.5	0.7	1.0	1.9	1.7	2.3	1.7	0.8	0.8	1.7	3.6	4.0	4.0
Meals, solubles and similar animal feedstuffs of aquatic animal origin	6.8	6.6	6.6	6.0	7.9	7.6	8.7	6.2	9.4	10.1	11.5	11.0	15.0	15.0	15.0
							Million metric tons								
FOREST PRODUCTS															
Sawn softwood [7]	0.53	0.63	0.64	0.71	0.50	0.44	0.44	0.55	0.48	0.54	0.57	0.63	0.71	0.93	1.00
Sawn hardwood [7]	0.16	0.15	0.14	0.15	0.12	0.12	0.13	0.12	0.17	0.19	0.17	0.18	0.18	0.19	0.21
Newsprint	0.03	0.03	0.04	0.05	0.05	0.05	0.05	0.03	0.04	0.05	0.04	0.03	0.03	0.04	0.04
Other paper and paperboard	0.12	0.14	0.12	0.14	0.15	0.15	0.18	0.19	0.23	0.24	0.26	0.28	0.33	0.36	0.39

[1] Including paddy converted at 65 percent. – [2] Including refined sugar converted at 108.7 percent. – [3] Oranges, mandarines and lemons. – [4] Groundnuts, copra, palm kernels, soybeans, sunflowerseed, castor beans, cottonseed, olive oil, groundnut oil, coconut oil, palm oil, palm-kernel oil, soybean oil, sunflowerseed oil, castor oil, cottonseed oil. – [5] Million head. – [6] Beef and veal, mutton and lamb, pork, poultry meat. – [7] Million cubic metres. – [8] Groundnuts, copra, palm kernels, soybeans, sunflowerseed, castor beans, linseed, cottonseed, olive oil, groundnut oil, coconut oil, palm oil, palm-kernel oil, soybean oil, sunflowerseed oil, castor oil, linseed oil, cottonseed oil. – [9] Excluding trade between the United States and its territories. – [10] Excluding Japan. – [11] Excluding imports into Malaysia for reexport. – [12] Excluding Israel. – [13] Excluding South Africa.

ANNEX TABLE 5. – STOCKS OF SELECTED AGRICULTURAL PRODUCTS

	Date	1960-62 average	1963-65 average	1966	1967	1968	1969	1970	1971	1972 (estimated)
Wheat		*Million metric tons*								
EXPORTING COUNTRIES										
United States	1 July	36.7	26.4	14.6	11.6	14.7	22.3	24.1	19.9	23.5
Canada	1 Aug.	14.5	13.3	11.4	15.7	18.1	23.2	27.5	20.2	16.0
Argentina	1 Dec.	0.7	2.2	0.2	0.2	1.0	0.3	0.8	0.7	0.5
Australia	1 Dec.	0.9	0.6	0.4	2.2	1.4	7.3	7.2	3.4	1.2
European Economic Community	1 Aug.	[1]6.0	[1]6.6	[1]6.8	[1]5.4	5.4	7.5	4.2	4.2	6.0
TOTAL OF ABOVE		58.8	49.1	33.4	35.1	40.6	60.6	63.8	48.4	47.2
IMPORTING COUNTRIES										
India [2]	31 Dec.	...	...	1.2	0.8	2.1	2.3	3.1	5.0	...
Coarse grains [3]										
United States [4]	1 July	70.2	57.0	38.6	34.2	44.2	45.7	44.5	30.7	46.2
Canada	1 Aug.	4.0	4.8	4.5	4.9	4.4	6.7	6.9	5.5	7.7
Argentina	1 Dec.	0.4	0.2	0.1	0.6	1.8	1.7	1.8	2.3	2.5
Australia	1 Dec.	0.1	0.3	0.6	0.9	0.8	1.2	1.2	1.7	1.5
European Economic Community	1 Aug.	[5]5.2	[5]5.2	[5]4.8	[5, 6]5.1	4.7	5.1	4.5	4.5	4.2
TOTAL OF ABOVE		79.9	67.5	48.6	45.7	55.9	60.6	58.9	44.7	62.1
Rice (milled equivalent)										
EXPORTING COUNTRIES										
Pakistan [8]	31 Dec.	...	0.11	0.06	[7]0.02	0.19	0.24	0.28	[6]0.35	...
Thailand [9]	31 Dec.	0.05	—	0.04	—	[7]0.06	[10]0.30	[11]1.10	0.89	...
United States [12]	1 Aug.	0.29	0.24	0.26	0.27	0.21	0.52	0.52	0.59	0.36
Japan [13]	31 Oct.	—	—	—	—	—	9.36	9.5	[14]8.2	...
TOTAL OF ABOVE		...	0.35	0.36	0.29	0.46	10.42	11.40	10.03	...
IMPORTING COUNTRIES										
India [8]	31 Dec.	0.84	0.45	0.40	...	1.03	1.64	1.74	2.28	...
Japan [13]	31 Oct.	3.74	2.86	3.38	5.85	7.03	—	—	—	...
TOTAL OF ABOVE		4.58	3.31	3.78	...	8.06	1.64	1.74	2.28	...
Butter										
Canada and United States		0.15	0.10	0.04	0.11	0.08	0.08	0.09	0.07	...
European Economic Community [15]		0.08	0.11	0.15	0.20	0.33	0.34	0.16	0.13	...
Other European countries [16]		0.05	0.06	0.07	0.08	0.10	0.09	0.05	0.05	...
Australia and New Zealand		0.07	0.06	0.07	0.06	0.07	0.09	0.07	0.05	...
TOTAL OF ABOVE	31 Dec.	0.35	0.33	0.33	0.45	0.58	0.60	0.37	0.30	...
Dried skim milk										
United States		0.23	0.12	0.05	0.12	0.13	0.10	0.06	0.05	...
European Economic Community		...	...	...	0.20	0.31	0.39	0.18	0.08	...
TOTAL OF ABOVE	31 Dec.	...	...	...	0.32	0.44	0.49	0.25	0.13	...
Sugar (raw value)										
WORLD TOTAL	1 Sept.	15.1	13.4	19.2	19.1	20.6	19.3	21.1	18.5	15.4
Coffee										
United States	30 Sept.	[17]0.18	[17]0.22	0.20	0.16	0.31	0.20	0.21	0.18	...
Brazil	31 March	[15]3.05	3.66	4.44	4.08	3.79	3.16	2.37	1.52	1.25

[1] 1 July until 1967 included (except Federal Republic of Germany, 1 June). – [2] Government (or official agency) stocks only. – [3] Barley, oats, maize, sorghum and rye. – [4] Maize and sorghum, 1 October. – [5] 1 July until 1967 included (except France which is 1 October). – [6] From 1967 France moved from crop year October/September to July/June. – [7] November. – [8] 28 March 1972. – [9] Old crop for export. – [10] September. – [11] 31 January 1971. – [12] Converted from paddy to milled rice at 69.5 percent. – [13] Government stocks only. – [14] 31 December. – [15] Excluding Italy. – [16] Denmark, Finland, Ireland, Sweden, Switzerland, United Kingdom. – [17] 30 June.

ANNEX TABLE 6. – ANNUAL CHANGES IN CONSUMER PRICES: ALL ITEMS AND FOOD

	All items					Food				
	1960 to 1965	1965 to 1968	1968 to 1969	1969 to 1970	1970 to 1971	1960 to 1965	1965 to 1968	1968 to 1969	1969 to 1970	1970 to 1971
	Percent per year									
Developed countries										
WESTERN EUROPE										
Austria	3.9	3.0	3.4	4.4	4.7	4.4	2.1	3.4	4.7	3.8
Belgium	2.5	3.2	3.8	4.0	4.4	2.9	3.0	4.6	3.5	1.9
Denmark	5.5	7.4	4.4	6.5	5.9	4.2	7.8	5.2	8.5	5.9
Finland	5.3	6.2	2.9	2.8	6.5	5.9	[14]4.2	3.1	1.5	4.4
France	3.8	3.3	6.4	5.2	5.3	4.3	2.5	6.3	5.8	5.6
Germany, Fed. Rep. of	2.8	2.3	2.7	3.8	5.1	2.6	0.7	2.7	2.9	3.8
Greece	1.6	2.4	2.7	3.2	3.1	2.5	2.1	3.3	3.4	4.5
Iceland	11.0	9.9	22.0	13.1	6.4	15.2	[17]7.9	28.7	15.9	2.0
Ireland	4.2	3.6	7.3	8.3	8.9	3.9	2.7	6.0	7.6	7.4
Italy	4.9	2.3	2.6	4.9	3.9	4.6	1.3	2.8	4.3	4.8
Netherlands	3.5	4.3	7.5	4.4	7.6	4.0	3.4	6.5	4.3	4.2
Norway	4.1	3.7	3.3	10.6	6.3	4.5	3.3	4.0	12.9	6.0
Portugal	2.6	5.5	8.7	6.4	12.0	2.8	4.4	8.1	4.9	8.9
Spain	7.0	5.8	2.1	5.7	8.3	7.7	4.3	2.0	3.6	7.8
Sweden	3.6	4.2	2.7	7.1	7.4	5.3	3.6	3.4	8.5	9.2
Switzerland	3.2	3.7	2.5	3.5	6.6	2.9	[13]3.4	1.7	2.6	6.4
United Kingdom	3.6	3.7	5.5	6.4	9.5	3.6	3.4	6.3	7.0	11.1
Yugoslavia	13.6	11.3	10.1	10.6	17.8	17.4	8.3	8.0	12.1	21.6
NORTH AMERICA										
Canada	1.6	3.8	4.5	3.4	2.9	2.2	3.6	4.1	2.3	1.1
United States	1.3	3.3	5.4	5.9	[24]4.4	1.4	3.1	5.2	5.2	[25]2.9
OCEANIA										
Australia	1.8	3.0	2.9	3.8	6.0	2.0	2.8	1.3	3.6	3.8
New Zealand	2.7	4.4	4.9	6.6	10.4	2.4	4.0	4.7	6.6	9.1
OTHER DEVELOPED COUNTRIES										
Israel	7.1	3.9	2.5	6.1	[31]11.9	5.6	3.3	6.2	—	[31]13.0
Japan	6.0	4.8	5.2	7.4	[26]6.6	7.2	5.0	6.0	9.0	[35]5.8
South Africa	2.1	2.9	2.9	5.2	6.0	2.6	2.9	1.7	4.4	4.9
Developing countries										
LATIN AMERICA										
Argentina	23.0	26.0	7.6	13.6	34.7	23.0	23.0	6.2	16.4	41.7
Bolivia	5.1	7.9	2.2	3.9	[43]3.1	2.1	10.8	2.1	4.6	[42]2.9
Brazil	60.0	33.0	23.2	19.1	21.1	60.0	30.0	24.8	17.2	23.9
Chile	27.0	22.0	30.6	32.5	20.1	30.0	21.0	30.7	35.4	23.8
Colombia	12.4	11.1	10.1	6.8	9.1	13.4	10.2	10.5	5.2	7.5
Costa Rica	2.3	1.8	2.7	4.7	3.1	2.2	2.3	4.5	7.6	3.7
Dominican Republic	2.7	0.5	1.0	1.2	3.5	2.5	0.7	— 1.1	4.1	0.7
Ecuador	4.0	[54]4.0	6.3	5.1	[26]6.3	4.9	[54]4.6	9.9	3.2	[26]6.6
El Salvador	0.2	0.9	— 0.3	2.9	0.2	1.1	2.3	— 0.5	4.9	0.3
Guatemala	0.1	1.0	2.2	2.4	[60]0.8	0.1	1.2	1.2	4.0	[60]0.3
Guyana	1.9	2.7	1.3	3.4	2.0	2.3	3.0	0.5	4.5	2.2
Haiti	3.7	2.1	1.3	0.7	10.3	4.1	2.2	2.4	1.4	6.1
Honduras	2.7	2.2	2.7	2.8	0.8	3.2	1.3	— 0.4	5.5	1.9
Jamaica	2.9	[12]5.5	6.2	9.7	[26]6.7	2.4	[12]7.7	6.5	11.0	[28]8.4
Mexico	1.9	3.2	2.9	5.1	[62]2.5	1.6	3.5	2.9	5.8	[63]3.5
Peru	9.4	[79]9.4	6.3	5.0	6.8	10.5	[71]10.6	5.3	3.1	6.9
Puerto Rico	2.2	3.3	3.2	3.4	4.3	3.0	4.3	4.0	3.7	5.7
Uruguay	[81]16.2	95.0	20.9	16.4	23.9	[81]13.1	95.0	12.4	11.7	24.5
Venezuela	[91]1.7	1.0	2.4	2.1	2.7	[91]1.7	0.1	2.9	1.2	2.9

See notes page 189.

ANNEX TABLE 6. – ANNUAL CHANGES IN CONSUMER PRICES: ALL ITEMS AND FOOD (*concluded*)

	All items					Food				
	1960 to 1965	1965 to 1968	1968 to 1969	1969 to 1970	1970 to 1971	1960 to 1965	1965 to 1968	1968 to 1969	1969 to 1970	1970 to 1971
	Percent per year									
FAR EAST										
Ceylon	1.7	2.6	7.3	5.9	2.7	1.3	4.1	5.6	6.7	2.0
India	6.1	8.9	...	5.1	3.3	6.5	9.8	...	5.3	1.5
Indonesia	...	...	6.1	12.3	8.5	...	...	3.1	9.2	2.6
Khmer Republic	4.3	1.6	6.3	10.2	74.4	2.7	1.4	10.5	14.4	104.3
Korea, Rep. of	15.4	[5]10.8	12.4	16.0	15.3	18.3	[5]9.1	16.1	21.6	20.3
Laos	38.0	8.9	3.2	0.4	0.8	39.0	9.8	1.8	6.9	0.1
Malaysia, West	0.5	1.9	— 1.0	1.3	1.5	0.6	1.9	— 1.0	—	4.6
Pakistan	2.6	4.7	3.2	5.4	4.7	3.8	4.5	3.1	7.4	5.2
Philippines	[4]4.8	3.9	3.1	5.4	...	[4]6.8	6.5	1.3	9.8	...
Thailand	1.5	3.3	2.1	0.8	2.0	2.0	5.7	4.0	0.2	0.7
NEAR EAST										
Cyprus	0.3	[1]0.6	2.3	2.4	4.1	0.2	[1]1.1	4.1	1.4	4.8
Egypt	3.2	[1]4.8	3.4	3.7	[11]3.7	6.5	[1]4.6	5.6	6.8	[11]6.7
Iran	2.0	0.7	3.1	1.7	[3]4.1	3.1	0.2	2.5	0.6	[3]6.5
Iraq	...	1.6	9.1	4.4	[2]4.1	...	1.6	6.9	3.9	[2]5.1
Jordan	...	...	7.8	6.8	4.2	...	...	21.5	7.8	6.2
Libyan Arab Republic	...	5.3	8.6	[3]1.3	...	...	7.2	11.9	[3]0.9	...
Sudan, the	3.3	0.5	12.5	...	[10,11]0.7	4.2	— 0.1	11.7	...	[10,11]—1.7
Syrian Arab Republic	[9]1.3	4.6	— 0.9	1.5	5.9	[9]1.3	6.6	—	0.7	6.3
Turkey	3.6	9.3	4.8	7.9	[6]17.1	4.8	9.7	5.6	7.2	[6]14.6
AFRICA										
Gabon	[8]4.4	2.7	2.7	4.3	3.4	[8]3.3	2.5	3.1	2.4	6.4
Ghana	11.8	2.2	8.8	2.9	[6]2.1	14.0	— 0.2	12.3	3.1	[6]1.3
Ivory Coast	2.6	3.9	4.4	8.6	— 0.8	2.8	3.2	7.3	12.8	— 2.4
Kenya	2.0	2.2	— 0.3	2.3	[11]2.1	1.9	2.9	— 1.1	2.5	[11]2.6
Liberia	...	3.7	10.3	0.7	[4]0.8	...	1.5	11.9	1.2	[4]— 8.5
Madagascar	...	1.6	3.8	2.9	5.4	...	1.1	4.5	3.0	5.3
Mauritius	[9]1.0	3.7	2.3	1.5	0.3	[9]0.6	4.3	0.6	1.3	0.1
Morocco	4.0	— 0.4	2.9	1.3	4.1	4.6	— 1.3	3.2	1.1	6.4
Mozambique	[12]1.9	3.7	2.4	4.7	[3]14.8	[12]0.7	4.3	5.1	5.6	[3]13.3
Niger	...	2.6	10.4	1.0	[11]4.1	...	3.1	16.1	— 2.4	[11]5.3
Nigeria	3.2	1.8	9.9	13.2	13.6	2.0	0.6	21.2	23.6	26.1
Sierra Leone	[12]3.9	3.5	3.3	7.6	— 2.3	[12]0.6	2.0	4.6	14.1	— 5.7
Tanzania	1.2	3.7	1.0	3.0	3.7	1.2	2.7	— 2.0	3.6	5.0
Tunisia	[9]4.5	3.1	4.2	1.0	6.9	[9]4.8	3.0	5.3	1.5	10.1
Uganda	5.4	— 1.4	11.7	9.8	15.7	7.3	— 3.3	9.3	13.2	24.7
Zambia	2.4	8.6	2.4	...	[10]6.1	2.4	8.8	1.6	...	[10]6.6
Zaire	[13]15.6	34.0	13.6	3.2	4.9	[13]19.0	33.0	9.5	3.2	10.2

[1] 1965 to 1967. – [2] January-November. – [3] January-October. – [4] January-July. – [5] 1966 to 1968. – [6] January-September. – [7] 1965 to 1966. – [8] 1960 to 1962. – [9] 1962 to 1965. – [10] New series. – [11] January-August. – [12] 1961 to 1965. – [13] 1963 to 1965.

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