THE STATE OF FOOD AND AGRICULTURE 1948

A Survey of World Conditions and Prospects

Washington, D. C., U.S.A. September 1948

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Washington, D. C., U.S.A. September 1948

FOREWORD

THE STATE OF FOOD AND AGRICULTURE, 1948 has been prepared at the request of member governments as a basic document for the intergovernmental consultations on plans and programs at the Fourth Session of the FAO Conference in November; but it is also addressed to the general public.

The world still suffers from a shortage of food, fibers, and forest products, even if the situation may become less acute in the current year. Hence, it is important to ascertain to what extent governments have programs which will put an end to scarcities within a reasonable time and go on to provide a more adequate level of supplies, particularly in the low-income countries. From the information available to FAO, I am convinced of two things: first, much more is being done to expand production around the world than is generally realized (and another Conference document, *National Progress in Food and Agriculture Programs,* will illustrate this); second, what is being done, although so noteworthy, is far from sufficient to make any significant improvement upon the low living standards of most peoples.

In my belief, the difficulties which stand in the way of a really rapid expansion of production should be examined more energetically by governments, and decisions should be taken which will enlarge the programs and facilitate their speedier execution. There have been enough generalizations; what is now needed is practical action.

The present Report, in spite of limitations and imperfections due to inadequate data, delineates the central issues clearly enough to enable governments to consult together and decide what practical steps should be taken next. With this Report as an over-all guide it is my hope to see action initiated or intensified in a wide variety of fields to expand production, improve national and international distribution, and raise living standards throughout the world.

Director-General

CONTENTS

PART I. WORLD REVIEW

1. INTRODUCTION 1

2. THE CURRENT SITUATION 4

Consumption—4. Production—9. Trend of Prices—10. International Trade—13.

3. THE NEXT THREE YEARS 18

The Outlook for 1948/49—18. Later Trends—19.

4. CONSUMPTION GOALS 21

5. THE BATTLE FOR AGRICULTURAL PRODUCTION 24

Soil Erosion—24. Technical Efficiency—25. Cultivating New Land—27. Reduction of Waste—29. Economic Factors—30. Social Factors—30. Wider Horizons—31. General Considerations—32.

6. ORIENTATION OF INTERNATIONAL TRADE 33

7. NEXT STEPS 35

Special Projects—35. Regional Formulation of Plans and Programs—36. Review of International Trade—36. Tools for World Review—37.

PART II. PROBLEMS OF THE REGIONS

8. LOWER-INCOME, DENSELY POPULATED REGIONS 41

The Far East 41

Production and Trade—42; China; India and Pakistan; The Five Food Exporters—Burma, Indo-China, Indonesia, the Philippines, and Siam; Food-importing Countries (Ceylon, Malaya, Japan, and Korea). Consumption—48. Increasing Supplies—50. Nutritional Policy—53. More General Problems—54. Forestry and Forest Products—54.

The Near East 56

Production and Trade—57. Consumption Levels—60. Plans and Programs—61. Improving Nutrition—62. Forestry and Forest Products—62.

9. LOWER-INCOME, SPARSELY POPULATED REGIONS 64

Latin America 64

Production and Trade—64; General; Selected Countries. Consumption Levels—69. Increasing Supplies—72. Improving Nutrition—76. Forestry and Forest Products—77.

Africa 79

Production—80; French North Africa; French West Africa; French Equatorial Africa and the Cameroons; Liberia; British West Africa; Belgian Congo and Portuguese Territories; British East Africa; Nyasaland and Northern and Southern Rhodesia; Union of South Africa; Madagascar, Mauritius, and Réunion. Foreign Trade—86. Consumption and Nutrition—88. Increasing Supplies—90. Forestry and Forest Products—91.

Union of Soviet Socialist Republics 93

Postwar Recovery in Soviet Agriculture—93. The 1947 Harvest Results—93. 1948 Production and Consumption Prospects—94. The 1950 Agricultural Targets—95. Forestry and Forest Products—96.

10. HIGHER-INCOME, DENSELY POPULATED REGIONS 98

Europe 98

Production—99. International Trade—100. Consumption—101. Programs for the Future—109; Production; International Trade; Consumption. Forestry and Forest Products—115.

11. HIGHER-INCOME, SPARSELY POPULATED REGIONS 120
The United States of America, Canada, Australia, and New Zealand 120
Production and Trade—121; United States of America; Canada, Australia, and New Zealand. Consumption—129. Plans and Programs—131; United States of America; Canada, Australia, and New Zealand. Conclusions—134. Forestry and Forest Products in Canada and the United States—135. Forestry and Forest Products in Oceania—137.

PART III. COMMODITY SITUATIONS

12. AGRICULTURAL PRODUCTS—FOOD 141
Cereals 141
Review of 1947/48—141. 1948/49 Position—143. Future Outlook—144.
Rice 149
Current Situation—149. Future Outlook—150.
Fats and Oils 152
Production and Trade—152. 1948/49 Supply Prospects—154. Future Outlook—155.
Sugar 158
Current Situation—158. Future Outlook—160.
Livestock Products 161
Current Situation—161. Future Outlook—164.
13. AGRICULTURAL PRODUCTS—FIBERS 166
Recent Trends—168. Production Outlook—168; Cotton; Wool; Silk; Flax and Hemp; Jute; Hard Fibers; Rayon. Changes in Production Pattern—169. World Consumption and Trade—170. 1948/49 World Trade Outlook—173. Long-Term Outlook—175.
14. FISHERIES PRODUCTS 178
Recent Developments by Regions—178; Europe; North America; Latin America; Africa; Oceania; Far East. World-wide Trade Trends—182. Whaling—184. Outlook—184.
15. FOREST PRODUCTS 186
Sawn Lumber—187; Europe, including U.S.S.R. and Near East; United States and Canada; Other Regions. Pulp and Paper—194. Pitprops—196. Railway Sleepers—197. Plywood—197. Fiberboards—197.

PART IV. TOOLS FOR PRODUCTION

16. FERTILIZERS 201
Nitrogen—201; Europe; North and South America; Asia and Africa; Oceania. Phosphates—203. Potash—204.
17. FARM MACHINERY AND DRAFT POWER 205
Production and Overseas Trade in Farm Equipment—206. Spare Parts for Machinery Already on Farms—208. Servicing Problems—208. Effective Use in Previously Unmechanized Areas—209. Future Prospects—209. Forestry Equipment—210.

APPENDIX

CONSTRUCTION OF AN INDEX OF AGRICULTURAL PRODUCTION 212

PART I

WORLD REVIEW

Chapter I

INTRODUCTION

It is now three years since the termination of hostilities, and three years in October since the establishment of the Food and Agriculture Organization of the United Nations. These have been years of world-wide shortages, especially of agricultural and forestry products, on a scale as unparalleled as it was unforeseen. From 1945 until mid-1947 the crisis was generally expected to be over within a few months or after the next harvest; it was called a "short-term" crisis. Only during the past twelve months have governments come to regard it as something more persistent.

Perhaps the major error lay in an underestimation of the degree and extent of war damage in Europe and Asia. Destruction was more widespread and far-reaching than in World War I. Not only did agricultural production in these continents decline, resulting in reduced consumption levels and virtual elimination of Asia's food exports, but the dislocation of manufacturing industry left Europe and Japan with little to export and farmers in Asia and other areas with few incentive goods from the customers needing the food. In particular, the collapse of Germany and Japan and their present inability to export or import has left an economic vacuum which gravely affects countries with which they had had close commercial relationships. Thus, not only were the deficit countries more deficit, but many of their former suppliers were no longer in the export business.

Just as the loss and deterioration of capital have been greater than at first realized, so also has been the effort needed for reconstruction. Full employment is found almost everywhere—in the recovering countries of Europe and the Far East, in the developing countries of Latin America, and in the expanding countries such as the United States of America and Canada. Large money incomes are being generated, but the output of consumption goods is quite inadequate to match the level of consumer purchasing power. The inflationary situation, aggravated in many cases by premature removal of controls, has spread around the world. Food shortage itself makes a major contribution to the inflation since consumer demand for food is stronger than for other goods and therefore, in the absence of controls, food prices press upward, pushing the cost of living up too, with consequential upward pressure on wages. The inflation is now seen to be more persistent and protracted than was anticipated, and the early attempts to control it in some countries are breaking down.

A third phenomenon arising out of the war is a geographic shift of wealth. While Europe, Asia, and in some respects Africa each suffered a setback in World War II, the countries of the Western Hemisphere, particularly the United States, have increased their output and their equipment for production. This shift, so especially marked in

respect of food and industrial equipment, may be temporary only in part; to the extent that it proves permanent it creates special payments difficulties. For unless, when Europe and Asia once again have products to offer, the Western Hemisphere is willing to import on a large enough scale to rectify the balance of payments, that problem, like the food problem, may prove to be more persistent than temporary.

A fourth new phenomenon is the increasing degree of political independence, especially in many low-income countries of the Far East. The new authorities naturally express impatience with existing living standards and make efforts to begin improving them. Furthermore, the war-induced economic changes have increased the purchasing power of the rapidly expanding city populations. As a result, the low-income countries have made claims for larger quantities of food, claims which Africa and South America have fulfilled largely by reducing the volume of their food exports, but which the Far East has been unable to meet despite its change-over from a food-exporting to a food-importing region.

A fifth factor is the new attitude of governments and the public toward food. During the war many governments assumed special responsibility for their people's food supplies, and in a number of countries this policy has continued. The public became food and nutrition conscious during the war, realizing for the first time that enough food of the right kinds could effect a major improvement in health and that food production and distribution should be organized to this end. One expression of this new attitude toward food and agriculture was the establishment of FAO.

Since this attitude is basic to the work of FAO and to the problems which are to be discussed in this Report, it is worth recalling that the new approach is a direct outcome of the advances in biological research during the last 50 years. Up to the end of the last century the knowledge of nutrition comprised mainly the quantitative elements. Food was considered as fuel, and its value expressed in calories. Around the turn of the last century the importance of qualitative food factors—the importance of the so-called vitamins (and also qualitative factors of a different type in proteins, etc.)—began to be understood.

It became apparent that a deficiency of these factors is followed by very distinct disturbances of the health of man and also of domestic (farm) animals. Only gradually was it understood that a relatively small scarcity of each of these factors decreases the evolution, growth, and health of the body and its resistance against stress (physical or psychological) and against infection. Finally it was realized that malnutrition, even in a degree far from actual hunger, tends to make people inefficient and irrational in their activities, and that the converse is also true: a people cannot be a healthy and benevolent people without adequate amounts of the right kinds of food.

The experiences of the war have brought food to occupy a central position in government policy in many countries and it may ultimately take such a position in all countries. Furthermore, the persistent scarcity of supplies and the emergency of special problems, which will presently be discussed, impelled governments at the last session of the FAO Conference to recognize the need for periodic discussion of the state of food and agriculture. They resolved to hold an annual review of food and agriculture plans and programs in an attempt to assess the current and prospective situation. The Conference asked governments to provide and the secretariat of FAO to assemble documentation for such a review. This Report is intended to serve that purpose. Based partly on the material submitted by governments in their annual reports to FAO and partly on other available information, it is envisaged as the first report in an annual series. It is necessarily incomplete at many points. Too many governments have submitted no reports or

have sent reports too incomplete or too late. In many countries work on the preparation of plans and programs has not made much progress, but it is hoped that in subsequent years more will have been accomplished and that the reporting on such work will be more complete.[1]

Nevertheless, however imperfect the statistical basis may be, it does seem possible to identify the major problems in food and agriculture which will be confronting governments for the next few years. It does seem possible to indicate the order of magnitude of some of these problems and to begin making suggestions as to the roads along which solutions may be sought. In subsequent years it should prove possible, if the governments wish this type of study and discussion to be continued, to break up the major problems into their component parts and to analyze in greater detail the difficulties which will have to be overcome. While this first Report attempts only to paint the picture with very broad strokes, FAO hopes to ascertain from governments their views on how this type of analysis may be improved.

[1] A report entitled *National Progress in Food and Agriculture Programs* will be presented to the forthcoming session of the FAO Conference.

Chapter 2

THE CURRENT SITUATION

Consumption

THE supply of food available for consumption in 1947/48 was greater than in 1946/47 in every major region of the world except western Europe, where there was an unfortunate crop failure. Food supplies in Europe and the Far East are still below prewar but are recovering gradually (see Table 1).

TABLE 1.—INDEX NUMBERS OF SUPPLIES OF FOOD, TEXTILES, AND FOREST PRODUCTS AVAILABLE FOR CONSUMPTION IN 1946/47 AND 1947/48

Area	Food [1]		Textiles [2]		Forest Products [3]	
	1946/47	1947/48	1946/47	1947/48	1946/47	1947/48
	(*Index: 1934–38=100*)				(*Index: 1937=100*)	
Far East	92	95	69	71	61	68
Europe (excl. U. S. S. R.)	77	75	78	87	65	70
United States and Canada	[4] 126	[4] 122	155	144	[5] 138	[5] 144
Latin America	119	127	137	141	135	136
Australia and New Zealand	[6] 108	[6] 110	140	167	100	102
Africa and Near East	...	...	128	146	101	102
WORLD AVERAGE (excl. U. S. S. R.)	95	96	99	101	100	105

[1] Based on data for 53 countries covering 85 percent of the world's population. For description of methods of calculation of the food index numbers see the Appendix.
[2] Based on mill consumption of cotton and clean wool (adjusted for trade in textiles) and domestic production of rayon filament yarn and staple fiber. No price-weighting.
[3] Index numbers constructed on the assumption that a standard of sawn lumber (4.672 m^3) is roughly equivalent in value to one metric ton of wood pulp.
[4] Base period is 1935–39.
[5] Includes Mexico.
[6] Base period in Australia is 1936/37–38/39; in New Zealand, 1935–39.

Consumption of apparel fibers likewise improved during the year, and in the world as a whole it is now at about the prewar level; it is still very low, however, in the Far East. If industrial fibers could be included, the index would be below rather than above prewar. The supply of lumber and pulp is recovering only slowly in Europe and the Far East, but continues to expand in North America.

The picture of available supplies is only part of the total picture. The world's population has been increasing and, even if supplies were at just the same level today as before the war, the amounts available *per person* would be less. During what is roughly an 11-year period (from a mid-point in 1934-38 to mid-1947), population increases ranging from 3.5 percent in Europe to 24 percent in Latin America have occurred (see Table 2).

TABLE 2.—POPULATION OF THE WORLD: PROVISIONAL ESTIMATES FOR 1934–38 AND 1947

Area	1934–38	1947	Percentage Increase [1]
	(*Millions*)		(*Percentage*)
Far East (excl. postwar area of U. S. S. R.)	1,066	1,162	9.2
Europe (excl. postwar area of U. S. S. R.)	370	383	3.5
North America	139	157	12.6
Central and South America [2]	123	153	24.0
Oceania	10	12	14.8
Africa	121	140	11.4
Near East	106	119	11.2
U. S. S. R. (postwar area)	[3] 186	[3] 195	[3] 10.5
WORLD TOTAL OR AVERAGE (incl. all areas)	[3] 2,120	[3] 2,320	[3] 9.4

[1] Percentages computed before rounding.
[2] Includes Mexico.
[3] FAO estimates; the other figures are based mainly on data furnished by the Statistical Office of the United Nations.

It should be noted that, partly perhaps because of 17 years of warfare, the rate of increase in the Far East is less than in any of the other continents except Europe. However, since population data are inadequate for many of the less developed countries, these estimates must be considered with due reserve.

Applying the estimates of population to the data in Table 1, we come to the estimates of consumption per person in each continent in relation to prewar shown in Table 3.

Supplies per person have naturally fallen more (compared with prewar) than the absolute quantity of supplies (Table 1) because population has been increasing. The

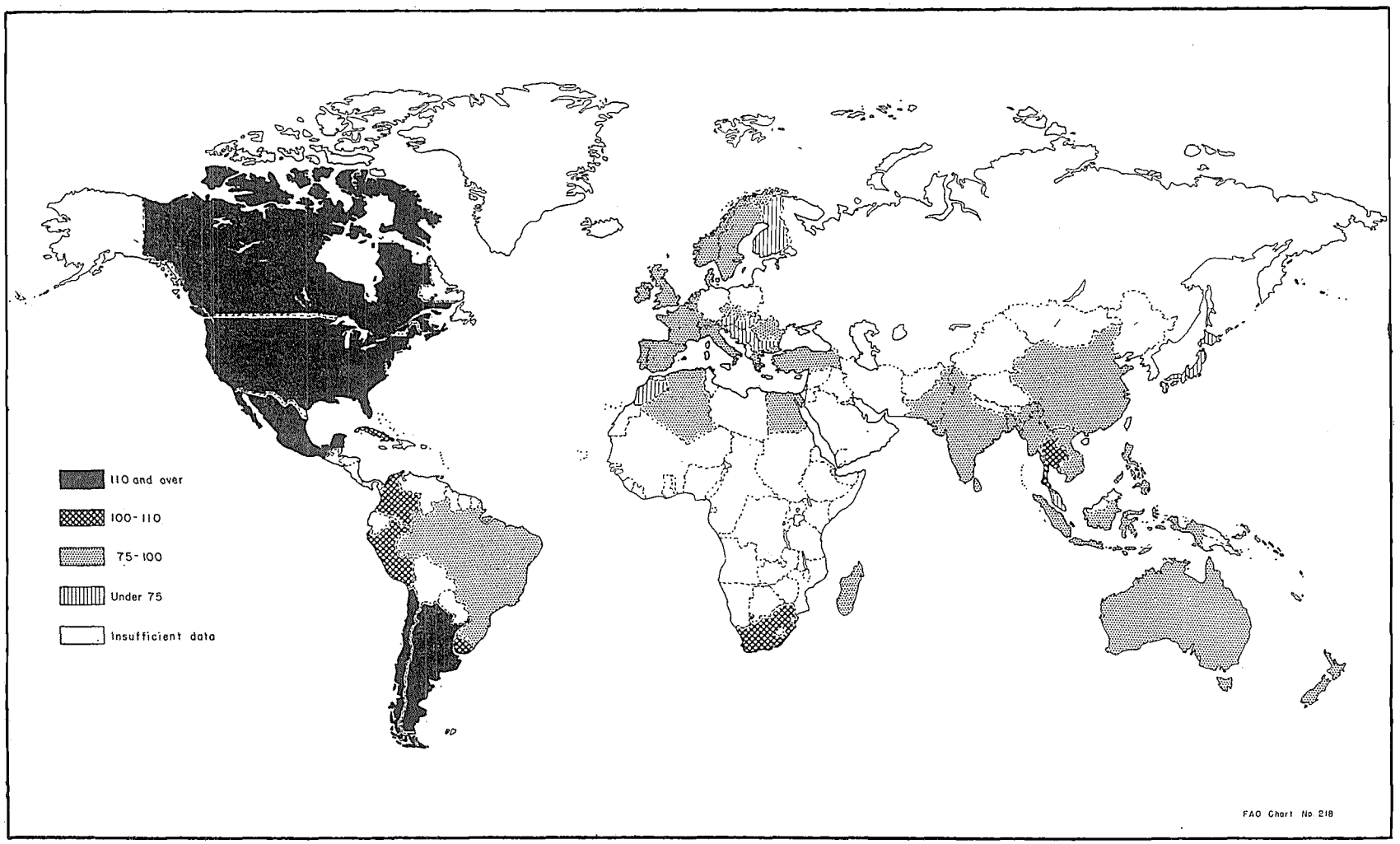
TABLE 3.—INDEX NUMBERS OF SUPPLIES OF FOOD, TEXTILES, AND FOREST PRODUCTS AVAILABLE PER CAPUT IN 1946/47 AND 1947/48

Area	Food [1]						Textiles [2]		Forest Products [3]	
	1946/47			1947/48						
	Total	Crops	Animal Products	Total	Crops	Animal Products	1946/47	1947/48	1946/47	1947/48
	(*Index: 1934–38=100*)								(*1937=100*)	
Far East	84	87	74	87	90	78	63	65	56	62
Europe (excl. U. S. S. R.)	73	81	66	73	82	64	76	84	63	68
United States and Canada [4]	112	103	122	108	97	121	137	128	[5] 122	[5] 128
Latin America	96	101	92	102	113	95	110	114	109	110
Australia and New Zealand [6]	94	95	94	96	107	92	122	145	87	89
Africa and Near East	...	...	...	...	...	...	111	127	88	89
WORLD AVERAGE (excl. U. S. S. R.)	86	88	83	88	90	86	91	92	92	96

[1] Based on data for 53 countries covering 85 percent of the world's population. For description of methods of calculation of the food index numbers see the Appendix. The 1947 population figures have been applied both to 1946/47 and to 1947/48 supplies.
[2] Based on mill consumption of cotton and clean wool (adjusted for trade in textiles) and domestic production of rayon filament yarn and staple fiber. No price-weighting.
[3] Index numbers constructed on the assumption that a standard of sawn lumber (4.672 m^3) is roughly equivalent in value to one metric ton of wood pulp.
[4] For food items base period is 1935–39.
[5] Includes Mexico.
[6] For food items base period in Australia is 1936/37–38/39; in New Zealand, 1935–39.

Chart 1

FOOD SUPPLIES PER PERSON IN 1947/48 COMPARED WITH PREWAR (1934-38=100)



difference is most marked in Latin America, where the population increase has been most rapid. Additional figures are given to show the divergent trends in supplies of crop and livestock products. In North America livestock products have been relatively plentiful; in all other regions consumers have had to increase the proportion of crop products in their diet.

Chart I shows the changes in per caput food supplies (valued at constant prices) in each of the 53 countries for which information is available. It indicates the contrast between the Western Hemisphere on the one hand and central and eastern Europe on the other. It must be remembered, however, that a fall of, say, 20 percent, from a low prewar dietary level in a Far Eastern country may be nutritionally as serious as a fall of 30 percent from a relatively high calorie level in a European country.

As regards the energy value of the food supplies, the current situation shows that apart from Argentina, Oceania, Canada, the United States, and a few European countries the food supply of any single country would be nutritionally inadequate even if distributed evenly throughout the population. As it is, the inequality of distribution results in certain sections of the population faring much worse than the national average suggests. It must be noted, however, that when effective rationing measures have been instituted and special food programs developed for the most needy groups of the population, the inequality of distribution has been mitigated to a significant degree. So significant has this change been that it would appear in some countries to be reflected in improved national health returns, despite a worsening of the over-all food supply of the countries concerned.

With regard to textiles, equivalent results could not be obtained; nevertheless, by rationing and price control, some countries were able to assure everyone a basic minimum supply, which may have meant a higher than prewar consumption level for some of the lower-income groups.

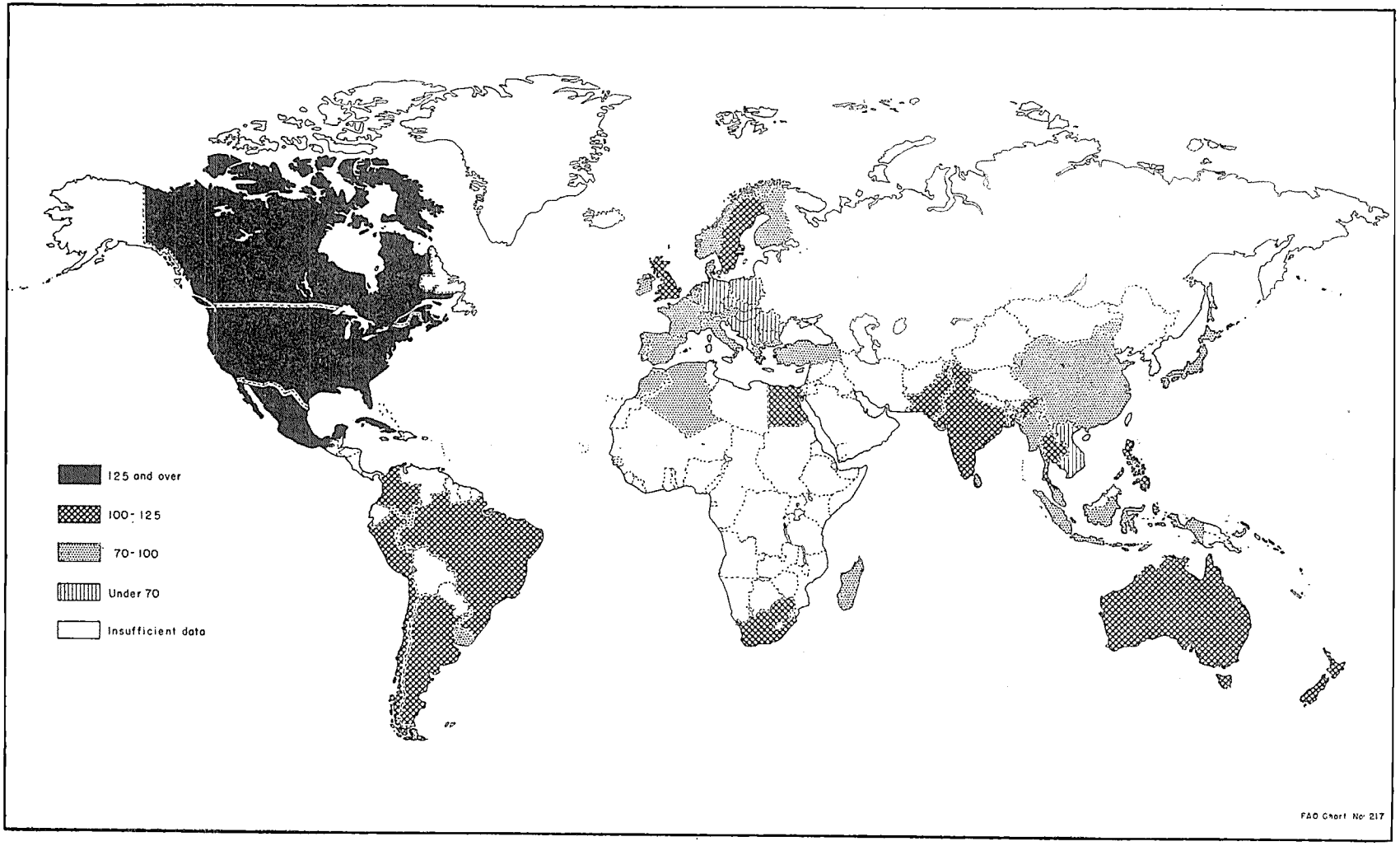
In Europe and the Far East the shortage of forest products is seriously hampering reconstruction. The lumber scarcity delays the construction of factories and new dwellings and the pulp shortage curtails the number and size of newspapers, periodicals, and books.

In most countries the money income of the wage-earning population as a whole has increased over the prewar average more proportionately than the cost of living or the cost of food. The changes in consumption which would normally result from these increases in income have not taken place because of shortage of supplies. In some countries there has been little or no increase in consumption, in some there has been an increase only in crop products (extra livestock products not being available), while in some the switch to livestock products and other expensive foods was less than would be expected. Some of these countries are exporting countries which curtailed internal consumption in order to maintain or expand their food exports. If in some of these countries there were to be a change in policy allowing consumers a first pick of total production, the result would be (a) a marked drop in exports and (b) some shift in production from crops to livestock products.

Further evidence of the gap between money demand for foodstuffs and the available supply is to be found in the manner in which food prices, as compared with 1946, continued to rise quite sharply in 1947 and 1948, a period in which price and ration controls were relatively ineffective or were removed. In the United States, for example, retail food prices rose by some 20 percent between 1946 and 1947 and were still rising through the first half of 1948 (see Table 6). A few countries, such as the United Kingdom, continue to subsidize staple foods at the retail level to an extent which has kept prices of these foods low.

Chart II

FOOD OUTPUT IN 1947/48 COMPARED WITH PREWAR (1934-38=100)



There are signs that production, at least of some commodities, is beginning to catch up with international demand. As long as scarcities were acute, prices counted for little; but as the volume of supplies improves, the quantities which deficit countries will import begin to depend again upon price. Already wheat and sugar prices on the world market have fallen significantly from the peak points reached in recent years, though they are still far above prewar levels. This might presage the beginning of the end of the inflationary movement. If, however, the remaining controls on food imports were removed prematurely, a new outburst of inflation might commence since demand, if completely uncontrolled, would exceed supply at present prices.

Production

Changes in consumption levels are related closely to changes in production since for the staple products only a small part of the world's food and timber output enters international trade. Food production in 1947/48 was higher than in the previous year in all regions of the world except Europe (drought in western and central regions) and North America (small maize crop). But as year-to-year changes are mainly the result of weather, a more substantial comparison is with the prewar period, although it should be recognized that the years 1934-38 were not necessarily normal for all continents. For example, in Latin America they represented one stage in a rapid upward trend of production, whereas in the United States 1935-39 had to be taken because 1934-38 would have included two drought years.

TABLE 4.—INDEX NUMBERS OF VOLUME OF PRODUCTION OF FOOD, FIBERS, AND FOREST PRODUCTS IN 1946/47 AND 1947/48

Area	Food [1]		Fibers [2]		Forest Products [3]	
	1946/47	1947/48	1946/47	1947/48	1946	1947
	(*Index: 1934–38=100*)				(*Index: 1937=100*)	
Far East	90	93	55	70	81	92
Europe (excl. U. S. S. R.)	76	74	92	102	63	67
United States and Canada	[4] 135	[4] 129	79	105	[5] 134	[5] 144
Latin America	114	120	103	106	197	197
Australia and New Zealand	[6] 96	[6] 111	104	105	160	162
Africa and Near East	...	...	86	87	155	155
WORLD AVERAGE (excl. U. S. S. R.)	95	96	74	88	105	110

[1] Based on 53 countries; for method of calculation see the Appendix.
[2] Index numbers on tonnage basis; includes cotton, wool (clean basis), raw silk, rayon, nylon, flax, hemp, jute, abaca, sisal, and henequen.
[3] Index numbers constructed in the assumption that a standard of sawn lumber (4.672 m^3) is roughly equivalent in value to one metric ton of wood pulp.
[4] Base period is 1935–39.
[5] Includes Mexico.
[6] Base period in Australia is 1936/37–38/39; in New Zealand, 1935–39.

The memorable fact is that the world is still producing less food, less fibers, and only slightly more forest products than before the war, although population continues to increase. Table 4 shows the remarkable contrast between the expansion in the Western Hemisphere and the severe decline in Europe. This applies both to food and forest products. The output of fibers has undergone less striking change except in the Far East. Chart II shows the changes in food production compared with prewar in each of the 53 countries having adequate data.

TABLE 5.—CONTINENTAL SHARES IN WORLD PRODUCTION OF FOOD, FIBERS, AND FOREST PRODUCTS, PREWAR AND POSTWAR

Area	Food		Fibers		Forest Products	
	1934–38	1947/48	1934–38	1947/48	1937	1947
	(*Percentage*)					
Far East	35	33	42	33	9	7
Europe (excl. U. S. S. R.)	33	25	8	9	40	25
United States and Canada	18	25	29	34	48	64
Latin America	8	10	9	11	2	3
Australia and New Zealand	2	3	3	4	}	
Africa and Near East	[1] 4	[1] 4	9	9	} 0.1	0.2
WORLD AVERAGE (excl. U. S. S. R.)	100	100	100	100	100	100

NOTE: This table is constructed from the same material as Table 4; the notes appended to that table apply to this one.

[1] These figures are entered for completeness but they are not representative of the two regions; as explained in the Appendix, adequate data are lacking.

The fall in production in Europe and Asia and the increase in North, Central, and South America implies a shift in shares in production as shown in Table 5.

The increased importance of the Western Hemisphere, which has been developing for the past 30 years and was accelerated by World War II, will be a recurring theme in this Report. To some extent the phenomenon is temporary until Europe and Asia recover, but in other respects it would seem to be permanent and gives rise to serious problems. One problem is the danger to deficit countries of heavy dependence on food supplies from an area in which the weather may occasion violent fluctuations in production; another is the difficulties experienced by some of the exporting countries in playing a normal role in international trade.

Statistics of the actual production of staple foodstuffs in the principal regions are given in Part III.

Trend of Prices

The prolonged period of food shortage during and since the war has brought substantial benefit to farmers in all countries. Agricultural prices have risen more than the general level of prices, including the prices of things farmers buy, because it was desirable to induce farmers to produce as much as possible and because in many cases the extra effort required of them involved investments which might not be fully amortized before some of the products ceased to be wanted in such large quantities.

Table 6 shows that, in seven out of the eight countries quoted, retail food prices have increased during and since the war much less than wholesale food prices or prices paid to agricultural producers. In both sets of prices there has been a substantial further increase between 1946 and 1948, and this applies also to prices of fibers and lumber (Tables 7 and 8).

Data are not available for sufficient countries to show relative changes in the prices of the things farmers sell and the things they buy. It is possible, however, to compare wholesale agricultural with wholesale industrial prices in a certain number of countries (see Chart III). The chart illustrates three things: the price decline of 1929-32, the

TABLE 6.—INDEX NUMBERS OF WHOLESALE PRICES OF AGRICULTURAL PRODUCTS AND OF THE RETAIL COST OF FOOD

Country	Agricultural Prices			Cost of Food			
	Wholesale			Retail			
	1946	1947	Jan.-June 1947	1946	1947	Jan.-June 1947	Jan.-June 1948
	(*Index: 1935–39=100*)			(*Index: 1937=100*)			
Canada	171	184	217	136	155	146	182
Czechoslovakia [1]	285	293	296	342	317	323	322
Sweden	170	182	[2] 192	148	156	153	168
Chile	283	389	[2] 429	281	377	362	419
India [3]	290	323	[4] 382	278	302	289	[5] 289
	Prices Paid to Producers						
United Kingdom	211	233	254	122	...	120	[6] 109
United States	217	259	271	152	184	178	198
Norway [7]	224	239	244	163	162	163	160

NOTE: For further price estimates see FAO, *Monthly Bulletin of Food and Agricultural Statistics*, Washington, D. C.

[1] March 1939=100 for agricultural wholesale prices.
[2] Five months ending May.
[3] 15–21 August 1937=100 for agricultural wholesale prices.
[4] March 1948.
[5] April 1948.
[6] New index on base 17 June 1947=100.
[7] 1938/39=100 for prices paid to producers.

TABLE 7.—INDEX NUMBERS OF FIBER PRICES

Fiber Quotation	Fiber Prices		
	1946	1947	June 1948
	(*Index: 1934–38=100*)		
Cotton			
Ten U. S. Markets	273	308	331
Wool			
Australian 64's, average clean basis, London	125	192	336
Jute			
Indian, Native Firsts, New York	228	367	407

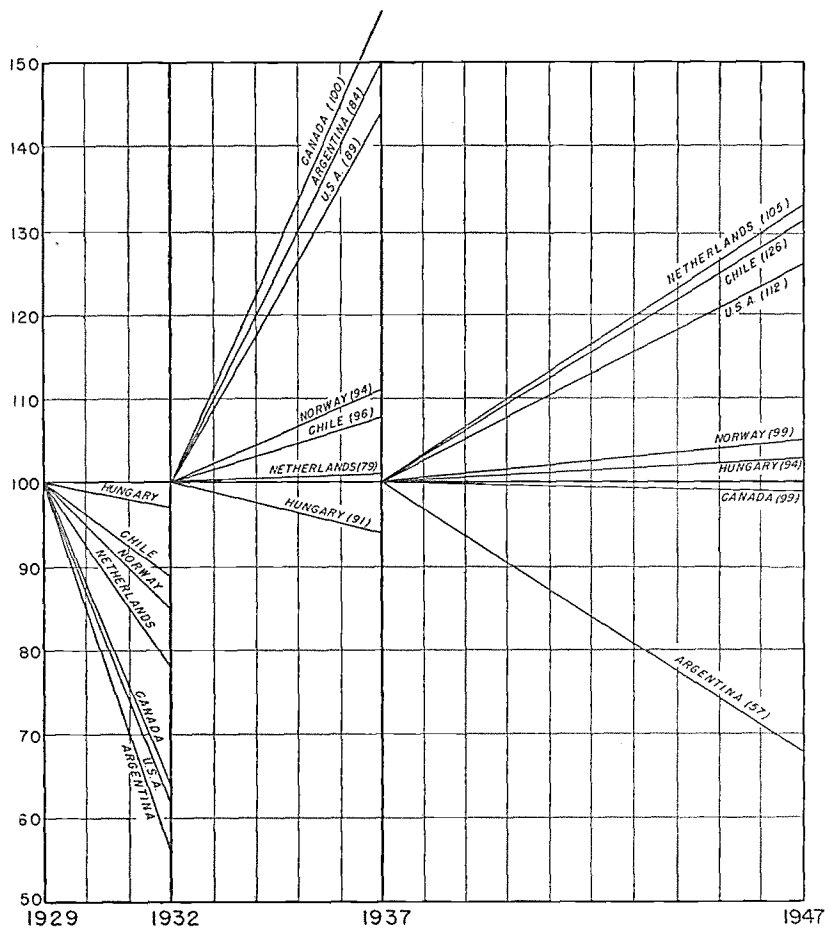
TABLE 8.—INDEX NUMBERS OF LUMBER PRICES

Country	Lumber Prices		
	1946	1947	May 1948
	(*Index: 1938=100*)		
United States [1]			
Internal wholesale price	204	317	358
United Kingdom [2]			
Import price, c. i. f.	280	318	369
Canada [1]			
Export price	250	324	...

[1] All lumber.
[2] Sawn softwood lumber.

Chart III

RATIO OF INDEX NUMBERS OF WHOLESALE PRICES OF AGRICULTURAL PRODUCTS TO WHOLESALE PRICES OF INDUSTRIAL PRODUCTS



FAO Chart No. 220

Note: Figures in parentheses show the ratio by reference to the base period 1929=100

rise of 1932-37, and the further rise of 1937-47. Of the seven countries cited, only three —Chile, the United States, and the Netherlands—had by 1947 obtained a ratio of agricultural to industrial prices more favorable to farmers than in 1929. This confirms other evidence (for example, concerning the terms of trade in foodstuffs versus manufactures) that agriculture in many parts of the world, although better placed now than before the war, is probably no better off in relation to industry than in the later 1920's.

Moreover, in the war-damaged countries of Europe, farmers' prosperity has been somewhat illusory. During and immediately after the war, farmers were buying very little because very little was available; also, they were allowing their land, their buildings, and their livestock to deteriorate and would have to spend heavily on rehabilitating them at some later date. The same was true of fishermen, whose craft and gear deteriorated during the war. In consequence, their surplus of income over expenditure looked better than it was. In the past two years, as farm requisites and fishing gear have become more readily available, net incomes of European farmers and fishermen have been falling back toward the prewar level.

International Trade

Some data on changes in international trade are shown in Table 9. World exports of food have declined only a little as compared with prewar because the drastic reduction in exports from the Far Eastern and European countries has been almost matched by the huge expansion of North American exports. However, the decline in the world total would be greater if data for food-exporting countries other than the 53 included here could be presented, since exports have fallen substantially from several of these other territories in the Far East, Africa, Central America, and the Caribbean. In all the continental groups except North America, food exports have declined proportionately more than food production; in other words, people in most exporting countries are retaining a larger share for their own use.

Food imports have been curtailed in the Far East, Europe, and—which is not so generally realized—in North America. The increased imports of Latin America and Oceania, although large by reference to prewar, are small in absolute quantities. Chart IV shows the food exports of the 53 countries grouped by continents and valued at prewar prices. Some figures of absolute quantities traded in selected products are given in Part III.

The fall in fiber exports shown in Table 9 reflects chiefly the decline in exports of cotton, silk, and hard fibers. International trade in forest products, which before the war was primarily an intra-European activity, has been greatly curtailed in that continent, but has expanded in the Western Hemisphere.

Table 10 shows the changing shares of the various continents in world trade in food, fibers, and forest products. The share of the Western Hemisphere in the 53 countries' food exports has risen from 40 to 70 percent, and in the world's lumber exports from 36 to 61 percent. It is this violent shift in sources of supply which constitutes food and agriculture's share of the dollar problem.

Chart IV

INTERNATIONAL TRADE IN FOOD OF 53 COUNTRIES

(Thousand Million Gold Francs)

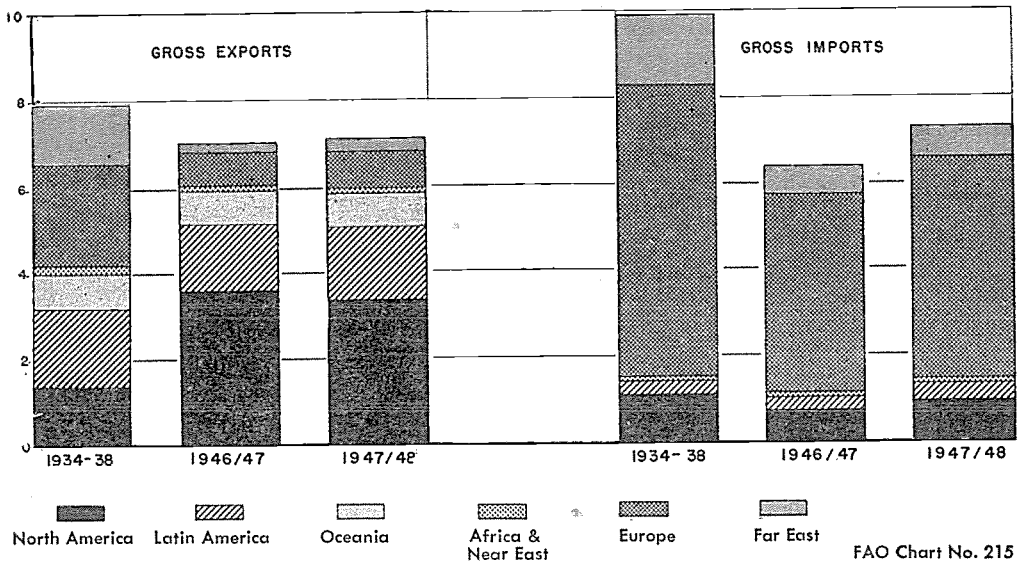


TABLE 9.—INDEX NUMBERS OF VOLUME OF INTERNATIONAL TRADE IN FOOD, FIBERS, AND FOREST PRODUCTS IN 1946/47 AND 1947/48 [1]

Area	Food [2]				Fibers [3]		Forest Products [4]			
	Exports		Imports		Exports		Exports		Imports	
	1946/47	1947/48	1946/47	1947/48	1946/47	1947/48	1946	1947	1946	1947
	(.... *Index: 1934–38=100* ....)				(*1934–38 = 100*)		(.. *Index: 1937=100* ..)			
Far East	15	23	35	43	31	53	3	4	23	26
Europe (excl. U. S. S. R.)	31	38	70	80	50	50	46	50	41	47
United States and Canada	[5] 257	[5] 236	[5] 83	[5] 87	67	40	115	133	[6] 103	[6] 119
Latin America	88	98	103	145	126	120	145	145	105	104
Australia and New Zealand [7]	68	116	80	127	147	122	23	31	51	56
Africa and Near East	...	...	...	...	97	93	74	70	126	132
WORLD AVERAGE (excl. U. S. S. R.)	89	90	67	75	76	73	70	79	62	71

[1] Figures for 1947/48 are very provisional.
[2] Index numbers compiled in same manner as those of production and consumption. See the Appendix.
[3] Index numbers on tonnage basis. Includes *total* exports of cotton, silk, jute, abaca, sisal and henequen, but wool exports (actual weight) only from five chief exporting countries accounting for about 85 percent of world wool exports.
[4] Index numbers were constructed on the assumption that a standard of sawn lumber (4.672 m^3) is roughly equivalent in value to one metric ton of wood pulp.
[5] Base period is 1935–39.
[6] Includes Mexico.
[7] For food items the base period in Australia is 1936/37–38/39; in New Zealand, 1935–39.

TABLE 10.—CONTINENTAL SHARES IN INTERNATIONAL TRADE IN FOOD, FIBERS, AND FOREST PRODUCTS, PREWAR AND POSTWAR

Area	Food				Fibers		Forest Products			
	Exports		Imports		Exports		Exports		Imports	
	1934–38	1947/48	1934–38	1947/48	1934–38	1947/48	1937	1947	1937	1947
	(..... *Percentage* .....)									
Far East	18	4	17	9	36	26	3	0.1	7	3
Europe (excl. U. S. S. R.)	30	13	70	71	0	0	61	39	55	36
United States and Canada	18	46	10	12	23	13	35	60	29	49
Latin America	22	24	3	5	13	21	1	1	5	7
Australia and New Zealand	10	11	0	0	10	17	0	0	3	2
Africa and Near East	[1] 2	[1] 2	[1] 1	+3	18	23	0	0	1	3
WORLD AVERAGE (excl. U. S. S. R.)	100	100	100	100	100	100	100	100	100	100

NOTE: This table is constructed from the same material as Table 9; the notes appended to that table apply to this one.
[1] These figures are entered for completeness but they are not representative of the two regions; as explained in the Appendix, adequate data are lacking.

The changes in trade relationships can be looked at from another point of view, namely changes in the *direction* of trade. Tables 11 and 12 show changes in the direction of trade for a broader list of agricultural commodities than those covered under "food" in Tables 9 and 10; they also reflect the effect of price changes which have taken place since the prewar period.

TABLE 11.—PERCENTAGE DISTRIBUTION OF EXPORTS OF SELECTED AGRICULTURAL PRODUCTS BY CONTINENTS AND THE UNITED STATES, 1937 AND 1947

Exported to:	Year	Exporting Countries						
		Europe	United States	Other Western Hemisphere	Asia	Africa	Oceania	All Exporting Countries
		(*Percentage of total exports*)						
Europe	1937	85.3	67.0	59.8	37.8	69.7	75.3	58.9
	1947	91.2	62.5	38.9	40.1	49.3	63.7	50.0
United States	1937	4.5	0.0	27.6	21.3	7.8	5.7	16.1
	1947	1.9	....	38.9	31.9	10.9	16.9	22.6
Other Western Hemisphere	1937	2.3	13.1	6.3	1.8	1.8	1.2	4.2
	1947	0.5	18.9	5.9	7.5	0.5	1.7	8.4
Asia	1937	0.2	15.4	2.2	26.6	8.5	8.9	12.4
	1947	0.3	14.8	2.6	4.8	14.2	8.9	7.4
Africa	1937	0.9	0.4	0.5	3.2	0.7	0.4	1.3
	1947	0.5	1.5	1.3	3.3	1.1	1.6	1.7
Oceania	1937	0.1	0.1	0.0	1.5	0.2	0.2	0.5
	1947	0.0	0.1	0.2	3.9	0.0	0.9	1.0
Others not specified	1937	6.7	4.0	3.6	7.8	11.3	8.3	6.6
	1947	5.6	2.2	12.2	8.5	24.0	6.3	8.9
TOTAL EXPORTS	1937	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1947	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTE: Footnotes for Tables 11 and 12 are combined under Table 12.

Thus it is evident that Asia before the war obtained 65 percent of its imports of the group of commodities dealt with in the tables from other Asian countries, whereas in 1947 the proportion was only 13 percent. Asia's imports from the United States increased in the same period from 13 to 49 percent of its total imports. Africa before the war obtained 73 percent of its imports from Asia, and in 1947, 37 percent. Its imports from the Western Hemisphere in this period rose from 13 percent to 48 percent of its total imports. On the export side, Western Hemisphere countries other than the United States sent 60 percent of their exports to Europe in 1937, but only 39 percent in 1947. Between the same dates the proportion of their exports going to the United States rose from 28 to 39 percent.

Postwar developments in the international trade in foodstuffs are indicative of developments in total trade. There is a large demand in war-damaged countries for goods of all kinds, both for reconstruction and for consumption. These are the countries which, because of damage to their industries and loss of other earning power, find it difficult to pay. There is also a strong demand for goods in Africa and Oceania, where imports were interrupted during the war, and in Latin America, where processes of industrialization are giving rise to new wants. North America has become the major source of supply for industrial and agricultural equipment in the same way as it has for food. This again means that importers have to find dollars. Moreover, it has secondary effects. Suppose that some Latin-American or southeast Asian importer fails to get some needed machinery in Europe and is obliged to purchase it from the United States; he then has to acquire dollars for his exports of foods to Europe. This state of affairs will continue until other alternative sources of supply can be established.

TABLE 12.—PERCENTAGE DISTRIBUTION OF IMPORTS OF SELECTED AGRICULTURAL PRODUCTS BY CONTINENTS AND THE UNITED STATES, 1937 AND 1947

Imported from:	Year	Importing Countries							
		Europe	United States	Other Western Hemisphere	Asia	Africa	Oceania	Others Not Specified	World
		(*Percentage of total imports*)							
Europe	1937	11.2	2.1	4.2	0.1	5.1	2.0	7.9	7.8
	1947	5.8	0.3	0.2	0.1	0.9	0.0	2.0	3.2
United States	1937	12.0	.....	32.8	13.1	3.1	2.5	6.5	10.5
	1947	30.6	.....	55.0	49.0	21.8	3.8	5.9	24.4
Other Western Hemisphere	1937	28.3	47.9	41.5	5.0	9.8	1.6	15.4	27.9
	1947	27.4	60.7	24.8	12.3	25.9	8.0	48.5	35.3
Asia	1937	19.4	40.3	13.4	65.2	72.8	84.6	36.1	30.3
	1947	15.7	27.6	17.4	12.8	37.4	77.8	18.6	19.6
Africa	1937	11.6	4.8	4.3	6.7	5.1	4.0	16.9	9.8
	1947	6.3	3.1	0.4	12.3	4.0	0.0	17.1	6.4
Oceania	1937	17.5	4.9	3.8	9.9	4.1	5.3	17.2	13.7
	1947	14.2	8.3	2.2	13.5	10.0	10.4	7.9	11.1
TOTAL IMPORTS	1937	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1947	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTE.—Footnotes applying to Tables 11 and 12 follow:

As a representative sample, foodstuffs and agricultural products were taken whose value in world exports in 1938 amounted to more than 100 million dollars (League of Nations, *The Network of World Trade*, Geneva, 1942, p. 30) plus the six oilseeds and eight vegetable oils whose aggregate value also was over 100 million dollars (*Ibid*, p. 34). The list of commodities covered was:

Wheat and wheat flour	Meats	Citrus fruits (lemons and oranges)	6 Oilseeds (linseed, peanut, palm kernels, copra, soybean, cottonseed)
Barley	Coffee	Wool	
Maize	Tea	Cotton	8 Vegetable oils (olive, linseed, peanut, palm, palm kernel, coconut, soybean, cottonseed)
Sugar	Cocoa	Rubber	
Butter	Rice		

The combined export value of these commodities amounted to 68 percent of the combined world exports of foodstuffs (Brussels Classifications I and II of International Trade Statistics), oilseeds, wool, cotton, and rubber.

For each commodity the countries were selected which were major exporters in 1938 or after the war. A total of 45 exporting countries was covered. For each of these exporting countries data on volume and value of exports by destination for the commodities selected were collected from national statistics; in some cases unpublished material was made available also. All countries importing more than 1 percent of total exports of a specific commodity were listed. In a few cases, where destination was available only by volume, a distribution by value was estimated by applying unit values; where no breakdown by destination was given at all, volume figures of imports from the main importers were taken. This method covered 75–95 percent of world trade in each of the commodities.

The national trade value figures were converted into United States dollars, the exchange rates used being the buying rates as published in *International Financial Statistics* by the International Monetary Fund or an average thereof where multiple rates were listed. In many cases where exports by commodities and destination were not available for 1947, 1946 data were utilized and the comparison is, therefore, rather between a particular prewar year (1937) and a postwar period based on 1946 or 1947 figures.

Another problem facing importing countries is the change in terms of trade; that is, in the quantity of exports which they have to give in exchange for a given quantity of food imports. It is difficult to get a satisfactory measure of change in relative prices, and no concept is entirely unexceptionable, but the figures in Table 13 do indicate approximately the position in the United States and the United Kingdom.

TABLE 13.—TERMS OF TRADE FOR FOODSTUFFS: UNITED STATES AND UNITED KINGDOM

Year and Month	United States			United Kingdom		
	Prices of Imports of Foodstuffs [1]	Prices of Exports of Finished Manufactures [2]	Ratio of Import/Export Prices	Prices of Imports of Food, Drink, Tobacco [3]	Prices of Exports of Manufactures [3]	Ratio of Import/Export Prices
	(*Index: 1938=100*)					
1938	100	100	100	100	100	100
1939	98	99	99	123	106	116
1940	96	107	90	146	136	107
1941	112	110	102	152	151	101
1942	150	137	109	167	180	93
1943	164	151	109	172	195	88
1944	198	178	111	181	199	91
1945	194	176	110	195	195	100
1946	230	154	149	220	210	105
1947	306	182	168	243	245	99
1948						
January	356	191	186	249	244	102
February	340	196	173	254	247	103
March	342	191	179	255	248	103
April	338	193	175	259	251	103
May	332	191	174	.....	.....	.....

SOURCE: United States figures—U. S. Department of Commerce, *Statistical Abstract of the United States* and the *Monthly Summary of Foreign Commerce of the United States*, Washington, D. C.; United Kingdom figures—H. M. Stationery Office, *Monthly Digest of Statistics*, London.

[1] Unit values reflecting f. o. b. prices; yearly (monthly) averages of crude and manufactured foodstuffs weighted by percentage share in total imports.

[2] Unit values, yearly (monthly) averages, reflecting f. o. b. prices.

[3] Export (import) prices, end of December figures; unit values of c. i. f. import and f. o. b. export prices.

The terms of trade have turned strongly against the United States as a food importer since 1946, whereas they have hardly changed at all in the United Kingdom. Some partial explanation may be that the United States imports largely specialty and manufactured foodstuffs which have increased steeply in price, whereas the United Kingdom imports primarily staple foodstuffs and has shifted somewhat to cheaper items. The procedures of international allocation have moderated the intensity of competition for several staple foods and so moderated the price rises. Also the United Kingdom, through its system of long-term contracts, has been able to obtain comparatively low prices in exchange for a guaranteed market. It should be added that food is the most favorably priced element in the United Kingdom's imports. The prices of raw materials have risen much more steeply, and the terms of trade of all imports against all exports have for the United Kingdom become very unfavorable.

Probably the terms of trade in food for other importers would lie between the two extremes exemplified by the United States and the United Kingdom.

As regards the future trend in terms of trade, divergent views are held. World food prices must sooner or later decline somewhat from present high levels—some decline in wheat, sugar, and cotton has already taken place—but so, also, will the prices of things which Europe exports (and the terms of trade are primarily a European problem). The question is whether food prices are likely to fall further and faster than the prices of manufactures, but this is bound up with other longer-run issues which must now be considered.

Chapter 3

THE NEXT THREE YEARS

The Outlook for 1948/49

THE world food situation will be substantially better in 1948/49. The Northern Hemisphere, which includes most of the food-importing countries, is harvesting excellent crops of cereals. Not only will the deficit countries themselves have good crops, but there will be the largest world export surplus of grain since 1930/31, amounting to 38 million metric tons as compared with 35 million last year and 29 million the year before. Rice exports will be larger from each of the three chief exporting countries—Burma, Siam, and Indo-China—and the rice harvest is reported to promise well in the major importing countries, except China, where there has been extensive flood damage. For sugar, the European outlook is much better than last year; and although the United States crop will be reduced, the recent Cuban harvest was an all-time record.

Supplies of fats and oils will show some further improvement, although recovery for these items proceeds much more slowly than for other staple foods, partly because the output of animal fats cannot recover quickly and partly because the export of oilseeds, especially from Asia, seems to be permanently reduced. Recovery of the livestock industry, which in Europe suffered a setback last year, should be resumed, although the more favorable supply of feed grains will show little result, except in milk output, until 1949/50. In the United States this year's record maize crop will likewise produce substantially more meat in 1949/50.

As regards fish, there will be more fishing units out at work, both in the Northern Hemisphere fisheries and in Antarctic whaling. The size of the fish catch will depend on the chances of next winter's season, while the whale catch will probably reach the limit set by the International Whaling Convention.

World fibers plantings to be harvested in 1948/49 will be appreciably larger than in the previous season, owing to the stimulus of favorable prices, the relaxation of crop area controls in some countries, and the continuation of development programs in others. An exceptionally large cotton crop is about to be harvested in the United States, but no major change is anticipated in the world production of wool and other animal fibers. Textile manufacturing activity will continue high in Europe, with the exception of the United Kingdom and Germany; in India and Japan it should show some improvement but will still be below prewar, and in the United States it will remain high in harmony with the general level of economic activity.

The outlook for the supply of forest products is likely to show no appreciable change from 1947/48. High prices and the arrangements made by the FAO/ECE Timber Com-

mittee limit the purchases of European importers to the quantities actually available. Some reduction in the United States pulp purchases from Scandinavia should make more pulp available for other parts of Europe.

The world will continue to rely overwhelmingly upon the Western Hemisphere for the bulk of its food imports and for an important part of its imports of fibers and lumber products. However, the European Recovery Program will make the financing of this trade far easier than it would otherwise have been, not only for those countries benefiting directly from United States aid, but for many outside its scope.

Later Trends

It is difficult to appraise trends in world supplies beyond 1948/49 with any confidence. Although governments were asked to report to FAO their prospects for 1949/50, only a few have done so, and the information at present available refers mainly to North America, Oceania, and Europe, and, in respect to rice, the Far East. Projections for North America and Oceania refer to 1949/50, whereas those made in FAO's report on Europe [1] refer to 1950/51.

According to these programs, Europe will in 1950/51 still be a heavy importer of food, taking for example 26 million metric tons of cereals, equivalent to 1947 imports. It will not yet have been able to switch its purchases to any great extent to the non-dollar sources of supply. In North America, internal food consumption will continue at a high level, and many authorities anticipate some shifts in production which might mean reduced food exports. If, on the other hand, farmers continue to be stimulated by favorable prices, production of export crops may remain close to present levels. In Asia, although no definite information is available, some of the worst dislocated countries, such as Indonesia, Indo-China, and Korea, may have largely rehabilitated their agriculture by 1950/51. Also China, India, and some other countries have programs for expanding production. It is not clear from the available evidence, however, whether these programs will or will not do more than keep pace with the growth of population. In Africa and Latin America the present slightly improved level of food consumption may be maintained; Africa's exports of food may recover to prewar levels, but the export outlook in Latin America is less sure.

As regards fibers no reliable programs are presently available, the plans of the European co-operating countries having been drastically modified. The outlook for cotton crops remains quite conjectural; but wool production may continue at about present levels, with the hard fibers gradually increasing. Textile manufacturing activity may continue to expand in Europe, textiles being one of the most promising types of export product in the short run. India may inherit, for a time at least, some of the former Japanese textile export markets.

In lumber the shortage may well be intensified by 1951 unless the cessation of overcutting in Europe, which has to be expected sooner or later, is largely compensated for by expansion of exports from the U.S.S.R. and elsewhere. The use of pulp and paper is growing so rapidly that all demands probably cannot be satisfied.

The general outlook is for the restoration by 1950 or shortly thereafter of something nearly approaching prewar food consumption levels in most of Europe and the Far East, provided that no markedly unfavorable weather intervenes. The prospects are similar for fibers and forest products. Food consumption will continue high in North America and

[1] FAO, *European Programs of Agricultural Reconstruction and Development,* Geneva, June 1948.

Oceania. By contrast, in most of the low-income countries the production programs as at present formulated do not seem to envisage any significant improvement over the prewar level in the food supplies available *per person.* It is, of course, natural that low-income countries which suffered war damage should be preoccupied with restoring their prewar living standards. But even some of these countries, and certainly countries not disrupted by the war, should by now be setting themselves targets for food supplies which would bring about the beginnings of an increase in living standards over and above the very unsatisfactory prewar level. The same consideration would apply to consumption targets for fibers and forest products. That there are few present indications of the existence of such targets and programs is indeed disquieting.

Chapter 4

CONSUMPTION GOALS

WHAT standards of consumption should be set as the objective policy? Should the aim be merely to maintain the present standards, or should we contemplate a return to prewar standards, or should the goal be something better than prewar and, if so, what?

In 1946 FAO set up some provisional nutritional targets. These were based on quantitative principles—a minimum energy value in calories per person per day—and on qualitative principles—certain minimum quantities of high-quality protein and of vitamin- and mineral-bearing foodstuffs. The targets were adjusted to take account of regional differences in consumption habits and production possibilities.

To achieve these targets in some of the worst fed countries would require an increase in per caput food supply of about 40 percent[1]. This, however, takes no account of increase in population. The population of the underdeveloped countries is expanding at about 1.5 percent per annum. Thus, to reach the nutritional targets within, say, 25 years, it would be necessary to expand food supplies in these areas by something like 100 percent.

Further, an estimate was made of the approximate percentage increases over prewar food supplies required for all 70 countries covered in the *World Food Survey,* assuming that the nutritional targets were reached by 1960 and that world population had risen 25 percent above prewar at that date. These increases were as follows:

TABLE 14.—PERCENTAGE INCREASES OVER PREWAR FOOD SUPPLIES TO MEET 1960 REQUIREMENTS

Commodity	*Percentage*
Cereals	21
Roots and tubers	27
Sugar	12
Fats	34
Pulses	80
Fruits and vegetables	163
Meat	46
Milk	100

As was stated in the Survey, "This estimate gives some idea of the magnitude of the task to be undertaken and the opportunities ahead for food producers, as the nations set out to improve nutrition on a world scale."

In 1947 FAO set up some provisional standards of consumption for apparel fibers, mainly cotton, wool, and rayon.[2] Two alternative standards were set, one based on the

[1] For the basis of this calculation, see FAO, *World Food Survey,* Washington, U.S.A., 1946, pp. 11-20.

[2] FAO, *World Fiber Survey,* Washington, U.S.A., August, 1947.

prewar Italian consumption level of 3.9 kilograms per person per annum and the other based on 50 percent of the prewar United States consumption, which would be 6.6 kilograms per person per annum. World output of these fibers would have to be increased by 60 percent over prewar in order to reach the lower level of consumption by 1960, and by 130 percent to achieve the higher level.

For forest products, the establishment of goals is somewhat more complicated. At the present time, more than one-half the world's output of wood is used for fuel, a use which may diminish with the progress of economic development. The average 1946 consumption of wood for all industrial purposes (i.e., all non-fuel uses) was about 200 kilograms per person per year, but in Canada it was 1,400 kilograms. In order to increase world per caput consumption by 1960 up to 1 cubic meter of wood, or about 700 kilograms, of which one-half would be industrial wood, the output of industrial wood would need to be doubled and the output of wood as a whole (assuming that fuelwood use increased in some regions but diminished in others) raised just over 85 percent compared with 1946. The world's per caput consumption of industrial wood would then, incidentally, be equal to 25 percent of the Canadian consumption level.

How could such goals be attained? Two methods have principally to be used—one is to secure better distribution of available food supplies (also fibers and forest products) between the various income groups in an individual country; the other is to raise the real output (and income) of the whole country and, insofar as the extra supplies are imported, to ensure that the importing country is able to export other goods to pay for the food needed. The scope for the first method lies principally in the advanced high-income countries, notably the United States, Canada, Oceania, the countries of northwest Europe, and Argentina. In these the available supplies would be sufficient, or very nearly so, for everyone to have the necessary minimum, provided that distribution were made in accordance with need. But in countries where almost all groups are low-income groups, the scope for redistribution is small; the overwhelming problem is to raise the real productivity and income of the entire community. This is essentially the situation in Asia, Africa, and Latin America.

The distribution of available food supplies to get the greatest nutritional benefit implies the adoption of a wide variety of special measures. Examples of most of these are already to be found in the food and nutrition policy of one or other of the advanced countries. They include feeding programs for children, child-bearing women, and special classes of workers; the regulation of food processing and preserving to ensure the best conservation of the nutritive elements; instruction in the home as to better ways of preparing and cooking food; subsidization of prices of selected foodstuffs; popularization of new foods; and wide dissemination of nutritional knowledge by propaganda and education. Indirect aids may come from family allowances, unemployment insurance, and other elements in social security programs.

Raising the level of real income in low-income countries implies vigorous but balanced development of agriculture and of industry. The reasons for balanced development were set forth clearly in the Report of the FAO Preparatory Commission on World Food Proposals.[3] Industry must expand to provide consumer goods and the means of production which farmers need; to provide productive work, not only in cities but in small-scale rural industries for the surplus rural population; and to provide a wide range

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[3] FAO, *Report of the FAO Preparatory Commission on World Food Proposals,* Washington, U.S.A., February 1947.

of products for export. Agriculture must expand to provide food for the growing industrial population and also in some regions to provide certain products for export and to raise the productivity and prosperity of the farm people. Both agriculture and industry require improved general economic conditions, such as better communications and better education and health services if they are to make rapid progress.

It is not easy for a low-income country to advance on all these fronts. The limiting factor is investment. The amounts that can be spared each year from current consumption are very small when income per person is small. Hence investment priorities have to be established. In short, an agricultural program needs to be part of a general economic development program.

The over-all objective is to raise real incomes, for otherwise the consumption goals cannot be realized. A given level of food consumption is a direct function of a certain level of income. Although studies in this direction are in their infancy, it can be roughly estimated that an increase of 40 percent in per caput food expenditure in a low-income country would normally be associated with an increase of 40 to 50 percent in real income. To bring per caput consumption of apparel fibers in China to the Italian level would require an increase of approximately 140 percent in real income; while for India the corresponding figure would be 65 percent.[4] There is here a job of economic engineering—to increase real income per person in the low-income countries by at least 50 percent in a comparatively short period of time and, in doing so, to maintain a balance between industry and agriculture appropriate to the country in question.

[4] FAO, *World Fiber Survey*, p. 18.

Chapter 5

THE BATTLE FOR AGRICULTURAL PRODUCTION

THE basic question is whether agriculture could play its part in such an enterprise. Could food (and fiber and forest) production be expanded at the necessary speed? This leads immediately to a consideration of the fundamental problems of agricultural development—soil fertility, water supplies, improved crop and animal husbandry, economic incentives, and so on. These big problems have been stated, debated, and restated in many places and at many times.[1] The reasons for briefly summarizing them here again are that (a) on the evidence of national food and agriculture programs it appears that many governments have not given these problems sufficiently serious attention in the light of the world's food needs, and (b) the nature of the problems must be kept clearly in mind in order to judge what next steps should be taken to deal with them.

Soil Erosion

The basis of food production is the productive soil of the world, and it is limited in amount. Each year it decreases in quantity and also in quality, through continued use of traditionally bad husbandry practices. There are some who say that in certain countries agriculture has for centuries been living on its capital, so to speak. It has exhausted without replacing the fertility of the soil. The latest chapter of this story was written in the new lands settled during the past hundred years, where millions of tons of good soil are each year blown or washed into the sea. As a consequence, the world's food output is in danger. Moreover, any benefits through technical progress in other directions are partially lost until nations (1) halt or greatly diminish soil wastage; (2) apply conservation practices to soil subject to loss through use; and (3) protect forest soils as a means of protecting cropped soils. In this connection reforestation has a big part to play in the eroded regions, pinning down the soil and helping it to regain fertility.

A vast amount of valuable work on soil erosion has already been done, notably in the United States. In many other countries, however, achievement is limited by lack of trained staff, equipment, or funds, rather than by lack of interest. It is of prime importance to discourage the cultivation of land which is unsuitable for cropping and to eliminate as rapidly as possible the practice of shifting cultivation on leachable soils.

The nations are faced here with an issue which cannot be neglected and which cannot be dealt with by the present technical resources of many of the countries where erosion is most serious. The loss of soil concerns the whole of mankind, and it is in the in-

[1] In this context FAO has during the past year issued a number of publications covering specific technical problems.

terest of those countries with more experience and resources to put their facilities at the disposal of the less developed countries.

Technical Efficiency

Compared with the less developed countries of the world, the most advanced countries have a far higher output per farm worker, obtain four times as much milk per cow, and in areas of dense population and intensive farming can obtain four times as much grain per hectare. Technical improvement takes many forms. One aspect of basic importance is water control, to ensure that the cropland has the right quantities of water at the right seasons. Major irrigation and drainage projects involve elaborate and costly surveys and the construction work is essentially a long-term proposition. There are considerable areas of semi-arid land, particularly in Asia, Africa, and Latin America, which could become highly productive by proper regulation of water that could be made available.

Another field of activity is the improvement of crops. The use of improved seed, whether pure seed of current varieties or new seed of hybrid varieties, is one of the best methods of obtaining better yields and returns within a reasonable period. The multiplication of seed and its effective distribution to farmers requires well-organized programs not yet initiated in many countries. Similarly, the attack on crop pests and diseases requires considerable technique, staff, equipment, and supply of chemicals, all of these being scarce items in underdeveloped countries. There is a need now in many countries for plant health to become, like human and animal health, an integral part of a comprehensive public health service.

Another front on which to attack is the improvement of livestock. The principal methods are: more widespread adoption of artificial insemination practices; closer study of animal nutrition; improvement of feed supplies, in particular the improvement of pasture management (under favorable circumstances one hectare of grass can yield more animal feed than one hectare of grain); and, finally, the control of animal pests and diseases through immunization and other methods of hygiene.

Another method is the wider use of fertilizers. In Chapter 16 are discussed the current large consumption of fertilizers in Europe, the United States, and Canada, and also the beginnings of a demand for fertilizers in other continents. The quantities used in the low-income countries, however, are insignificant as yet.

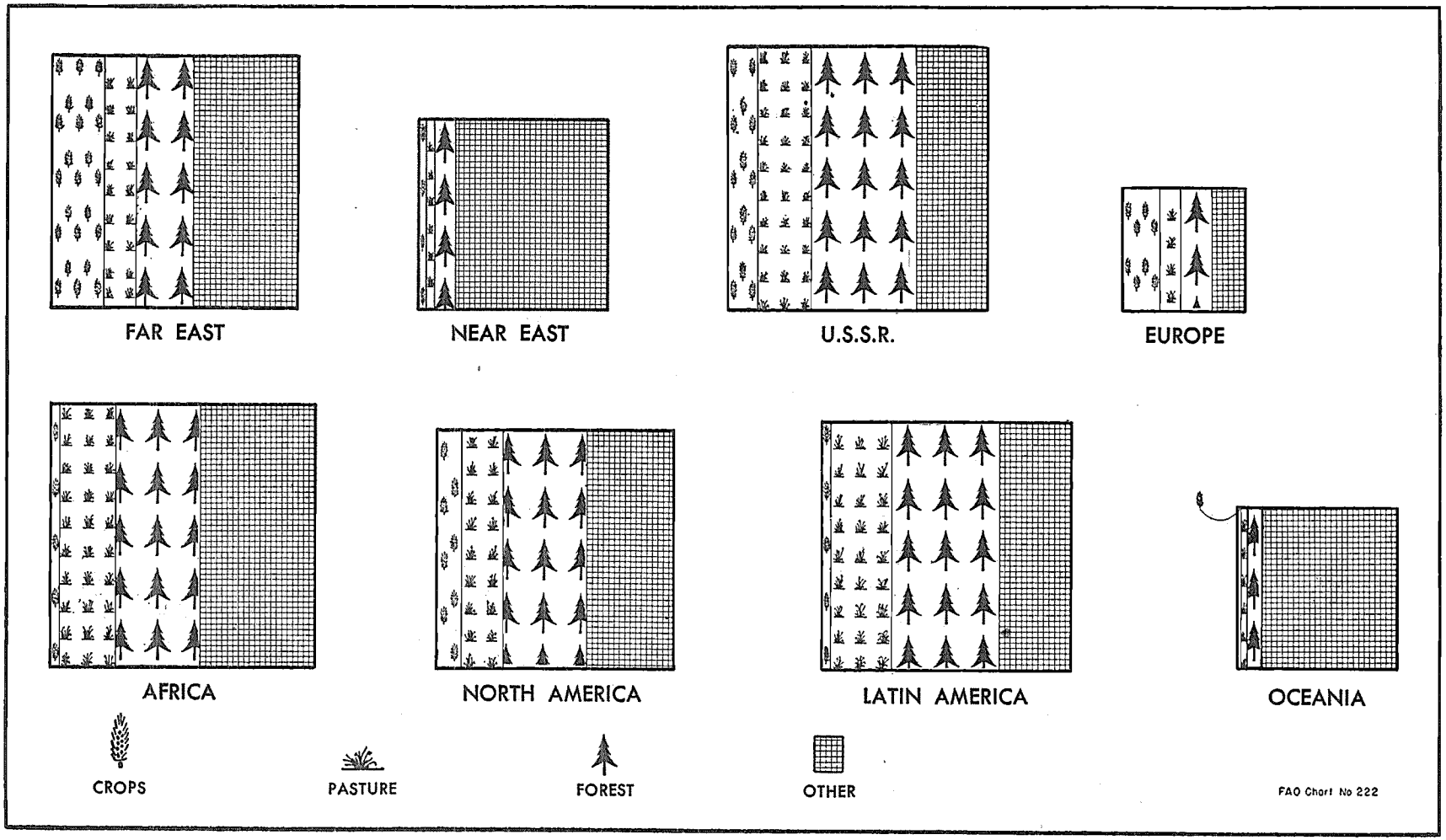
Still another technique is the introduction of more farm machinery (see Chapter 17), which, besides ensuring better cultivation of the soil, releases for human food production the land which formerly grew crops to feed draft animals. In the United States alone 22 million hectares of cropland have been won in this way for additional human food production.

But the world today faces an equipment shortage—a bottleneck in the supply of fertilizers, machinery, and pesticides. The difficulties in procurement of these items are currently under consideration by intergovernmental working parties in Europe, in Asia, and in Latin America, meeting under the joint auspices of FAO and the Regional Economic Commissions concerned. The problem is a dual one; first, to satisfy the needs of the advanced countries, which at present consume most of the available supplies and could consume more; and, second, to obtain supplies for the underdeveloped countries, which are not as yet producing these items on a substantial scale and which lack the funds to import large quantities.

Taken together, these various lines of advance in technical efficiency—water supplies,

Chart V

LAND UTILIZATION

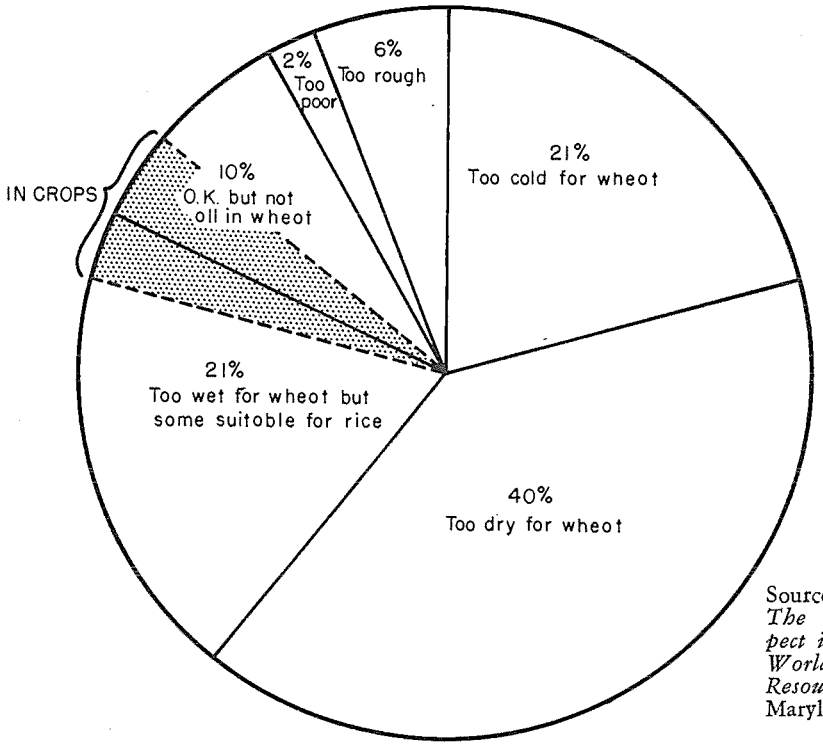


crop improvement, livestock improvement, use of fertilizers and farm machinery, and many other techniques that might be mentioned, including better forest management—could bring about substantial gains in output per hectare in many parts of the world. Indeed, as the recent history of wheat suggests (see Chapter 12), it may be that we are passing from the era of cropland expansion into an era of yield improvement. During the past century the increase in the food supply of the Western World was obtained mainly by bringing new land into use—first the enclosure of common land in Europe, later the settlement of North America, and last the opening up of Argentina, Australia, and New Zealand. Some of the people were brought to the food; some of the food was brought to the people remaining in the Old World. In the process of settling the new continents the easier land was cultivated first—the flat land, the land with good rainfall and moderate temperatures, the land close to waterways or to the newly built railways. Today both economic and technical factors have combined to make it more advantageous for the New World to begin doing what Europe has been doing since the beginning of the nineteenth century, namely increasing yields. And not only in the New World, but also in the densely populated parts of the Old World, notably the Far East, must the major emphasis be on yield.

Cultivating New Land

Although in most regions the best and most rapid results could probably be obtained by improving farm practice on land already in cultivation, it is worth examining whether and to what extent further new land could be brought into use. Despite all the emigration and settlement of the past century, man is today cultivating only about 8 percent of

Chart VI
CHARACTERISTICS OF THE EARTH'S LAND AREA



Source.—O. E. Baker, *The Population Prospect in Relation to the World's Agricultural Resources,* University of Maryland, 1947

FAO Chart No. 219

the world's surface. What are the possibilities of adding something to this 8 percent? According to one estimate (see Chart VI) some 40 percent of the earth's surface is reckoned too dry for wheat and 21 percent too cold; another 21 percent is too wet, but of this area some part would be suitable for rice and other tropical crops.

The situation differs widely from continent to continent. As Chart V shows, some 40 percent of Europe's land area is under crops. In Latin America the proportion is 3 percent; and in the Near East, largely an area of deserts, only 1 percent. The world needs to know what the scope might be for cultivating additional land, particularly in Africa and Latin America, where population pressure has not been such as to exhaust the possibilities to the same extent as in Europe and in many parts of the Far and Near East. Would it be possible to bring into agricultural use, say, another 3 percent of the uncultivated areas of Africa and Latin America? If so, that would nearly double the crop area of those continents. There is conflicting opinion and little knowledge as to how expensive this would be in terms of clearing bush, draining swamps, regulating the courses of rivers, and reforesting areas which have for centuries been denuded and subject to soil erosion. It is desirable for the countries concerned to inquire into the practicability and cost of such measures.

Similarly, what could be done to bring into use that part of the world's forest area which is at present unproductive or inaccessible, or both? Only two-thirds of the world's so-called "forested areas" could be classed as productive, the rest being scrub, bush, or tundra. Of the productive area only 54 percent is accessible and actually in use.[2]

How far could that proportion be increased? Here is virtually a new continent, the unused forest, equal in area to the whole of Asia (excluding the U. S. S. R.), which remains to be explored and used for human benefit. These forests could contribute not only fuel and lumber but also, by chemical transformation, pulp, plastics, sugar, ethyl alcohol, yeast, and fodder cellulose. It may be that in time they will provide a large proportion of the world's clothing materials and animal feeding stuffs, thus releasing important areas of cropland for food crops. There may be here, as there is in soil conservation, an important inter-relationship between forest policy and agricultural policy.

The world's fishery resources are likewise only partially developed. The great bulk of the world's fish supply is at present caught in relatively small areas of the North Atlantic and North Pacific. The waters around Africa, Latin America, and South Asia have yet to be investigated to ascertain their yield capacity. Nor should the development of new freshwater fisheries be overlooked, especially in connection with irrigation projects.

In none of these directions, whether it be the opening up of new lands, of new

[2] The following figures indicate the approximate position in each of the continents.

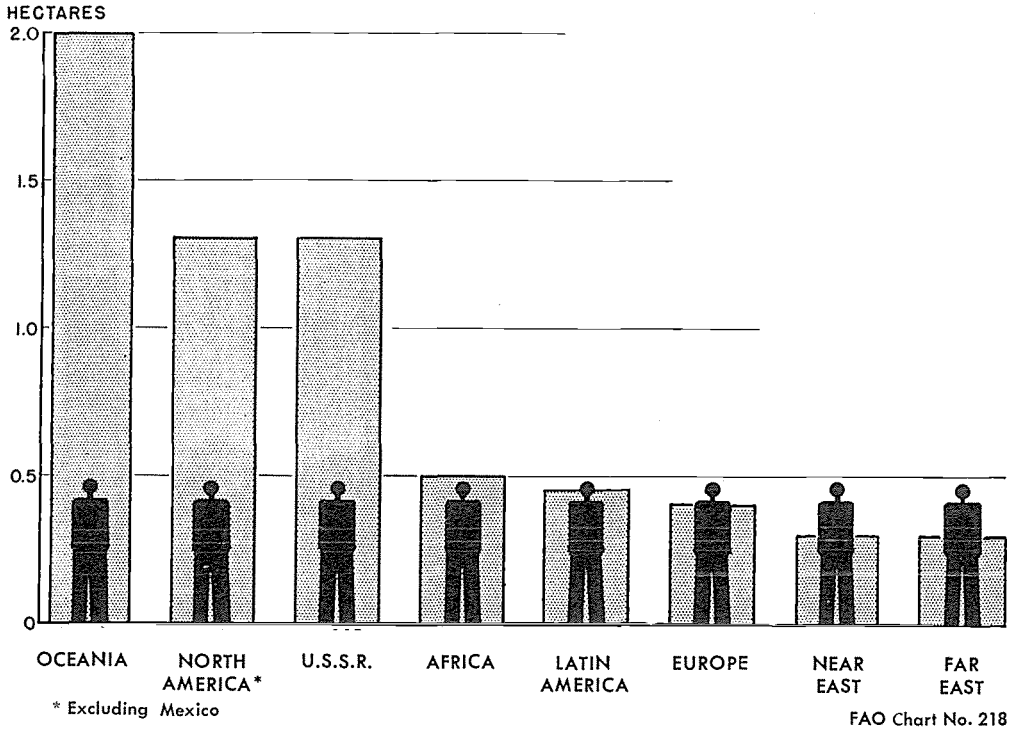
FORESTED AREAS AND PRODUCTIVE FORESTS OF THE WORLD

Region	Forested Area			Accessible Productive Forests	Area per caput		Proportion of Conifers [1]
	Productive	Other	Total		Productive	Accessible Productive	
	(*Million hectares*)				(*Hectares*)		(*Percentage*)
Far East	335	154	489	168	0.3	0.15	21.6
Europe (excl. U. S. S. R.)	117	9	126	114	0.3	0.3	58.0
North America	457	203	660	299	3.0	1.96	68.0
Latin America [2]	714	109	823	342	4.7	2.2	3.5
Oceania	50	30	80	24	4.2	2.0	16.0
Africa [3]	302	439	741	148	2.0	0.95	0.7
Near East	27	112	139	8	0.2	0.07	5.6
U. S. S. R.	610	310	920	310	3.2	1.6	75.0
TOTAL	2,612	1,366	3,978	1,413	1.1	0.6	36.0

[1] Proportion of productive forest area. [2] Includes Mexico. [3] Except Near East countries.

Chart VII

CROPLAND PER INHABITANT OF EACH REGION



forests, or of new fisheries, have the potentialities been inquired into seriously. Yet the findings should be of particular importance in relation to the world's need for a more rapid expansion of production.

Reduction of Waste

There is no need to repeat in this Report the evidence showing what enormous losses of agricultural and forest products occur each year through preventable waste. FAO has already held meetings and published information on losses of food in storage—losses of bread grain and rice alone being estimated at 33 million tons annually. Waste can be reduced not only through improvement of storage facilities, but through replacement of handsowing by seed drills; improvement of harvesting and threshing equipment; provision of more modern transportation, including refrigerated cars where needed; rationalization of wholesale and retail distribution; and education of housewives in the preparation of food.

FAO has drawn attention to losses of wood in logging and manufacturing operations, which in the United States amount to 58 percent of total cut, aside altogether from losses in the forest through fire and diseases. This type of waste could be rapidly and substantially reduced by establishing in a large number of countries what are known as "integrated forest industries," namely a group of industries capable of using the entire output of the forest, including the trimmings and sawdust.

As regards fisheries, a considerable amount of waste is being eliminated by the construction of processing vessels in which the fish can be filleted, packed, and frozen on the high seas.

Economic Factors

If programs for increasing agricultural production are to be translated into practical action on each one of the millions of farms, it will mean for each farmer a considerable investment in improvements. In some countries farmers have access to reliable sources of agricultural credit at reasonable rates of interest, but such facilities are lacking in many of the less developed areas where the need for agricultural improvement is greatest. Also in many countries the land tenure arrangements need radical reform in order to give the farmer the security which will encourage him to develop his farm for the benefit of subsequent generations. Further, the producers need improved marketing facilities—in some countries more roads and railways, in others co-operatives and other organizations to grade and pack the food produced.

In addition to this the farmer must be assured of fair and stable prices for the products he brings to market. A number of governments already have programs of guaranteed prices for the principal farm products. This system may need to be spread further, particularly in the countries planning rapid agricultural development. If farmers are to be asked to invest in a wide variety of improvements, they must have confidence that the products which result (it may be some years after the investment was made) will fetch prices that bear a reasonable relation to the costs incurred and will not be liable to violent fluctuations. The case of the minority of farmers who produce for export markets may need to be covered by international commodity agreements, such as the draft International Wheat Agreement, or by direct agreements between pairs of governments. To stress this matter of agricultural prices at a time when world food prices stand so high may seem inappropriate, but the very height to which prices have risen makes farmers apprehensive of the depth to which they may fall, and fearful that investments undertaken now may turn out to be quite unprofitable in five or ten years' time.

Social Factors

As important as any of the issues mentioned so far is the provision of the basic social services. This is much too big a subject to be discussed here; it must be sufficient to single out by way of illustration the questions of education and health, for without the rudiments of these two services it becomes extremely difficult to spread the newer knowledge of agricultural science and of nutrition among farm families.

In many of the underdeveloped countries governments are initiating programs of general elementary education, but in most cases they are hampered by a grave deficiency of teachers, buildings, equipment, and above all, of funds. These deficiencies likewise handicap them in providing agricultural education, both in schools and through extension workers, but some countries have made effective beginnings without costly and elaborate equipment by utilizing the most progressive farmers in the villages as channels for spreading the new ideas and methods. The experience of advanced countries shows that only through extension services can rapid progress be achieved in agriculture. A sentence from the New Zealand Report to FAO may be quoted: "The present high level of production is largely due to the efficiency of the instructional services in bringing before farmers the results of research and in securing the general adoption of farm management practices evolved by the most efficient farmers." It may be noted in passing that extension services should not be linked to regulatory or commercial functions if a reputation for disinterested advice is to be established. These services should generally include provision for nutritional education in schools and in the home and for mass communication through the press, radio, and cinema.

If the importance of providing adequate agricultural services of all kinds, including research, education, extension, agricultural credit, regulatory marketing services, and statistical and marketing information services, were widely appreciated, an increased portion of the national budget would be allocated to such services in many countries. But aside from finance, an equally substantial obstacle in some countries is the shortage of trained personnel and of facilities for training. In war-damaged countries a large proportion of the personnel were directed into other occupations or the armed forces, and will not return. Countries, particularly in regions with common problems, might co-operate in developing the necessary institutions for training personnel.

In most low-income countries ill health continues to be a formidable obstacle to agricultural and to general economic development. Before the war it was estimated that nearly one third of the world's population (about 650 million people) suffered from malaria. In the decade from 1932-41, 37 percent of the people of India died from that disease or its consequences. Intestinal diseases and parasites take an additional toll; for instance, half of Egypt's population suffers from bilharzia. Ill health means reduced efficiency while people are working, and it also shortens their working life. The Indian born in 1931 had a life expectation of 26.5 years; the Englishman born in the same year, a life expectation of 61 years. This meant that prewar India spent 22.5 percent of its national income on raising children who would make hardly any contribution to production, while England spent only 6.5 percent of its national income on the raising of children.

As some evidence of the possibilities of remedial action, the prewar experience of the Netherlands Indies is worth quoting. Small pox and cholera, which had taken a heavy toll of the population, were virtually eliminated and deaths from plague were reduced by 85 percent. The main emphasis was on preventive medicine and mass innoculation.

Efforts to improve education, health, and other social services need to be considered as an indispensable counterpart of agricultural development. It is just as essential to have a school and schoolteacher to awaken the mind as it is to have fertilizer to stimulate the soil. It is just as essential to have a doctor as it is to have a veterinarian or a supply of pesticides. Indeed, a major attack upon rural conditions is a vital element in the battle of food production.

Wider Horizons

It must not be forgotten that in the research laboratories of the world work is being done which may in time radically change the whole nutritional outlook for the world's population. Already we have modern techniques of canning, pasteurizing, refrigerating, quick freezing, etc., which make it possible for human beings to have a healthy diet whether they live in mammoth cities or in remote arctic regions. Already the chemical industry is producing foodstuffs; in the United States alone 60 million dollars worth of synthetic vitamins were produced and sold in 1946. Edible fats have been synthesized from brown coal. This process might make an important contribution in the future in some countries which have large reserves of brown coal, a product which, unlike hard coal, cannot be transported far for use as fuel. Another technique is to grow plants in chemical solutions instead of in soil, and although "hydroponics," as it is called, is at present too expensive to be practical on a large scale, this may not always be the case.

Perhaps new inventions are around the corner. It may become possible to synthesize carbohydrates just as fats are now being synthesized. It may be that in the course of time atomic energy will be harnessed to industrial use so that the nightmare of population pressure could be banished and it would become comparatively easy for the large popula-

tions of the Far East to develop any range of industries they desired. One thing is certain, science does not stand still.

General Considerations

The big issues involved in agricultural development are generally familiar. The recapitulation here of their salient features does emphasize the need for heavy capital investment on almost all fronts and in almost all countries, but particularly in the low-income ones. During the past hundred years the world has been drifting along in a state of complacency about malnutrition on the one hand and neglect of agriculture on the other. As long as there was new land to bring into cultivation at small expense, it was not profitable for the individual, or indeed for countries, to invest money in maintaining soil fertility. From now on, a further large expansion of production can be obtained only if the nations are willing to invest in agriculture as they have invested in industry. To do the job, agriculture needs equipment of all kinds on a much greater scale than heretofore. It needs programs for reforestation of eroded areas, dam-building, flood control, irrigation, large-scale manufacture of fertilizers, farm machinery, and pesticides, roads and railways to make new areas accessible to markets, and technical staffs to secure the adoption of better farm practices and to fight a battle against the ill health of farm animals and farm populations. It is an investment that will yield dividends in the health and welfare of all people whether they live in cities or on farms.

The size of the investment necessary to equip agriculture for its new tasks raises other problems. Low-income countries will experience the utmost difficulty in finding sufficient money for this as well as simultaneously for industrial and general economic development. They must either borrow the capital and equipment from wealthy countries and hypothecate to others part of their future output or reduce their present low standards of living in order to provide the capital for future development. Which is to be sacrificed—tomorrow's hope for improvement, or today's meager standards?

In some recent instances an advanced country has helped an underdeveloped one with capital especially to expand the output of export crops. This method might be suitable for wider application. In other cases, as for forestry, aid has been requested from the International Bank for Reconstruction and Development.

There can be no misunderstanding or belittling of the dimensions of the production problem. Population is expanding at the rate of 1 to 2 percent per annum according to continent. Agricultural output has expanded in one country, under exceptionally favorable circumstances, at 3 percent per annum over a decade, but in many others the increase has been negligible or nonexistent. One thing is clear, namely that if a government in a low-income country wants to improve diets, and not just keep the food supply abreast of the increase in population, it will require a program which envisages an expansion of food supplies at not less than 2 percent per annum, and preferably closer to 3 percent. A food and agriculture program as ambitious as this would doubtless be extremely difficult to execute in most of the less developed countries, but must it be reckoned impossible? It is a challenge.

Moreover, in order to succeed, such a program would need to be associated with programs of full employment and rising productivity and incomes in other sectors of the economy. It would also need to be associated with a population policy, else the other programs may be brought to naught. Industrialization, judging by past experience, leads to a temporary spurt in population and does not cause the growth of population to slow down until higher standards of material wealth have been achieved. Therefore, countries should have definite population policies and aim at particular targets, relating these to the targets they establish in the various fields of economic activity.

Chapter 6

ORIENTATION OF INTERNATIONAL TRADE

Up to this point the analysis has been focused on the production problem, which is the major issue for most countries. Although with a few exceptions most countries import or export only a small proportion of their food supplies, it does not follow that each individual country should aim at ultimate self-sufficiency. But while programming for expansion of supplies for domestic consumption is a practical possibility, it is more difficult to program production for export, where so many decisive factors are outside the control of the exporting country. The establishment of quantitative goals in foreign trade is far less common than the establishment of production goals.

Today many questions are being asked as to the future pattern of world trade in agricultural products. Will the new channels of trade dug by World War II become in some degree permanent, notably the increased dependence of all deficit countries on food from the Western Hemisphere? Or to what extent will this situation prove temporary, giving place to a resumption of the traditional relationships between Europe, the Far East, Africa, and Latin America? Or, again, are these former exporting countries and regions undertaking general economic development programs which will entail retaining more of their food output for consumption within their own frontiers?

These questions immediately raise many others since trade in agricultural products cannot be considered in isolation; it is part of the general exchange of goods and services which also involves raw materials and manufactures and the "invisible" as well as the "visible" items. It has been urged in some quarters that the growth of secondary industries in undeveloped countries will inevitably reduce the volume of international trade. Others argue from past experience that a country, when developed industrially, trades more with other industrial countries than prior to such development.

Discussion of plans and programs for international trade in food and agricultural products is specifically included among the topics for annual review at the FAO Conference, and governments were asked to indicate their expectations of exports and imports for 1949/50. The number of responses, as already mentioned, was far too small this year to permit the putting together of any picture of world trade in farm products. Although some governments understandably do not wish to disclose their intentions, it is hoped that fuller documentation will be submitted next year so that the prospects for international trade can receive more searching analysis. Meantime, from the general evidence presented in Part II of this Report, a few preliminary observations can be made on the role of world trade in the development especially of low-income countries.

In the low-income, densely populated countries, notably the Far East, the amount of land in cultivation is so small in relation to population that with few exceptions all of it is likely to be wanted for growing food for the people. Indeed, even if on all this land the yield per hectare could be raised to the average level of Europe, the peoples of the Far East would still not have enough food to bring their diet up to the average level of Latin America. Therefore, apart from a few specialty crops such as tea, sugar, and rubber, which may be profitable in certain districts, these countries may prefer as time goes on

to build their export trade increasingly on other products—raw materials or manufactures. Indeed, ultimately, if a sufficient export trade of industrial products could be established, it would be logical for the Far East as the most crowded region in the world to become a net importer of food from some of the less densely populated continents. That can happen only when the Far East comes to produce export goods on a sufficient scale to finance the desired food imports.

In Latin America and Africa, on the other hand, although the food consumption levels of the people need to be raised, the agricultural resources may perhaps be sufficient to provide for this and for some food exports too. The peoples of both continents have commercial relationships with Europe and the United States which were less badly disrupted by the war than those with Asia. In both continents, agricultural products are regarded as a mainstay of their export business, though in future the exports will be increasingly of processed rather than of unprocessed foods. But more field surveys of production potentialities are needed before the tentative suggestion of favorable export developments can be substantiated. No doubt the U. S. S. R. could export in substantial quantities and, on a lesser scale, eastern Europe.

Europe is the only continent for which definite programs have been outlined through 1950/51 and these are discussed in Chapter 10. Europe, particularly western and central Europe, plans to import more than prewar quantities of almost all products except fats and rice. Eastern Europe will only reach part of its prewar volume of export of cereals, but will have relatively larger exports of sugar, fruit, and livestock products. The outlook for Europe's trade depends on its success in re-establishing specialization in manufacture for export. The more this prospers the more it can afford to expand its food imports.

The United States, Canada, Australia, and New Zealand are more difficult to discuss. Undoubtedly agricultural production could be expanded further in these countries, probably more rapidly than in any other parts of the world since their farmers have the necessary capital and technical knowledge. But where would the markets be found? The United States has an internal market capable of absorbing much more than at present, but the position of Canada, Australia, and New Zealand is quite different. Any significant increase in output in these countries would be entirely for export, and it might be difficult to dispose of. Canada, to a large extent, requires payment in dollars, while Australia and New Zealand have mainly livestock products to offer, which are beyond the purses of people in deficit low-income countries. Yet reports from these three countries indicate that vigorous efforts at improving technical efficiency are being undertaken which seem likely to result in a high level of output in the not distant future. Out of this situation might well emerge burdensome surpluses, not only in the three Dominions but also in the United States if its farming could not be oriented to fit entirely the needs of the home market or if there were a recession in demand. And these surpluses could coincide with widespread malnutrition due to the absence of a sufficient volume of effective world demand.

It was the recommendation of the Preparatory Commission on World Food Proposals and it has been provided for in the ITO Charter that such situations, if they occur, should be dealt with by the machinery of intergovernmental commodity agreements, including, where appropriate, provisions for the sale of surplus produce at special prices to nutritionally disadvantaged countries. Unless such guarantees can be provided, the fear of eventual surpluses may dictate a cautious instead of an expansionist policy, not only in these four countries but in other food-exporting countries too. Such caution has already become apparent in certain quarters.

Chapter 7

NEXT STEPS

THIS analysis of the world-wide problems of food and agriculture covers familiar ground. Much of what appears here has appeared before in statements of individual governments and in documents published by FAO. Millions of people are hungry; the world's population is increasing alarmingly; production must be increased; soil erosion impoverishes many lands; the introduction of modern farming methods encounters serious difficulties; low-income countries lack money for investment projects; international trade must be revived. These things are well known. They have been repeated again and again; they have almost become platitudes. But what are the nations doing? What steps are they taking to cope with these problems?

Quite naturally the governments of war-damaged countries have been preoccupied during the past two years with reconstruction problems; governments of other countries have also faced urgent problems directly or indirectly connected with the war. Reconstruction and rehabilitation will continue for some years to come, but it is not expedient to wait until the completion of these tasks before beginning to take action on the problems listed above. Certain problems will not wait: the world's population increases every year. Moreover, the constructive remedies consist mostly of projects which will only begin to bear fruit after some time. It is not too soon to pass from the general to the particular and for governments to consider plans for the production battle, lay out the necessary priorities, and put preliminary works into execution. Some of the next steps may be suggested here in broad outline, but it will be for governments in the FAO Conference to determine in concrete terms the action they intend to put in hand.

Special Projects

In some directions a start has already been made. A number of governments have plans for expanding production of particular crops or for improving a particular section of their country by irrigation or some other means. Thus India has in hand a number of irrigation projects. France, Belgium, and Britain have plans for production of peanuts and other export crops from their African territories. FAO is also co-operating with governments in special projects: for example, the introduction of hybrid corn into south-east Europe, the immunization of cattle against rinderpest in southern China, the examination of oilseed production possibilities in Venezuela, etc. It is a vital part of FAO's work

to aid governments in such projects. Activities of this kind may be expected to increase in the near future as more governments become interested in the development of their resources and anxious to expand their agricultural output. A shortage of technicians is stressed again and again in the reports submitted by governments to FAO, and a number of countries have asked for further development of FAO's technical services. FAO may be in a position to procure and make available technical experts to deal with particular subjects and problems in countries where experts are lacking.

Regional Formulation of Plans and Programs

Special projects can be more effective if they form part of a comprehensive agricultural development program. A certain number of governments already have such programs elaborated in greater or lesser detail, but only in Europe, where FAO has already made a survey of programs,[1] and to a lesser extent in North America are there enough such definite programs to afford a clear view of trends in production, trade, and consumption. The next step would seem to be, therefore, a consultation between governments at the regional level with the purpose of formulating concrete programs for agriculture, forestry, and fisheries. Then, in order to move from the stage of paper plans to the execution of practical tasks, it will be desirable to hold technical consultations on particular aspects of the programs, to establish priorities of the order in which the various projects should be undertaken, and to develop mutual aid in procurement of materials and equipment. This regional work may need to be undertaken at a number of levels and in a number of directions simultaneously. For example, there may be some practical action programs to be put into operation immediately. There will be some field surveys to ascertain potentialities for increasing production in specified areas. There will be approaches to other governments inside and outside the region to obtain assistance in personnel and materials, and at the same time there will be the continuing task of formulating and adjusting the country programs in the light of regional and world trends.

It must be further emphasized that these agricultural programs should, as mentioned earlier, form part of programs of over-all economic development. The optimum rate for agricultural expansion depends largely on the rate of expansion that is found to be possible in industry. The co-ordination of these more general programs is receiving the attention of the Regional Economic Commissions set up by the Economic and Social Council, and through this machinery it may be possible to establish without undue delay some concepts of the rate of total economic expansion which can be anticipated in each region.

Review of International Trade

Whereas the next steps in respect to production programs should probably be taken at the regional level, any examination of international trade problems must be on a world-wide basis. This examination can be undertaken commodity by commodity and in more general terms. A continuing watch is being kept upon certain commodities by those member governments who co-operate in the commodity committees of the International Emergency Food Committee. But for commodities which are no longer subject

[1] FAO, *European Programs of Agricultural Reconstruction and Development*, Geneva, June 1948.

to allocation recommendations, special action may need to be taken from time to time. During the past year, for example, FAO has at the request of governments made certain inquiries as to ways of augmenting the export availability of fats and oils. It also made a special study of the international market for fresh fruit and vegetables in Europe. It co-operates closely with intergovernmental commodity councils and their study groups. Other particular questions may arise: for instance, what are the longer-term prospects in international markets for the newly expanded rice industry in Latin America? Or again, are or are not the 1950/51 European import programs for oilseeds, fats, and oils unrealistically high in the light of the world supply outlook? Issues of this type should probably be singled out for early investigation.

As regards work of a more general character to analyze future trends in the international food trade, it will be necessary to have the more precise information which may be expected to arise out of the formulation of national programs in the regions.

Tools for World Review

Governments want to know whether in the next few years the supply of food, fibers, and forest products is likely to outrun demand, or whether scarcity conditions will persist. They can then adjust their agricultural production policies accordingly. They want more nutritional facts about their people so that they can formulate more effective nutritional policies. They want to know what the rural welfare conditions are within their territories and what success has attended various experiments in the improvement of rural welfare in other lands.

If there is to be effective annual discussion of these questions, the basis must be timely and authoritative information covering the greater part of the world. As mentioned already in this document, lack of information makes it impossible this year to provide adequate documentation for the intergovernmental consultation. It is to be hoped that next year a more satisfactory response to requests for information will enable a better survey to be prepared.

To detail here all the points upon which information is needed would be otiose. For production appraisals they include improved and more timely statistics of crop area and production, livestock numbers and output of livestock products, utilization of food supplies, prices, and consumption of farm requisites. (In this connection, the World Agricultural Census projected for 1950 should yield some much-needed basic information.) In respect of international trade, it must be pointed out that at present there is a time lag of up to two years in the publication of the export and import statistics of several important countries. For nutritional purposes, consumption surveys are required, supplemented by clinical surveys, better health statistics, and more comprehensive tables of food composition. For an evaluation of rural conditions, more field surveys need to be undertaken, even if quite modest in scale, to throw light on education, housing, health, co-operative organization, land tenure, etc. In order to appraise the demand for agricultural products, both nationally and internationally, better population statistics are needed as well as national income data and data on developments in other sectors of the economy.

The improvement of the world picture will necessarily be a slow process and an arduous one. The procedures for getting facts are tiresome and the purpose that the required facts may serve is not always clear. Governments do not make themselves popular by issuing questionnaires, and neither do international organizations. At the

same time, governments are asking for a more adequate picture of the world economy. Blind groping forward has to be replaced by some more scientific reconnoitering. As yet, the scouts are unskilled and the glasses imperfect. The purpose of this series of annual reports is to improve the focus gradually until governments are able to see more clearly the shape of coming events, and as a direct consequence can take each year more and more practical action toward improving the world's food supply and the people's nutrition and health.

PART II

PROBLEMS OF THE REGIONS

Chapter 8

LOWER-INCOME, DENSELY POPULATED REGIONS

THE FAR EAST[1]

THE CENTRAL problem of the Far East is production, both in agriculture and in industry. Can this region, which contains half the world's population living on one-fifth of the earth's land surface, produce enough food and other commodities to afford to everyone a better standard of living? At present, income per person is very low—according to some authorities, well under U. S. $100 per year. Assuming an attempt is made to reach the nutritional targets set out in Chapter 4, the expansion of 40 percent in food expenditure would, as already pointed out, have to be associated with an increase of some 50 percent in real income. The question is: could real income per person be increased to this extent by, say, 1960, and could the food supply be expanded by the necessary amount?

The experiences of World War II have brought the problems of the Far East into sharper relief. First, a number of territories have emerged with a greater measure of political independence. Second, the wartime dislocation of production and transportation has served to emphasize the precariousness of the margin between subsistence diets and starvation. Third, the currency inflations which afflict several Far Eastern countries have increased the maldistribution of the already inadequate food supply. Fourth, and perhaps most important of all, circumstances have been so difficult that governments in all these countries have assumed responsibility for the national food supply to an extent not previously contemplated.

The most damaging effects of the war were upon transportation. Another feature was the ruthless slaughter of draft animals, especially during the last phase of hostilities, which left many countries such as Burma and Siam with tremendous difficulties in returning to prewar levels of food production. Currency inflation, in most countries, was due to shortage of food supplies coupled with a lack of consumer goods such as textile materials, which had been supplied mainly by Japan before the war. In China the inflation has been aggravated by civil war and unbalanced budgets.

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[1] Countries and areas dealt with in this section are: Burma, Ceylon, China, India, Indonesia (but statistics only for Java and Madura), Indo-China, Japan, Malaya, Pakistan, the Philippines, and Siam. These countries cover 90 percent of the population of the ECAFE region of "Asia and the Far East." Due to the limitations of statistical information at present, these countries are not treated in equal detail. Conditions in Indonesia and Indo-China are still unsettled and information for these areas is necessarily fragmentary. India and Pakistan are treated as one area. For China, only 22 provinces (China proper) are included in the discussion, while the 9 northeastern provinces (Manchuria) as well as Jehol, Sikang, Sinkiang, Tibet, and Taiwan are only occasionally mentioned. For lack of data, Korea is hardly discussed.

The Far East, although having such a large population and so little cultivated land, depends overwhelmingly upon its own food production. Imports, even of the magnitude of recent years, provide only a fraction of the total food supplies of countries like China and India, though imports may, of course, bulk large in the supplies of the large coastal cities. Most of the people, however, live on small farms, producing most of what they eat and eating most of what they produce. Commercial supplies for domestic use or export result from assembling very small quantities from large numbers of mainly self-sufficient producers.

Production and Trade

In each of the countries dealt with in this section, food production in 1947/48 was generally larger than in 1946/47. Indeed, in Siam, the Philippines, and India/Pakistan, production was probably slightly above the prewar level.

Production of rice, wheat, and maize, the three staple food crops for the majority of the inhabitants of the Far Eastern countries, is set forth in Table 15.

The slight increase in wheat production compared with prewar has been more than offset by the fall in rice production. This decline has been particularly severe in China, Indo-China, Burma, and Indonesia. Production of other food crops such as roots

TABLE 15.—PRODUCTION OF CEREALS IN SELECTED FAR EASTERN COUNTRIES

Commodity and Country	1934–38 Average	1946/47	1947/48
	(*Thousand metric tons*)		
Rice (Paddy)			
Burma	6,971	3,836	5,352
Ceylon	300	254	224
China, 22 provinces [1]	50,064	46,006	46,507
India/Pakistan	38,721	42,887	41,845
Indo-China	6,498	4,082	4,287
Indonesia:			
Java and Madura	6,081	4,338	5,145
Bali and Lombok	452	325	466
Japan	11,523	11,453	11,194
Malaya	513	421	548
Philippines	2,179	2,198	2,335
Siam	4,357	3,864	4,700
TOTAL	127,659	119,664	122,603
Wheat			
China, 22 provinces [1]	21,743	22,736	25,029
India/Pakistan	9,967	9,045	8,108
Japan	1,288	615	767
TOTAL	32,998	32,396	33,904
Maize			
Burma	39	19	20
China, 22 provinces [1]	6,497	7,639	6,724
India/Pakistan	2,118	2,411	2,731
Indo-China	594	420	427
Japan	75	64	62
Java and Madura	1,979	722	1,313
Malaya	...	1	1
Philippines	427	565	465
Siam	5	8	9
TOTAL	11,734	11,849	11,752

[1] 1931–37 average.

TABLE 16.—TRADE OF THE FAR EAST IN PRINCIPAL FOODSTUFFS [1]

Commodity and Period	Imports	Exports	Net Trade (Import+ Export−)
	(*Thousand metric tons*)		
Rice[2]			
1934–38 Average	6,652	8,603	−1,951
1946	1,566	1,178	+ 388
1947	1,625	1,279	+ 346
1948	2,682	2,368	+ 314
Cereals			
1934–38 Average	1,354	1,479	− 125
1945/46[3]	2,832	...	+2,832
1946/47[3]	5,336	...	+5,336
1947/48[4]	4,782	...	+4,782
Sugar			
1934–38 Average	1,549	3,108	−1,559
1946	125	17	+ 108
1947	64	10	+ 54
1948 (estimated)	...	[5] 280	...
Fats and Oils (oil equivalent)			
1934–38 Average	350	2,600	−2,250
1946	100	650	− 550
1947	150	1,120	−1,020
1948 (estimated)	170	1,250	−1,080

[1] Includes all countries of the Far East, not merely those mentioned in Table 15.
[2] Imports represent amount exported from exporting countries to importing countries. Figures for 1948 are for allocations.
[3] Shipments from exporting countries to importing countries, 1 July—30 June.
[4] Same as above, preliminary.
[5] Philippine export estimate.

and tubers, pulses, and vegetables and fruit is generally higher than in prewar years, and these foods have to some extent made up the deficiency in cereals.

Some export crops such as rubber and copra have regained their prewar level of output, but less progress has been made with other products such as sugar, palm oil, coffee, tea, spices, and textile fibers, which are still suffering more or less severely the effects of wartime neglect or destruction.

Food exports from the Far East in 1947/48 show considerable recovery over the previous year, as Table 16 shows, but the surpluses were still only a fraction of prewar. Recovery has been most conspicuous in the Philippines and Burma.

Food imports into the Far East also exceeded those of the previous year, especially imports into India and Japan; but again, these were very small compared with prewar imports.

From being a net exporter, the Far Eastern region has become a net importer of cereals and rice. Net exports of sugar are as yet negligible and exports of fats are less than half of prewar quantities. This change, although not significant in relation to the total food supply of the region, is of great significance to world trade in these particular commodities. People are naturally anxious to know whether the present import requirements of the Far East are temporary and the exports likely to be restored soon, or whether this region is going to be permanently a net importer of foodstuffs.

China

Generalizations are difficult for such a vast country in which communications remain inadequate. Frequently food surpluses appear in one part of the country while there is famine in another part. The diets of the wheat-eating people in the North differ radically from those of the rice-eating people in the South; those of the

people on the coast from those of the inhabitants of the western provinces. Moreover, agricultural production statistics in China, as in other Far Eastern countries, have to be treated with considerable reserve.

Subject to these qualifications, it appears that cereal crops in general in 1947/48 reached approximately the prewar level. A decline in production of rice and kaoliang was compensated for by an increased output of wheat and maize. More sweet potatoes and other root crops were grown but there was a fall in the production of soybeans and in livestock numbers. The production of tea showed a gain over the previous year, but inflation and foreign exchange control made it difficult to resume exports.

China's food imports consist at present almost exclusively of cereals — 563,000 metric tons in 1947/48, compared with a prewar figure of over 900,000 tons. The prewar substantial imports of sugar have not been resumed.

China's exports of vegetable oils and tea are small compared with prewar. The bulk of oil and oilseeds exports consists of tung and teaseed oils from South China. Tea exports previously went to the United Kingdom, North Africa, and the U.S.S.R., but the United States of America is now becoming an important market.

Food consumption levels vary greatly from province to province and from year to year, and a national average means little. Compared with prewar, the consumption of cereals has fallen, and the decline has been only partially offset by increased consumption of sweet potatoes and other starchy foods. The over-all calorie consumption appears to be about 5 percent below prewar.

India and Pakistan

Comparisons of postwar and prewar food production in the subcontinent of India are difficult because before the war a considerable proportion of the crop area was not reported, whereas it is believed that now the statistics give a somewhat fuller but still incomplete coverage. On the whole, there seems little evidence of a substantial change in the level of the output of wheat, rice, millet, and the other principal cereals. The 1947 season was particularly adverse, the wheat crop being badly affected by rust, but the 1948 harvest is reported to be very satisfactory for all cereals. Total supplies of staple foodstuffs improved during the past year. Rationing is being lifted by stages and a reserve of food grains is being accumulated.

Jute production in 1947/48 reached 1.55 million metric tons, a substantial improvement over the previous season and larger than the 1934-38 average. The area and production of cotton are only two-thirds of the prewar amount.

India's food imports continue to consist primarily of wheat and maize, as substitutes for rice. The quantities are large from the point of view of the world market but small in relation to India's total production of cereals. India's exports of oilseeds and vegetable oils, although slightly larger than in 1946/47, are still far below prewar quantities and show no immediate sign of increasing.

The partition of India has created new difficulties. India formerly obtained food supplies from what is now Pakistan, but it remains to be seen to what extent Pakistan will wish to export food or keep it to improve the diet of its own people.

Consumption statistics, for what they are worth, show a significant decline in the per caput consumption of cereals and livestock products as compared with prewar, but this may be partly accounted for by the possibility that population statistics are more accurate than agricultural statistics. Consumption levels are reported to be improving in 1948.

The Five Food Exporters — Burma, Indo-China, Indonesia, the Philippines, and Siam

In these five countries the central agricultural problem has been the rehabilitation of food production for export; rice in Burma, Indo-China, and Siam; oil crops and sugar in Indonesia and the Philippines.

Recovery in rice cultivation has proceeded satisfactorily in Burma and Siam, but less so in Indo-China on account of political unrest. In Burma the 1947/48 crop reached 5.4 million metric tons of paddy, a notable advance on the previous year and comparing with the prewar average of 7.0 million tons. The weather in 1947/48 was very favorable, and besides rice the peanut and cotton crops were the best since the war. However, because of increase in consumption of rice inside Burma, exports are still only 50 percent of the prewar level.

In Siam, although the production of rice has fully recovered, more is being consumed locally and exports have been held back partly on account of the low prices fixed for the duration of the Tripartite agreement. Prices have now been adjusted upwards and exports approaching a million tons may be forthcoming in 1948/49.

Whereas in Burma shortages of draft animals and farm equipment continue to impede production, in Siam the supply of tools and light implements is now more adequate as is also the supply of insecticides and veterinary requirements. The worst ravages of the rinderpest epidemic of 1946 have been overcome. There is still a shortage of construction materials to develop irrigation works. During the war, when imports of sugar were cut off, the cultivation of sugar cane was expanded in Siam and the production is now sufficient to meet the needs of the country.

In Indo-China, general disorganization and economic insecurity have discouraged production of crops for commercial sale so that the output of rice, maize, sugar, coffee, and pepper continues at a very low level. Civil strife has hampered the transportation of crops to markets and ports and the transportation of sugar cane to sugar factories. Exports of all foodstuffs continue to be negligible in quantity but improvement is expected in the coming year. Rubber is the only commodity of which production and export have reached the prewar average level.

In Indonesia, an increase in the area planted to the main food crops, favorable weather, and cessation of hostilities in the autumn of 1947 brought about an improvement in food production during 1947/48, but the level of supplies is still below that of prewar. The repair of irrigation works, clearing of neglected crop areas, and new planting of rice and sugar cane are already under way. To rehabilitate commercial crop production, Indonesia needs early delivery of fertilizers and food-processing machinery.

The output of crops for local consumption has recovered to 70-80 percent of prewar, although there is difficulty in assuring equitable distribution between the various islands, particularly in respect to rice. The output of crops for export, notably sugar and vegetable oils, remains disorganized, and exports are as yet negligible. However, exports of copra from Indonesia did reach 148,000 metric tons in 1947, compared with 500,000 tons prewar. Sugar exports are planned to recover to about 200,000 tons by 1949/50, compared with one million tons prewar. The rehabilitation of other commercial crops such as rubber, tea, coffee, tobacco, cinchona, and spices has been slow because of the unsettled internal situation. It is hoped to obtain foreign credits with which to buy necessary fertilizers, farm equipment, and processing machinery which would make possible in 1949/50, according to Government plans, export of 250,000 tons of copra, 200,000 tons of palm oil, 410,000 tons of rubber, and the above-mentioned quantity of sugar.

In the Philippines, the recovery of the general prewar level of production plus reasonably adequate rice imports kept supplies at a steady level throughout 1947/48 and prevented the sharp price increase associated with the period of scarcity which usually occurs just before harvests. The maize crop was damaged by the typhoon, but even so the production was higher than prewar. Output of root crops is reported to be more than twice the prewar level — a compensation as in other Far Eastern countries for the short supply of other foods. Nevertheless, population has expanded so rapidly that per caput food supplies are still below the prewar level.

As regards export crops, the rehabilitation of the copra industry has been one of the most remarkable postwar phenomena in the Far East. In spite of considerable disorganization during the war, production was revived so rapidly with the aid of United States equipment that exports in 1947 reached 987,000 tons, compared with the 1934-38 average of 293,000 tons. The 1948 exports will be smaller, partly on account of the typhoon damage and partly because production has probably reached the maximum possible from the present area of coconut palms. Rehabilitation of the sugar export industry has proceeded much more slowly as a result of inadequate fertilizer supplies, lack of high-yielding varieties of cane, and inability to obtain early delivery of mill machinery. Production in 1947/48 was still less than one-half of prewar but exports are expectetd to be on a moderate scale in 1948/49. The Philippine Government has announced a plan to build the largest sugar central in the world. Abaca (Manila hemp) production in 1947 reached 100,000 tons, compared with 50,000 tons in 1946. Much of the revival in output in 1947 was due to overstripping and butcher-harvesting in an effort to get maximum benefits from high fiber prices. Output is expected to be less in 1948, and even by 1950 is unlikely to reach the prewar level of 170,000 tons.

Food-importing Countries (Ceylon, Malaya, Japan, and Korea)

Ceylon and Malaya are highly dependent upon imports of basic foodstuffs while at the same time they have specialized in other agricultural crops for export. Both are striving to diversify their economies and become less dependent on imports of food, but this process will take considerable time. Before the war Ceylon imported over 70 percent of its rice requirements. During the war and since, it has been obliged to substitute wheat for rice imports to a large extent, but the combined quantity remains about the same. As elsewhere in the Far East, production of root crops, vegetables, and fruits is reported to be higher than in the prewar period.

Ceylon's chief agricultural exports are tea, rubber, and coconut products. Tea production for export is higher than prewar and prices have risen substantially during the past year. The wartime boom in rubber production has ended and, since Ceylon is a high-cost producer, it is necessary to shift to some extent out of rubber to other crops. Special programs have been formulated to organize this transition with as little hardship as possible. The coconut palms are still suffering from the effects of the drought in 1945/46. Export of copra and coconut oil was lower in 1947/48 than the previous year and less than one-half of prewar.

Malaya has always relied on imports for about 60 percent of its rice supply and, like Ceylon, has had to import wheat in place of rice during and since the war. However, total supplies of cereals have been quite inadequate and official rations for the urban population have been extremely low. The Malayan Government ordered all agricultural estates of more than 40 hectares to devote at least 2 percent of their area to food crops. Repair of dikes and irrigation work has been actively undertaken, as

well as the completion of irrigation projects planned before the war. The Government has distributed seed to rice growers and has carried on a campaign against rinderpest, which was depleting the stock of work animals. There has been a notable increase in output and consumption of sweet potatoes, cassava, yams, vegetables, and fruit.

Of the export crops, rubber has recovered most rapidly and rubber exports were at 668,000 tons in 1947, compared with 423,000 tons on the average for 1934-38. However, part of this export is reported to have come out of existing stocks. The copra and palm-oil industries have recovered less rapidly. There has been increased retention of oil for local consumption, and exports are still far below prewar. The pineapple-canning industry suffered from lack of sugar and tinplate, and production is only about 17 percent of prewar.

In Japan, despite typhoon damage, the 1947 rice crop was estimated at 9 million metric tons of brown rice, or about 97 percent of prewar. By contrast, the harvest of summer grains—wheat, barley, and naked barley—was about 30 percent below prewar largely because of a decrease in yields, these crops being more affected by the shortage of fertilizers.

Production of potatoes and sweet potatoes was better than in the previous year and much higher than prewar. On the other hand, output of fish and livestock products is still comparatively low. Despite the generally unfavorable economic conditions, such as lack of fertilizer, lack of incentive goods, and the currency inflation, the total crop output has been satisfactory, largely because of favorable weather.

The 1948/49 targets call for a 10 percent increase in food production and include plans for increased imports of fertilizer materials, notably more phosphate.

Since the end of the war, Japan's foreign trade has been handled by the occupying forces and most of it is on a government-to-government basis. Since August 1947, however, private traders have been allowed to participate in foreign commerce, though their activities are strictly controlled. Food imports were much larger in 1947/48 than in the previous year and came mainly from the United States of America, whereas prewar imports came mainly from the Japanese territories of Korea and Taiwan. Compared to the large prewar imports of rice, sugar, and oilseeds, Japan imported in 1947 only 1,055,000 tons of wheat and wheat flour and only 42,000 tons of sugar. Japanese exports of silk and textile manufactures, although recovering, are still only a fraction of the prewar volume.

Food consumption levels have fallen severely because, while food supplies have declined, the population has increased very suddenly as a result of the repatriation of millions of Japanese from other areas. The calorie value of the average diet is more than 20 percent less than prewar and the diet consists more exclusively of cereals and other starchy foods. In order for diets to regain even the inadequate prewar level, Japan must sooner or later develop new overseas sources of supply. When this time comes, it will of course aggravate the world's scarcity of rice and of fats.

In South Korea the production of rice has been well maintained, but output of wheat and barley has fallen as compared with prewar. Before the war, South Korea exported very large amounts of rice to Japan, while certain quantities of other grains moved from North to South Korea. In 1947 South Korea had a net import of grains and pulses of 480,000 tons. The reduction in reported grain output is believed due to a reduction in double cropping and a lack of fertilizers. By contrast, the production of sweet and Irish potatoes has more than doubled while production of other vegetables is reported increased by 50 percent. The sudden increase in population due to repatriation and an influx from North Korea has aggravated the food supply situation, and

the calorie value of the average diet for the total population in 1948/49 is reported at 1,330 calories per person per day. However, the great majority of South Koreans live in rural areas and probably have access to foodstuffs which are not susceptible to official report or estimation.

Consumption

The range in food supply levels in 1947/48 among countries listed in Table 17 estimated in terms of energy is 1,680 to 2,160 calories per person per day. The quantities

TABLE 17.—PER CAPUT SUPPLIES OF MAJOR FOODSTUFFS IN SELECTED FAR EASTERN COUNTRIES, PREWAR, 1946/47, AND 1947/48

Country and Period	Rice[1]	Bread Grains[1]	Coarse Grains[1]	Total All Grains[1]	Roots, Tubers, and Starches	Sugar[2]	Pulses and Nuts	Fats and Oils[5]	Animal Products[4]	Fish[3]
	(*Kilograms per caput per year at the retail level*)									
Burma										
1934–38	141.8	2.4	4.8	149.0	6.1	10.2	9.1	4.3	31.0	37.2
1946/47	125.9	1.0	3.0	129.9	7.6	6.7	10.8	2.3	16.0	34.2
1947/48	163.7	1.3	5.6	170.6	7.5	6.6	10.9	2.8	16.4	33.6
Ceylon										
1934–38	126.6	4.2	5.0	135.8	12.9	13.0	110.0	2.6	25.9	9.5
1946/47	60.8	34.4	4.8	100.0	9.9	13.8	87.8	4.8	19.4	7.2
1947/48	57.1	42.9	6.8	106.8	11.5	14.3	90.4	5.5	19.6	7.3
China (22 provinces)										
1931–37	86.9	37.3	47.4	171.6	30.1	1.2	25.3	6.3	14.4	2.8
1946/47	79.5	38.4	48.7	166.6	39.5	0.7	21.0	5.7	10.8	2.7
1947/48	79.5	41.8	43.5	164.8	34.8	0.5	24.0	6.5	11.5	2.7
India/Pakistan										
1934–38	79.8	21.6	39.3	140.7	7.6	14.9	22.3	3.3	68.9	1.6
1946/47	69.8	19.3	29.8	118.9	7.2	13.7	20.4	3.4	60.4	1.4
1947/48	67.7	17.8	30.6	116.1	7.2	13.6	20.2	3.5	59.8	1.4
Indo-China										
1934–38	139.7	0.9	2.9	143.5	18.2	6.8	4.7	2.2	29.6	22.8
1946/47	109.9	0.6	15.8	126.3	43.0	5.6	9.4	2.1	9.2	12.1
1947/48	120.5	0.3	16.4	137.2	44.7	6.5	7.1	1.6	5.2	12.4
Japan										
1934–38	133.8	10.4	18.5	162.7	67.1	12.9	8.9	1.9	14.1	34.4
1946/47	107.4	11.7	9.1	128.2	67.8	0.1	1.8	0.1	6.1	36.2
1947/48	102.4	19.4	17.8	139.6	56.7	0.7	3.4	0.5	3.8	37.8
Java and Madura										
1934–38	86.2	1.1	40.5	127.8	156.7	6.7	7.9	2.8	6.3	4.4
1946/47	57.5	—	14.1	71.6	132.5	8.1	13.9	2.7	3.8	2.6
1947/48	67.6	—	25.7	93.3	179.3	8.1	31.5	2.7	4.3	3.5
Malaya										
1934–38	187.8	12.0	4.8	204.6	8.9	6.2	26.4	6.4	25.2	20.3
1946/47	84.4	46.7	0.5	131.6	40.4	6.2	16.3	3.4	10.0	19.7
1947/48	125.6	46.7	0.2	172.5	29.5	6.2	16.3	3.4	10.0	19.7
Philippines										
1934–38	96.6	5.3	27.1	129.0	24.0	7.3	17.2	3.4	24.2	48.4
1946/47	85.3	14.2	28.3	127.8	22.9	9.5	17.4	5.0	13.8	33.8
1947/48	78.7	14.2	22.6	115.5	22.9	10.0	17.4	5.0	18.5	46.0
Siam										
1934–38	97.6	0.9	0.2	98.7	23.3	9.5	17.1	4.7	45.3	48.4
1946/47	110.2	0.2	0.5	110.9	23.3	6.5	17.2	4.7	39.2	48.4
1947/48	139.4	0.2	0.5	140.1	23.3	10.8	17.0	4.7	40.6	48.4

[1] Milled basis. [2] Includes syrups, candy, and refined sugar. [3] Includes fresh and processed fish. [4] Includes meat, eggs, and dairy products. [5] Includes vegetable oils, marine oils, butter, and other animal fats in terms of pure fat.

appear to be generally higher than in 1946/47. There were no major famines during the past year, but evidences of malnutrition and undernourishment were widespread. Both the quantitative and qualitative dietary defects of Far Eastern territories which were evident before the war have now become more pronounced. There are only three countries in the region, namely Burma, Siam, and Indo-China, the chief rice exporters, in which the calorie-value level was higher than prewar. The greatest deterioration in diets has occurred in Malaya and Japan.

Tables 17 and 18 show data on food consumption and nutritional status in selected countries. It must be emphasized that the production statistics underlying these calculations are extremely incomplete and consequently the tables contain many peculiar results, for example, the extraordinarily low figure for prewar rice consumption in Siam. It is hoped that by further consultation with the governments concerned some of these evident anomalies in consumption statistics may be removed.

TABLE 18.—NUTRITIVE VALUE OF FOOD SUPPLIES IN SELECTED FAR EASTERN COUNTRIES

Country and Period	Calories (estimated)		Protein			Fat
	Daily Supply per Caput	Percentage from Cereals and Tubers	Daily Supply per Caput		Animal Protein Related to Total Protein	Daily Supply per Caput
			Total	Animal		
	(*Number*)	(*Percentage*)	(..... *Grams* .....)		(*Percentage*)	(*Grams*)
Burma						
1934–38	2,080	68.1	72.2	32.7	45.3	31.9
1946/47	1,762	70.5	63.7	27.2	42.7	21.2
1947/48	2,145	75.6	77.8	33.2	42.7	29.9
Ceylon						
1934–38	2,059	63.6	49.8	7.2	14.5	46.1
1946/47	1,705	56.1	47.9	12.3	25.7	47.4
1947/48	1,824	56.0	53.1	12.4	23.4	49.6
China (22 provinces)						
1931–37	2,234	76.1	70.6	5.6	7.9	40.1
1946/47	2,115	79.5	64.5	4.5	7.0	35.2
1947/48	2,136	77.2	66.4	4.5	6.8	38.4
India and Pakistan						
1934–38	1,976	67.6	56.5	8.7	15.2	28.9
1946/47	1,712	66.0	48.9	7.6	15.5	27.0
1947/48	1,685	65.3	47.7	7.6	15.9	27.0
Indo-China						
1934–38	1,896	76.6	48.3	12.1	25.1	25.3
1946/47	1,811	77.6	42.8	5.8	13.6	16.0
1947/48	1,919	80.1	44.1	4.7	10.7	16.3
Japan						
1934–38	2,230	75.8	72.7	12.0	16.5	24.5
1946/47	1,602	86.8	50.1	10.5	21.0	12.8
1947/48	1,684	86.6	53.1	9.7	18.3	14.3
Java and Madura						
1934–38	2,045	84.2	46.3	4.4	9.5	24.4
1946/47	1,453	73.1	36.0	2.6	7.2	16.7
1947/48	1,840	77.2	44.4	3.2	7.2	21.6
Malaya						
1934–38	2,706	74.8	62.0	12.1	19.5	44.0
1946/47	1,790	78.5	41.6	7.6	18.3	24.1
1947/48	2,152	82.2	48.7	7.5	15.4	24.6
Philippines						
1934–38	1,855	69.4	53.4	19.6	36.7	33.6
1946/47	1,826	70.1	46.8	13.2	28.2	39.3
1947/48	1,770	65.6	48.8	18.0	37.3	39.2
Siam						
1934–38	1,756	58.7	52.2	25.0	47.9	36.3
1946/47	1,816	63.3	52.9	27.7	42.9	35.1
1947/48	2,157	65.6	58.2	23.0	39.5	36.9

Rationing is still in force in varying degrees in most Far Eastern countries. In Japan this extends to all important foodstuffs. Malaya abandoned rationing of wheat and wheat-flour early in 1948 but still rations rice. In Ceylon rice, flour, and sugar are rationed. Rice and imported foods are rationed to about 3 million people in Indonesia. India has derationed cereals during the past year but maintains controls of food imports. China instituted a rice and wheat-flour rationing system early in 1948 in five major cities.

The widespread incidence of malnutrition is documented by dietary and nutritional surveys in several countries. For instance, in some districts in South India it is reported that the population has a calorie-value level so low as to be on the verge of starvation, whereas in some eastern districts diets provide as much as 2,400 calories per person per day. In Indonesia, a shortage of food among many groups is reported to be manifested in decreased capacity to work. Even in Burma and Siam the diets are unbalanced because of the predominance of highly milled rice. These diets are deficient in good animal proteins, B-vitamins, and certain minerals, especially calcium. Similar dietary deficiencies are noted in the Philippines. For instance, a recent clinical survey in Bataan Province revealed the existence of beriberi in 7 to 9 percent of the population in 9 out of 12 municipalities.

Increasing Supplies

The current food supply of these Far Eastern countries is being steadily improved, and diets have recovered or are recovering toward prewar levels. The question arises whether agriculture is merely making good the dislocation arising out of World War II or whether this recovery is going to be part of a long-term upward trend in production. Before the war, although statistics are far too imperfect for any reliable judgment to be made, there was no evidence of an upward trend in production of staple food crops in any Far Eastern country except Japan, where because of intensive agricultural research the rice output expanded steadily.

Since the war, as mentioned in the Introduction, governments have throughout this region taken a much greater interest in food supplies. One of the most encouraging features of the past year has been the formulation at the Baguio Conference[2] of rice targets for the next three years. This indicates a determination to set about an expansion of production. The targets may be criticized for not being ambitious enough and not taking sufficient account of prospective increases in population. Nevertheless, they do represent the introduction for the first time of the technique of production goals; and once the technique is firmly established, the goals can be modified in accordance with changing circumstances.

The difficulties of any production expansion are indeed formidable. One solution might be to find new areas of land to bring into cultivation. Table 19 shows that in most of these territories there is less than one-third of a hectare of cultivated land per person.

However, the table also shows that except in India and Java not more than one-fifth of the total land area is cultivated in any one country. Much of this land is in areas too dry or too cold for the growing of crops. Much of it that is in areas of suitable temperature and rainfall is too steep and mountainous to be used. Much of it has suffered centuries of soil erosion. Nonetheless, surveys are needed to ascertain whether

[2] FAO, *Report of the Rice Meeting*, Washington, U. S. A., June 1948.

TABLE 19.—ARABLE LAND IN RELATION TO TOTAL AREA AND POPULATION IN SELECTED FAR EASTERN COUNTRIES, 1947/48

Country	Total Area	Arable Land	Arable Land Related to Total Area	Arable Land per Caput
	(..... *Thousand hectares*.....)		(*Percentage*)	(*Hectares*)
Burma	60,500	8,567	14.2	0.50
Ceylon	6,600	1,344	20.4	0.20
China (22 provinces)	507,065	97,668	19.3	0.24
India/Pakistan	409,585	...	...	...
Reporting area	(266,804)	(113,284)	(42.5)	(0.31)
Indo-China	74,000	6,000	8.2	0.25
Indonesia	190,435	...	...	...
Java and Madura	(13,217)	(8,909)	(67.4)	(0.18)
Japan	37,978	5,796	15.3	0.07
Malaya	13,250	2,053	15.5	0.34
Philippines	29,741	3,954	13.3	0.20
Siam	51,352	5,000	9.7	0.29

there may not be some areas, albeit restricted in size, upon which farming could be extended.

Undoubtedly principal attention must be centered upon increasing the yields of the areas now in cultivation. The contrasts between crop yields in the various countries can be appreciated from the following selected 1934-38 average rice yields per hectare: Japan—36.3 quintals; China—25.3; India/Pakistan—13.3; Philippines—10.9 . The yields of other crops varied in roughly similar proportion. The scope is certainly large in some of the low-yield countries; provided that the soil can be improved and fertilizers and insecticides can be obtained and distributed. The following information is available as to government programs.

In China a five-year food production program, inaugurated to start in January 1948, covers nine principal food crops and concentrates activity in selected districts where the increased output will bring most benefit to deficit areas. The program includes supply, improved seeds and fertilizers, introduction of improved cultivation practices, control of pests and diseases, extension of the cultivated area, and improvements in the storage and processing of products. The program envisages an increase of 1.6 million tons of rice and wheat and 1.25 million tons of potatoes, vegetables, and other grains. Expansion is also programmed for non-food crops such as cotton, tobacco, tung oil, silk, and tea.

The Government of the Dominion of India has prepared a five-year program aiming at the production of 4 million tons of additional food grains by 1952. It is expected that by partial completion of certain major irrigation projects and particularly from the execution of several small projects, such as construction of tube and percolation wells in suitable areas, an increase of 1,355,000 tons of grains will be achieved. Land reclamation and development will add 662,000 tons of grains. Improvement in seed and its distribution is to add another 815,000 tons. And finally, by increased use of manures and fertilizers, 1,153,000 tons of food grains can be realized. The responsibility for the execution of these projects lies mainly with the provincial governments. The success of the program will depend very largely on the availability of the essential supplies such as fertilizers, farm machinery, and equipment for small irrigation schemes.

In addition to the five-year plan mentioned above, India has a long-term irrigation and fertilization program. It is hoped that by the end of 15 years, major irrigation projects which are now being planned will either have come into operation or will be about to come into operation. It is expected that some 4 million hectares will have

an assured timely irrigation for the rice crop. There would still be over 18 million hectares needing to be covered by controlled irrigation. During the course of another 20 years, it is expected that 8 million hectares in addition to the 4 million hectares mentioned above will be under controlled irrigation.

In Pakistan, projects which are expected to increase the supply of rice in the next three years may be summarized as follows: a scheme for sinking 2,500 tube wells and 15,000 percolation wells in West Punjab and a minor irrigation and drainage scheme in East Bengal.

The Government of Burma is aiming at the restoration of over a million hectares of fallow land to rice cultivation by (1) conservation of the remaining draft power through total prohibition of cattle slaughter, (2) subsidy payments to farmers, (3) subsidized distribution of seeds, implements, and consumer goods to farmers, (4) organization of centralized rice buying to maintain prices at desired levels, and (5) the provision of tractors to cultivate crops in the dry zone.

Siam has a three-year rice production and export program in which the Government will aid, first, by distribution to farmers of seeds, tools, and consumer goods, reconstruction of damaged irrigation systems, and construction of new small irrigation works, rehabilitation of inland transports, and development of co-operatives; and second, by procurement from abroad of tractors, plows, binders, threshers, fertilizers, insecticides, and anti-malaria and other drugs. A longer-term expansion program would involve a large water-control project in the upper reaches of the Chao Phya River, which would permit large-scale irrigation and control of floods on the central plain, but funds are not available. Attention is to be given to the selective breeding of higher varieties of rice and to experimental work with fertilizers.

In Indo-China there are programs for the repair of irrigation works and of dikes and embankments for flood control. Plans are being drawn up for further considerable irrigation works in all parts of the country which may affect more than three-quarters of a million hectares when ultimately completed.

The Philippine Government has a 10-year agricultural development program which includes a goal of self-sufficiency in rice and maize to be reached in five years. Government farms are to be established which at the end of the period should be producing 660,000 metric tons of rice. These are to be large farms of 4,000 to 10,000 hectares, fully mechanized. The Government is also expanding production of better quality seed and distributing it to farmers.

In Indonesia much is being done to reconstruct damaged irrigation works, and for the moment new projects are being delayed for lack of funds, personnel, and equipment. These new projects envisage bringing under irrigation an area of more than 750,000 hectares. It is understood also that production goals have been worked out for principal export crops upon which Indonesia relies heavily to pay for imports.

In Ceylon extension and advisory work is being undertaken through agricultural co-operative societies, large numbers of which are currently being organized. They encourage an increase in the land area under cultivation and the introduction of new or improved methods of cultivation, better farm implements, better varieties of seed, improved plant and animal breeding, and the provision of marketing facilities and rural credit. A program is being started for bringing under cultivation about 40,000 hectares of salt marsh land along the coast by introducing a salt-resistant variety of paddy.

The Government of Malaya has a 10-year program for the construction of irrigation works, both on land under cultivation and on new land. At present only about one-third of the 285,000 hectares under wet paddy cultivation has permanent irrigation.

When the program is completed it is expected that 142,000 hectares of existing paddy land will have permanent irrigation, and some 73,000 hectares of swamp and jungle land will have been converted to rice-growing.

In Japan the improvement of irrigation and drainage systems, interrupted by the war, has now been resumed. There is also a 15-year land reclamation program under which 2 million hectares should be brought into cultivation, but progress toward this goal will be slow and costly. A land-reform program was enacted in October 1946 to transfer the ownership of farm land from noncultivating landlords to the cultivating peasants. It is estimated that about 2 million hectares of land will be purchased by the Government for sale to the cultivators, and as of 31 March 1948 the Government had purchased 1.6 million hectares and had already sold to farmers about 424,000 hectares. The cultivators may pay in cash or in 30 annual installments with interest at 3.2 percent; under existing economic conditions a great many are able to pay cash.

Nutritional Policy

It is not clear whether fulfillment of these much-needed programs would bring about any significant change in the food supply per person or whether they would merely keep pace with population growth.

In view of these doubts concerning the adequacy of the proposed expansion of the food supply, it is most important to make the best nutritional use of whatever is available. There are some research institutes studying the problem of how to ensure a more balanced diet for the people, whose daily diet is highly milled rice and who are so poor that they often cannot afford enough of that. In particular, attention has been focused on how to increase the thiamin content of the diet by improving the strains of rice, minimizing the loss of thiamin in rice preparation and cooking, and introducing other foods high in thiamin content. At the meeting of nutrition experts in Baguio in March 1948, recommendations were made for modernizing rice-milling equipment, parboiling rice before milling, and investigating improved methods of parboiling to make the product more acceptable to the consumer.

In most countries in the Far East a beginning has been made in feeding the vulnerable groups, but few well-organized feeding programs of any size and permanency have been established as yet. Siam is planning trials on supplementary feeding of school children. Ceylon has experimented on the most successful type of meal and has found that a skim-milk supplement gives the best results in height and weight increases among the children. The Baguio nutrition meeting[3] recommended a type of cheap, nutritious, and practical meal for children, adaptable to conditions in different countries, consisting of cereals, pulses, small fish containing bones, green leafy vegetables, and oil (with high carotene content), providing 400 calories and all essential nutrients. The provision of meals at maternal and child welfare centers was advocated. The United Nations International Children's Emergency Fund is at present contributing towards supplementary child-feeding schemes in China, and to a limited extent in several other countries in this area.

The Baguio meeting also recommended the development of nutrition education at three levels, the university, the community professional worker, and the general public, with a practical approach based on knowledge of food habits and local culture. Work on these lines is established in India. In China the Nutrition Aid Council is an active

[3] FAO, *Nutrition Problems of Rice-eating Countries in Asia,* Washington, U. S. A., June 1948.

agency in this direction, and in Siam the Public Health Department is initiating work of this character.

More General Problems

The formidable difficulties which have to be faced in increasing food production and improving nutritional standards are closely related to the more general economic and social difficulties of this region. The inter-relationship of agricultural policy with general economic and social policies has already been stressed in Part I, but it is more clearly apparent in the Far East than in any other region.

Probably the main reason why progress is so slow in disseminating technical knowledge of agricultural practices is the lack in so many Far Eastern countries of the basic educational and health services. In many of these countries there are as yet schools for only a fraction of the children, and expansion is slowed up for lack of trained teachers, buildings, and equipment. In many of these countries a large percentage of the farm population suffers chronically from malaria and other debilitating diseases, and national health services are not yet adequate to deal with the rural areas. In consequence, the farm labor force in many areas is physically unfit for hard work. Another problem is the lack of sufficient training facilities for men to staff the agricultural services, and without agricultural services the national food production programs and the improvement of farming methods cannot be carried through. Mention has also been made in Part I of the changes which need to be made in land tenure, in agricultural credit systems, in inheritance laws, and in marketing arrangements, in order to create a favorable environment for agricultural progress. Also, a part of the new industrial development planned throughout the region should be devoted to providing the necessary materials for agriculture — fertilizers, pesticides, tools, machines, etc. All these things have been written about in many places and the thesis is generally accepted that they are an integral part of the food-supply problem. What is needed is to break through the vicious circle and this can hardly be done by attacking it at any one point alone. The necessary changes must be begun on all fronts simultaneously. The next step is surely to undertake closer examination, probably at the regional level, of how governments can help each other to make a practical start.

Forestry and Forest Products

Although the total area of forests in the region is considerable, so large a proportion of that total is inaccessible that the effective area available to meet the needs of the inhabitants is very small. Governments in this region are faced with the problem of insuring that their forest domain shall be developed to the best advantage of all the people. FAO has made preliminary investigations of existing conditions, and intends to organize a Forestry and Forest Products Conference in 1949 which will deal with the problems of this region and of Oceania. It is hoped that the conference will succeed in pointing the way towards solution of urgent problems and towards the adoption of a general forest policy in which all the countries concerned can participate.

Production

Of the total area occupied by forests, at least one-half is beyond the reach of centers of consumption. The formerly accessible forests have, in many countries, been

extensively exploited for centuries. This is particularly true in China, which suffers severely both from lack of forest products and from the effects of soil erosion which has followed forest denudation. For India and Pakistan together, the area of forest cover is 20 percent of the total, and it is well above 50 percent in Japan, Burma, Ceylon, Malaya, and Indonesia. Most of the forest is broadleaved, conifers being confined to Manchuria, Korea, Japan, and northern India. Among the tropical forests of the region, the teak stands are of exceptionally high value.

Statistics supplied to FAO for 1946 indicate a total production of about 300 million $m^3(r)$, which is much the same as the estimate for 1937.

It is impossible to estimate the outlook for production in the immediate future because of the disturbed political situation, but an energetic attack on the forestry problem in the Philippines suggests that rapid progress can be expected in other countries as soon as political stability is achieved.

Facilities for the production of forest products are, on the whole, inadequate. Much obsolete and inefficient sawmill equipment is still in use. In logging operations a tendency to replace draft animals, including buffaloes and elephants, with mechanical equipment is already in evidence, and will probably develop rapidly when an easing of financial difficulties permits the import of new machinery.

Exports and Imports

Precise data on exports and imports are lacking, but it is estimated that the total net import in 1946 was somewhere between 3 and 4 million m^3. Although the Philippines are preparing for increased exports to North America and teak shipments from Burma and Siam continue, any considerable expansion of either exports or imports must await more stable political conditions.

Consumption

It is estimated that on the average the people of an industrialized country need a per caput supply of wood equal to 700 kilograms. Available figures indicate that the per caput supply in the Far East does not exceed 290 kilograms, a figure which is very low even after allowing for a relatively small degree of industrialization and the warmth of the climate in most parts.

Progress

Many of the Far Eastern countries have had the benefit of good forest services for many years. Notable among these are Burma, India and Pakistan, Indonesia, Indo-China, the Philippines, and Japan. Thus, many highly skilled and experienced forest officers are available. There is, however, a great need for an expansion of technical staffs and for administrative reorganization which will enable foresters to do their best work.

Outstanding forest research institutions exist in India, Malaya, Java, and Japan. There are well-organized technical schools of higher learning in India, the Philippines, China, and Japan, and there are facilities for training subordinate personnel in India, Burma, Malaya, Siam, and Indonesia.

In 1948 an FAO Mission visited Siam and, among other recommendations, made specific suggestions respecting improvements in the management and utilization of the forests. These included recommendations for the increase of trained personnel, im-

proved organization of the forest service, forest finance, the establishment of a national inventory of forest resources, and improved marketing methods.

The time which has elapsed since the end of the war and, in some cases, since the establishment of new governments, is too short to permit the recording of marked advances in forest administration. In some countries internal strife still makes forestry work next to impossible.

In India, Pakistan, and Burma, efforts are being made to establish the forest services of the new governments in such a way as to preserve the fund of experience and skill accumulated during the past and to provide the essential bases for future progress. In the Philippines, Indonesia, and the British territories, great efforts are being made to restore the forest services, which suffered severe losses in personnel and in irreplaceable records during the war. It is hoped that the conference to be held next year will pave the way for mutual co-operation in the solution of the great problems facing this region and for the free interchange of technical information. It should also lead to improved distribution of the available supply of forest products.

THE NEAR EAST

This region[4] is part of the desert belt lying along the Tropic of Cancer. It is characterized by a series of arid high plateaus; large, barren deserts; steppes in need of water to start any agriculture; and few substantial rivers. Rainfall is inadequate for crop production except in the northern areas of Turkey, Iraq, and Iran, along the Mediterranean, in central and southern Sudan, and on the Ethiopian plateau.

In these latter areas cereal production is possible in rotation with fallow. In the alluvial plains and river valleys intensive agriculture, based exclusively on irrigation, is possible. Other parts of the Near East, however, are not adapted to grain-growing under present conditions. It might be that with large-scale mechanization utilizing the best techniques and seeds, and with adequate amounts of fertilizer, many uncultivated areas in the low-rainfall zone could be transformed from grazing steppes to grain farms, but the necessary investments for such projects might be high in relation to the returns. The projects would require large investments in equipment and supplies, most of which would have to be imported since the region is not advanced industrially.

The population of some 119 million is compelled to live densely concentrated in oases. Some of these oases are very large, like the Nile Valley in Egypt (35,000 square kilometers); often they are small, and poor.

The area of arable land can only be roughly estimated because of the relative importance of bare fallow in the different rotations and systems of agriculture and the scanty information available. Excluding Arabia and Afghanistan for lack of data,

[4] The countries included in this region are: Turkey, Iran, Afghanistan, Iraq, Syria, Lebanon, Cyprus, Trans-Jordan, Palestine including Israel, Saudi Arabia, Yemen, other territories of Arabia, the Somalilands, Ethiopia, Eritrea, Anglo-Egyptian Sudan, Egypt, and Libya. Separate data for the new state of Israel are not yet available for all the topics and periods referred to in this Report.

the area of land actually cultivated is estimated at 38 million hectares for prewar and 43 million in 1947. Before the war about 3.6 percent of the total land area was under cultivation, while now this percentage has apparently been brought up to 4.1, an increase of 14 percent. The population has apparently increased in the meantime by almost 16 percent, but a substantial proportion of the increase is very likely consequent upon rationing censuses. For the region as a whole, the ratio of 0.4 hectares of cultivated land per person has probably remained substantially unchanged during the last 10 years.

The predominant problem of the region as a whole is irrigation. The agricultural system of the Near East is deeply influenced by environment and tradition and still maintains basically the pattern developed by the earliest civilizations. This agriculture has some peculiar aspects. First, animal husbandry is divorced from crop-farming and monopolized by the nomads, who live on the seasonal and often meager grazings of the steppes and the plateaus. Sheep, goats, camels, and horses are the most important classes of livestock. The settled farmer raises only a limited number of cattle, camels, donkeys, and mules as draft and pack animals. Beef-cattle breeding is almost unknown. Except in limited areas the production of rotation grasses and feed grain is limited by competition with cash and food crops. Hay production, silos, dairy industry, cattle-fattening, rotation meadows can be seen only in very few districts and on a small scale. Hog-breeding is practically unknown, mainly because of religious taboos; and where it exists, the animals are of inferior quality.

Only at the beginning of the 1920's, with the end of the Ottoman Empire, did this region emerge from a long period in which distances and time were reckoned on the speed of the dromedary caravan. Suddenly the Near East again found itself a cross-road of world trade and traffic. Airways, railways, motor roads have covered it, in less than 30 years, with a gigantic network. Mineral oil is now available in increasing quantities. Oil pipe-lines cross the once mysterious deserts. New ports, new towns, new activities, are growing continually. Modern Turkey is vastly different from the Ottoman Turkey of 30 years ago, and this is also true in degree of all other countries of the region. It is difficult to appraise what sort of agriculture may come out from this economic transformation during the next generation.

Production and Trade

Table 20 summarizes recent trends in production and trade for the major commodities of the region. Production of sugar and tobacco is above the prewar level while production of cotton and oilseeds is lower.

The Near East has increased its agricultural output under the impact of the war. Generally speaking, cash crops were sacrificed and largely supplanted by cereals, pulses, and eventually grasses. The production of meat, milk, eggs, butter, and cheese increased to satisfy mainly the demand of the allied armies on the spot. At present cash crops are expanding again, and if allowed to continue by world demand and increased home consumption, they will reach a new level appreciably above prewar. At present, Egypt is utilizing a surplus of water to expand rice production under the impact of world demand and favorable prices. The water is available because cotton area is still below prewar, and also the improvements introduced in the Nile control have increased its amount. Turkey, Iran, Afghanistan, Iraq, and Syria are increasing their rice area too. This new rice situation has developed in response to the world shortages that have prevailed since the war.

TABLE 20.—PRODUCTION AND TRADE, SELECTED AGRICULTURAL PRODUCTS, IN COUNTRIES OF THE NEAR EAST [1]

Commodity and Country	Production			Trade					
				1934–38			1946/47		
	1934–38	1946/47	1947/48	Exports	Imports	Net	Exports	Imports	Net
	(*Thousand metric tons*)								
Cereals									
Turkey	6,813	6,983	6,204	220	1	−219	449	1	−448
Egypt	4,060	4,223	4,470	119	37	−82	225	47	−178
Others	12,267	13,504	11,896	406	322	−86	601	347	−254
TOTAL	23,140	24,710	22,570	745	360	−385	1,275	395	−880
Olive oil									
Turkey	37	29	65	5	—	−5	—	—	—
Syria and Lebanon	12	12	*15	6	—	−6	*10	—	−*10
Others	11	*9	*25	1	5	+4	1	—	−1
TOTAL	60	50	105	12	5	−7	11	—	−11
Cotton (lint)									
Turkey	55	59	60	18	—	−18	4	—	−4
Egypt [2]	400	273	286	375	—	−375	320	—	−320
Others	*110	*28	*35	72	8	−64	86	10	−76
TOTAL	565	360	381	465	8	−457	410	10	−400
Oilseeds (oil equivalent)									
Turkey	36	22	19	3	2	−1	6	1	−5
Egypt	123	77	87	63	17	−46	3	6	+3
Others	*86	*56	*58	27	16	−11	*31	*18	−*13
TOTAL	245	155	164	93	35	−58	40	25	−15
Dates									
Iraq	*300	295	305	174	—	−174	220	—	−220
Egypt	*200	*90	*90	1	4	+3	1	—	−1
Others	*290	*368	*365	*74	10	−64	*74	*15	−*59
TOTAL	790	753	760	249	14	−235	295	15	−280
Sugar (refined value)									
Turkey	54	97	97	—	20	+20	9	—	−9
Egypt	146	180	210	67	63	−4	1	—	−1
Others	15	33	52	1	213	+212	—	*200	+*200
TOTAL	215	310	359	68	296	+228	10	200	+190
Citrus fruit									
Palestine	340	*350	*485	300	—	−300	222	—	−222
Egypt	235	230	200	7	1	−6	2	—	−2
Others	*135	*200	*190	31	12	−19	*16	*15	−*1
TOTAL	710	780	875	338	13	−325	240	15	−225
Tobacco									
Turkey	55	98	98	29	—	−29	29	—	−29
Iran	15	17	18	—	—	...	—	—	...
Others	*15	*30	*34	2	7	+5	—	13	+13
TOTAL	85	145	150	31	7	−24	29	13	−16

* Unofficial estimates.

[1] Includes all countries of the Near East, as specified in footnote, page 56.

[2] Does not include trade with Anglo-Egyptian Sudan.

Trade has always been essential to prosperity in the Near East. The long Roman peace coincided with the zenith of its prosperity. The region depends by vocation and necessity on trade. Commercial crops are grown mainly for export. Investment in irrigation and other agricultural development is financed from the proceeds of foreign trade. In Arabia and Iraq, for example, improvement of existing agriculture and irrigation may be accelerated by investing the royalties produced by oil exports. The land belongs to the traders, the town-dwellers and money-lenders, the *notables* as they are called, and agriculture is held down with an inescapable burden of debt.

From the information available, it is evident that the foreign trade of the region has changed significantly since the prewar period. Less sugar is imported because production has increased, but more coffee is imported.

Exports of rice are up and are likely to increase further. Exports of cotton are below prewar because of the smaller world demand, increased home consumption, and decreased production. Oilseeds are exported in lesser amounts than prewar, not only because of decreased production but also because of the expanded vegetable-oil industry, which utilizes within the region larger and larger amounts of seeds. Exports of citrus, other fresh and dried fruits, dates, treenuts, and vegetables are not as high as prewar. They still represent in Turkey, Lebanon, Syria, Iraq, Palestine, and Egypt a disturbing surplus problem. These commodities grow exceptionally well in the Near East. Production of them could very easily be increased if there were an adequate demand. A regional technical pool could take care of the experimental work, fumigation, quarantine, and even wrapping and marketing, necessary to the export of standardized high-quality products on a regional basis. Prices of Near East products, as well as quality, can meet competition in foreign markets, especially since much of the produce can be marketed in the off-season in Europe. However, the unsettled political situation delays action in this field, which is one of the most promising potential sources of income.

Of the livestock products, eggs, wool, and casings, as well as small amounts of ghee are still exported. This is another branch of production which could expand in a relatively short time if an export market were assured.

Before the war the production and marketing of cash crops were often financed by European capital and only a relatively small share of the product was processed in the Near East, which used to import products manufactured from its exported raw materials. Now the financing is almost completely national and the proportion of the native products processed on the spot is many times larger than before and is rapidly increasing.

The Near East is industrializing rapidly as a consequence of the war. The new industries are mainly processing the raw materials produced in the region. Instead of exporting oilseeds and importing oils, it is more profitable to process the oilseeds and export oils. The same is true of textiles, hides, and skins. Vegetables are being dehydrated or canned; fruits are canned and fruit juices prepared, especially in Palestine; the processing of dairy products is on the increase. These new industries will create the preliminary conditions for higher standards of living by increasing the purchasing power and making possible a larger consumption of agricultural and fish products.

The absence of German and Japanese goods has created a favorable situation for starting many other small industries besides the above-mentioned ones. The possibilities vary from country to country; at present, the most industrialized countries are Palestine, Turkey, Egypt, and Lebanon.

In Iran, Afghanistan, Arabia, and Ethiopia, the problem of transportation coupled with enormous distances is a very serious hindrance. Only expensive and light goods can travel in these conditions, when the cost of transportation represents a large portion of the price.

Consumption Levels

Very little is actually known, except for Turkey and Egypt (see Tables 21 and 22), about consumption in the Near East. The poverty of statistical information is the main reason, and the impact of strong religious taboos on diet does not simplify the problem of inquiring and estimating.

TABLE 21.—NUTRITIVE VALUE OF FOOD SUPPLIES IN TURKEY AND EGYPT, PREWAR, 1946/47, AND 1947/48

Country and Period	Calories		Protein			Fat
	Daily per Caput Consumption	Percentage from Cereals and Starches	Daily Supply per Caput		Animal Protein Related to Total Protein	Daily Supply per Caput
			Total	Animal		
	(*Number*)	(*Percentage*)	(....*Grams*.....)		(*Percentage*)	(*Grams*)
Turkey						
1934–38	2,554	71	78.7	15.2	19	46.8
1946/47	2,305	73	70.9	11.8	17	42.5
1947/48	2,087	72	64.7	12.2	19	45.5
Egypt						
1934–38	2,469	71	76.7	12.5	16	41.3
1946/47	2,404	73	74.6	12.8	17	39.7
1947/48	2,389	73	71.7	12.7	18	40.8

Besides, consumption levels are strikingly different according to the different groups. The nomads live mainly on barley, dates, milk, and meat, while the sedentary farmers consume essentially cereals, olive oil, fruit, and very little meat. The poor people in the towns are often underfed and their diet consists mainly of cereals, pulses, fruit, some fish, vegetables, and very little meat; however, they can get olives, nuts, honey, and molasses.

TABLE 22.—PER CAPUT SUPPLIES OF MAJOR FOODSTUFFS IN TURKEY AND EGYPT, PREWAR, 1946/47, AND 1947/48

Country and Period	Cereals[1]	Roots, Tubers, and Starches	Sugar	Pulses and Nuts	Fruits and Vegetables	Fats	Meat	Milk and Cheese	Eggs	Fish
	(.....*Kilograms per caput per year*.....)									
Turkey										
1934–38	190.9	2.7	5.2	9.9	120.7	8.6	13.5	35.3	2.7	2.0
1946/47	175.7	5.1	5.2	6.1	108.6	7.7	13.2	36.6	2.0	1.9
1947/48	155.3	6.0	5.6	7.0	57.9	9.6	14.0	34.9	2.0	2.2
Egypt										
1934–38	182.1	3.9	13.5	21.5	48.8	2.8	7.3	69.0	1.7	3.0
1946/47	179.8	6.1	11.9	18.1	52.4	2.8	8.5	69.2	1.6	3.0
1947/48	177.8	6.9	13.3	16.2	46.6	3.0	8.2	69.1	1.5	3.0

[1] Milled basis.

There is no evidence to show that any general changes in the health and nutritional status of the people in the Near East have come about during 1947/48. In this region only very limited systematic surveys have been made of dietary habits, food consumption levels, and nutritional status, but undernutrition and malnutrition are to be found, and deficiency diseases occur associated with parasitic infections and other diseases. Chief causes are the marked inequalities in distribution of food, the poverty of various groups, and the traditions and habits which result in unbalanced diets and poor utilization of the available supplies of food.

Plans and Programs

Possibilities of increasing the crop area are limited by the amount of water available when it is most needed. All development projects involve irrigation and cash crops, i.e., fibers, fruit, sugar, and oilseeds, and all are necessarily long-term propositions. At the Cairo meeting in February 1948, Egypt presented a ten-year plan for bringing 10,000 additional hectares each year under basin irrigation, and further proposals for irrigation which would benefit some 20,000 hectares. Iraq has a five-year program for increasing the irrigated area by 240,000 hectares; Syria could irrigate 100,000 hectares in the Euphrates Valley; and Lebanon has already started upon a project for irrigating close upon 40,000 hectares. All these countries have indicated that the initiation of these projects is contingent upon obtaining the necessary equipment from abroad. There may be much larger potentialities of development; additional surveys are necessary to determine their economic feasibility.

In most countries of the Near East national budgets are limited and do not provide for investment of enough money in inquiries and statistical work for which there is little or no national demand. Besides, the technical agencies of these governments are not yet sufficiently skilled for such activities and do not have adequate personnel. However, FAO was invited to establish an agricultural statistics training center in Baghdad for a period of three months early in 1948. The trainees were officials nominated by their governments, and the purpose was to provide them with a better working knowledge of statistical method and in particular with the assembly and processing of agricultural statistics. A statistical adviser has also been working with the Turkish Government.

Only Turkey, which is among the countries of the ERP, has made an attempt to prepare a comprehensive agricultural plan with specified production targets. This plan aims first at increasing the exportation of grain, dried fruit, pulses, and tobacco and decreasing the importation of sugar.

Some of these countries are endeavoring to increase hydroelectric power generation and to produce fertilizer. Egypt is building a hydroelectric power station at the Aswan Dam and two plants for the production of nitrogenous fertilizer, which is not adequately available at present. But farm machinery and irrigation equipment are the most badly needed items throughout the region.

Nonetheless, all the governments of this region are actively studying and planning in an effort to improve their agriculture. From land tenure, farm credit, agricultural co-operation, and extension work, down to the innumerable problems arising from water disposal and rights, village surveys and resettlement, organization of shelter, shade, and wells for nomad livestock, and all the aspects of agricultural organization, management, protection, marketing, and consumption, questions of food and agriculture are debated with new interest by parliaments and the public. But even so, all these coun-

tries have only general or promotional projects to improve the general standard of living of the people, to increase production, to better health conditions in the villages, or to fight against unemployment and distribute uncultivated land to farm labor.

Improving Nutrition

The problem of improving nutrition in these countries has in few instances been faced on a national scale. There are many factors to be taken into account, not the least of which are poverty, poor food habits, and lack of modern facilities.

Some programs have been introduced to make provision for a better use of the available food supplies. In some areas there are limited food-control measures and allowance of food at subsidized prices. These relate principally to cereals. In Egypt there have been supplementary feeding schemes for a considerable number of years. The Compulsory Education Act, recently introduced, includes school meals as a standard benefit. "Social kitchens" have also been organized to provide workers with meals. In Egypt, too, there is a Standing Committee on Nutrition, and recently a Nutrition Society has been formed.

One of the limiting factors has been the lack of trained personnel to carry out investigations and bring the need for nutrition activity before the authorities. FAO is arranging the establishment of a nutrition center in Egypt to train personnel from the various countries of the region.

Another promising development is in Ethiopia, where the ministries of health and education, with technical help from other countries, are starting a project to improve teaching and practice in the field of human nutrition. It is hoped that FAO may be able to assist in this task.

Forestry and Forest Products

In this region, as in the Far East, the existing state of political unrest hinders the development of better forest administration. The situation is particularly grave because the region suffers more severely than any other from the lack of forests and the protective influence which they could exert. In most of the countries concerned forest services are lacking or are only in the preliminary stage of development, and it will be necessary to create concurrently new forests and the means for administering them.

The percentage of forested area is the smallest in the world. In Trans-Jordan less than one-half of 1 percent of the land bears tree cover, and in large parts of the Arabian Peninsula the percentage is believed to be even smaller. There is no region where the lack of forests so severely curtails the development of agriculture, conservation of the soil and water supplies, and, in general, development of better economic and social standards of living. Uncontrolled overcutting in the past is responsible for the destruction of important forest areas, overgrazing today prevents the development of new forests, and lack of interest and knowledge of the benefits to be obtained from forestry combine to prevent progress.

Production

Most of the forests that exist are to be found in Turkey and Iran around the Black Sea and the Caspian Sea in the north, and in parts of Ethiopia and the Anglo-Egyptian Sudan in the south. Even though part of this latter country is sometimes

referred to as heavily forested, it must be noted that only 4 percent of these forests can be considered as productive.

It is impossible to estimate the actual yield of forest products in this region and to compare it with actual growth. In 1945 production figures were available only for the Anglo-Egyptian Sudan, Cyprus, and Lebanon, the total yield for these three countries amounting to 360,000 $m^3(r)$. Even if total growth could be estimated, it would have little meaning, for very large but unknown deductions would have to be made to account for losses from fire, insects, and grazing. In any event, the forestry output of the Near East is too small to be of interest from a world-wide point of view.

Exports and Imports

Traditionally this region is dependent on Europe for its timber supplies. In 1946 Egypt alone imported the equivalent of 430,000 $m^3(r)$ of forest products. During the last few years imports into the rest of the region have been curtailed to an almost negligible figure but, when stability is re-established, the timber needs of the Near East may constitute a considerable drain on the production of European forests.

Consumption

Consumption of forest products in this region is the lowest in the world, being estimated at only 60 kilograms per caput in 1946. In some individual countries it is only one-fourth of that amount. It is obvious that development of greater industrialization in this region would involve import of the necessary timber from other parts of the world.

Progress

There is some evidence that certain countries of the region are awakening to the importance of forests to their economies. Lebanon has formulated an afforestation program. The Ethiopian Government has been advised by a special mission from the United States of America as to the best ways of handling its forestry problems, and may request assistance from FAO in carrying out its plans of development.

The only country with a comprehensive forestry program is Turkey. Before the war this country already had a well-organized forest service and good forestry legislation. It has also developed a large program for afforestation. Recently, Turkey has asked the advice of a foreign specialist regarding improvement of its organization and especially regarding the institution of an inventory of its forest resources.

Progress in forestry has been negligible during the past year. FAO hopes to organize a forestry mission in 1949, which will be able to advise governments regarding their forest problems and the first steps which should be taken for dealing with them.

Chapter 9

LOWER-INCOME, SPARSELY POPULATED REGIONS

LATIN AMERICA

THIS region[1] is in a phase of rapid economic expansion. Between 1934-38 and 1947 the population increased at the rate of 2 percent per annum; agricultural production in the countries analyzed in this section[2] expanded by 20 percent and the industrial production of Latin America almost doubled. This broad economic expansion represents a continuation of the trend already strong during the 1920's and '30's. A high level of employment, the increased urbanization and the growth in real income per person have created a strong local demand for food. The increase in food production, although considerable, has not been enough to meet this demand fully; it has also been necessary to curtail food exports and increase food imports.

Will these trends persist? Will Latin America's net contribution to the world's food supply (i.e., the balance of its exports over its imports of food) continue to diminish or could the expansion of agricultural output be accelerated to take care of the internal demand and to provide more substantial export surpluses?

In the following pages only the beginnings of a reply are formulated. The available evidence is altogether too fragmentary. In a number of countries few agricultural statistics are regularly collected and compiled. To form an adequate idea of Latin America's agricultural problems, more basic work needs to be done at the technical level in the countries of the region.

Production and Trade

General

Food production levels are in general well above the 1934-38 average (see Table 23). The commodities in which the largest gains have been achieved are: rice, of which production has expanded in almost all the Latin-American countries; potatoes, in all of the producing countries; sugar, principally in Cuba, Mexico, Brazil, Puerto Rico, and Argentina; and oilseeds, especially in Argentina and Mexico. Numbers of

[1] The area termed Latin America in this report is the entire geographic region of the Western Hemisphere south and southeast of the United States of America comprising Mexico, Central America, South America, and the Caribbean area. It includes not only the 20 Latin-American republics, but also the British, French, Dutch, and U. S. possessions within the region.

[2] Countries for which it has been possible to construct food balance sheets are: Cuba, Mexico, Argentina, Brazil, Chile, Colombia, Peru, and Uruguay.

cattle, sheep, and hogs are also well above prewar levels for the region as a whole, and the increases have been common to most countries.

In 1947/48 there were further substantial gains over the previous year for most countries and most major crops. A notable exception was for rice, production of which decreased as a result of a smaller area for the 1948 harvest in Brazil, the largest rice producer in the region. Numbers of sheep increased between 1946 and 1947, but numbers of cattle and hogs did not change significantly.

TABLE 23.—PRODUCTION OF SELECTED AGRICULTURAL COMMODITIES IN LATIN AMERICA, 1934–38, 1946, AND 1947

Commodity	Argentina			All Others			Total		
	1934–38	1946	1947	1934–38	1946	1947	1934–38	1946	1947
	(*Thousand metric tons*)								
Wheat	6,634	5,615	6,664	1,982	2,046	2,548	8,616	7,661	9,212
Maize	7,892	5,815	6,500	9,744	10,820	11,100	17,636	16,635	17,600
Meat	2,122	2,302	2,577	3,393	3,523	3,581	5,515	5,825	6,158
Peanuts	79	107	100	37	96	121	116	203	221
Sunflower seed	154	688	1,074	2	53	84	156	741	1,158
Linseed	1,702	1,034	943	92	96	130	1,794	1,130	1,073
	Brazil			All Others			Total		
Cottonseed	816	685	510	419	426	430	1,235	1,111	940
	Cuba			All Others			Total		
Sugar [1]	2,837	5,848	6,100	4,240	5,642	5,756	7,077	11,490	11,856

[1] The figures refer to crop year beginning in September of the year indicated.

The international trade of Latin America before the war was principally with European countries, first the United Kingdom, next Germany, and then France. The direction of Latin-American trade shifted during the war toward a stronger relationship with the United States and toward increased trade among Latin-American countries. Trade among the Latin-American republics has increased steadily in recent years—from approximately 8 percent of total trade in 1939 to 21 percent in 1945.

In 1939, 46 percent of the exports of Latin America went to Europe and 36 percent to the United States of America. In 1945, the latest year for which these regional trade statistics have been compiled, 20 percent went to Europe and 49 percent to the United States. The trend has been somewhat stronger in the case of imports; 42 percent of the Latin-American imports came from Europe in 1939 and 40 percent from the United States, as compared with 10 percent and 59 percent respectively in 1945. Since 1945, trade with Europe has made up a higher percentage of the total trade, but it seems likely that, for several years at least, trade with the United States will be relatively more important than before the war. Latin America needs industrial products and cannot now get them from its prewar suppliers because industrial production has not recovered sufficiently in Germany, Japan, and some other countries. The Latin-American countries must turn to the United States, whose manufacturing industries are producing at high levels. And in view of the necessity of paying for these imports with dollars, Latin America will try to maintain high exports to the

United States or require European importers of Latin-American products to pay in dollars.

The countries which send most of their agricultural exports to the United States are found in the Caribbean area and Central America. The nations of northern South America—Colombia, Ecuador, and Peru—also send tropical commodities to the United States, but less in relationship to their total exports than do the Central American and Caribbean countries. The southernmost countries of this continent, Argentina and Uruguay, produce commodities so much in competition with products of the United States that they look to Europe and other Latin-American countries for their markets.

TABLE 24.—INTERNATIONAL TRADE IN SELECTED LATIN-AMERICAN COUNTRIES

Commodity and Country	Gross Imports			Gross Exports			Net Trade (Imports + Exports −)		
	1934–38	1946	1947	1934–38	1946	1947	1934–38	1946	1947
	(*Thousand metric tons*)								
Wheat and wheat flour									
Central America and Caribbean	382	783	751	—	—	—	+ 382	+ 783	+ 751
Argentina	—	—	—	3,340	1,443	2,303	−3,340	−1,443	−2,303
Other South America	1,342	1,029	1,545	109	1	—	+1,233	+1,028	+1,545
TOTAL	1,724	1,812	2,296	3,449	1,444	2,303	−1,729	+ 368	− 7
Coarse grains									
Argentina	—	—	—	7,229	3,189	3,009	−7,229	−3,189	−3,009
Others	55	112	168	191	184	204	− 136	− 72	− 36
TOTAL	55	112	168	7,420	3,373	3,213	−7,365	−3,261	−3,045
Rice									
Brazil	—	—	—	54	152	213	− 54	− 152	− 213
Ecuador	—	—	—	12	67	66	− 12	− 67	− 66
Cuba	201	137	282	—	—	—	+ 201	+ 137	+ 282
Others	327	79	92	35	67	24	+ 292	+ 12	+ 68
TOTAL	528	216	374	101	286	303	+ 427	− 70	+ 71
Sugar									
Cuba	—	—	—	2,560	3,723	5,583	−2,560	−3,723	−5,583
Other Central America and Caribbean	19	135	28	1,551	1,529	1,621	−1,532	−1,394	−1,593
South America	223	299	260	662	511	618	− 439	− 212	− 358
TOTAL	242	434	288	4,773	5,257	7,822	−4,531	−5,329	−7,534
Meat[1]									
Argentina	—	—	—	689	672	763	− 689	− 672	− 763
Others	12	10	10	277	283	155	− 265	− 273	− 145
TOTAL	12	10	10	966	955	918	− 954	− 945	− 908
Oilseeds[2]									
Argentina	—	—	—	1,526	55	—	−1,526	− 55	—
Others	102	33	17	326	201	217	− 224	− 178	− 200
TOTAL	102	33	17	1,852	256	217	−1,750	− 223	− 200
Vegetable oils[3]									
Argentina	18	—	—	—	237	297	+ 18	− 237	− 297
Others	39	14	10	26	58	50	+ 13	− 44	− 40
TOTAL	57	14	10	26	295	347	+ 31	− 281	− 337

[1] Includes beef and veal, mutton and lamb, and pork in terms of carcass weight.
[2] Includes linseed, cottonseed, sunflower seed, castor seed, rapeseed, peanuts, and copra; seed weight.
[3] Includes linseed oil, cottonseed oil, sunflower seed oil, coconut oil, olive oil, and others.

The future of the export trade of these countries will depend in large part on their ability to absorb the commodities Europe can export.

The significant postwar change in Latin-American trade in agricultural products in addition to that in direction is in volume (see Table 24). Net sugar exports increased from a prewar average of 4.5 million tons to 7.5 million tons in 1947. During this period Cuban exports increased by about 3.0 million tons or virtually the same amount as that by which total net exports of the continent increased. Gross exports of rice increased from a prewar average of about 100,000 tons to about 300,000 tons in 1947, but this only served to take care of needs within the region with the result that the region as a whole became very nearly self-sufficient in rice. Net meat exports are at approximately the prewar level of just over 900,000 tons.

For most of the other major foodstuffs, exports are well below the prewar level. Net wheat exports of 1.7 million tons in the prewar period had practically disappeared in 1947, when the region was just self-sufficient. Net exports of coarse grains were reduced from 7.4 to 3.0 million tons. Net exports of vegetable oilseeds and oils (in fat equivalent) decreased significantly. Thus on balance Latin America is currently contributing less to the food supply of other regions than before the war.

Selected Countries

Argentina's greatest increases in food production since prewar have been in meat and edible oils. Meat output in 1947 was 20 percent above prewar. Total oilseed production showed a big shift from linseed to sunflower seed. The 1934-38 sunflowerseed production averaged 154,000 tons, which rose to 1,074,000 tons in 1947/48. Linseed production is declining and in 1947/48 was 943,000 tons as compared with the prewar average of 1,702,000 tons.

Argentina is favoring its livestock industry in part at the expense of wheat production. The area planted to wheat in 1947 was 1.2 million hectares lower than in the previous year. Extraordinarily high yields made possible a higher production, but still about the same as the prewar average. Table 25 shows the area and production of cereals in Argentina in 1934-38, 1946/47, and 1947/48.

Argentina, the leading exporter of cereals, meats, and edible oils in the region, was forced to reduce its level of exports considerably during the war. Of the important items, only meat exports maintained their high volume. In 1947, the exports of meat were 15 percent above the 1935-39 average. Cereal exports from Argentina declined sharply from a 1935-39 average of 10.1 million tons to 2.4 million tons in 1943, and have since recovered to 4.9 million tons in 1946 and 5.7 million tons in 1947.

TABLE 25.—AREA AND PRODUCTION OF CEREALS IN ARGENTINA, PREWAR, 1946/47, AND 1947/48

Cereal	Harvested Area			Production		
	Average 1934–38	1946/47	1947/48	Average 1934–38	1946/47	1947/48
	(*Thousand hectares*)			(*Thousand metric tons*)		
Wheat	6,783	5,619	4,717	6,634	5,615	6,664
Rye	434	923	701	254	552	521
Barley	536	982	660	503	1,171	834
Oats	794	805	667	748	684	801
Maize	4,362	2,602	2,667	7,892	5,815	6,500
TOTAL	12,909	10,931	9,412	16,031	13,837	15,320

Until recently Argentina exported large amounts of linseed, smaller quantities of other oilseeds, and some oil. The big switch in production from linseed to sunflower seed has been made to meet the expanding domestic demand for edible oil. Furthermore, whatever surpluses of oilseed remain for export now go to the newly established crushing mills and are exported in the form of oil and oilcake.

In *Brazil* production of rice and sugar increased substantially in 1947, rice to 100 percent and sugar to 50 percent above the prewar average (but rice has declined in 1948). Production of vegetable oils was about the same in 1947 as in the prewar period, except that cottonseed output has declined and production of castor beans and peanuts has increased. Peanut production in 1947 was double the prewar average. Coffee production in 1947 at 903,000 tons remained somewhat below the prewar average, although not so low as during the war years when it was sometimes near 700,000 tons. With the aim of reducing imports, Brazilian wheat production has been doubled since prewar.

In *Chile* the greatest increases in 1947/48 were in sunflower seed, wheat, and rice, although output of almost all the other major crops increased also. In the prewar period, no sunflower seed was produced, but in 1947/48, 32,000 tons were harvested. The 1947/48 wheat crop was the first ever to exceed a million tons, and this was made possible by record yields. The 1947/48 rice crop was three times the 1934-38 average. As for the Chilean export crops of pulses, oats, and barley, production was reduced during the war as some markets for the exports were cut off. They have now nearly recovered the prewar levels. Fish production was increased from 40,000 tons in 1946 to 46,000 tons in 1947.

Uruguay suffered from a severe drought in 1943 that reduced livestock numbers by 15 percent. Since then it has been impossible to restore prewar numbers, and consequently meat production has been declining and in the last two years has been 30 percent less than in the prewar period. The 1947/48 production of cereals, with large areas planted and outstanding yields, reached a record level, almost double the poor crops of 1946/47 and 25 percent higher than the 1934-38 average. Wheat production was 457,000 tons compared with 182,000 tons in 1946/47 and a prewar average of 365,000 tons. Much larger areas were sown with oilseeds in 1947; as much as 20 percent above the previous year in the area of linseed and 100 percent for peanuts, a much smaller crop.

In *Colombia* production of cereals, sugar cane, and potatoes has risen well above prewar levels. In 1946 wheat production was 120,000 tons as compared with 110,000 in the prewar period; the potato crop yielded 460,000 tons, 75 percent above the prewar average; and cane sugar production was almost twice the prewar level.

Sugar production has also expanded in *Peru,* where the output in 1947 was 412,000 tons or 7 percent above prewar. Wheat production in 1946 was 50 percent above prewar.

Mexico has achieved a remarkable increase in crop production. The total area of crops in 1947 was 30 percent above the 1934-38 average. Approximately 1.7 million hectares have been put into cultivation during the last decade. The production of maize, the staple food commodity in Mexico, has been increasing steadily since the prewar period. Production in 1947 was 2.6 million metric tons as compared with 2.4 million tons in 1946 and a prewar average of 1.7 million metric tons. Total production of rice, wheat, and barley in 1947 was 10 percent higher than in the previous year and 26 percent higher than the 1934-38 average. In 1946 the prewar production

of cane sugar was almost doubled, in 1947 the production was 20 percent higher than the previous year, and in 1948 some is available for export. In spite of the increases, Mexico has deficits in wheat, maize, beans, and edible oils.

In the six Central American countries south of Mexico, production of bananas and coffee dominates agriculture, and exports of these crops support the national economies. Production of fruits and vegetables has expanded, especially in Panama and Costa Rica, and rice output has risen sharply in all of the countries. Total Central American rice production in 1947 was about 100 percent greater than the 1934-38 average. Coffee prices have been favorable for several years, and production is increasing. Banana production in Central America, however, dropped severely during the war owing to scarcity of shipping, but by 1947 it had recovered to near prewar levels.

The high demand for the sugar of the Caribbean countries has brought about an increase in production there from the 1934-38 average of 4.5 million tons to about 8 million tons in 1947/48. Of this increase 3.3 million tons was in Cuba, and most of the remainder in Puerto Rico and Jamaica.

Consumption Levels

Latin America is characterized by striking contrasts in diets—from the rich and generally adequate supplies in Argentina, to the very unsatisfactory ones in most of the countries located in the tropics. Wide variation in diets is also found within countries among different economic, social, and racial groups. There is evidence that food-consumption levels have improved somewhat over prewar, as a result of a general increase in purchasing power.

On the basis of available official information on food consumption, it has been possible to make food balance sheets for eight countries which together represent about four-fifths of the total population of the area. The resultant data must be used with reserve, since there are undoubtedly errors due to unsatisfactory estimates of production, either in the absence of official estimates or in cases where official estimates are incomplete because of the difficulty of evaluating the volume of food output in subsistence farming regions. (See Tables 26 and 27.) Additional error is likely in estimating the utilization of the total supply for food and non-food purposes.

Average food supply levels in the eight countries studied appear to have increased from about 2,200 calories per person per day in the prewar period to 2,400 calories in 1947. But there are extreme variations from the regional average for 1947. Argentina is estimated to have an average of more than 3,100 calories; Peru, 1,900.

If Argentina and Uruguay were to be excluded, one could safely generalize the diet picture by describing it as extremely deficient. Protein intake is extremely low. Calories derived from meat in Chile are 200 per day, but in the other countries are well below 200, and in no instance is there enough of such foods as milk, eggs, and fish. One practical possibility of reducing this deficiency might be more emphasis on the fishing industries, which would add animal protein and some calcium to the diet. Since so much of this region is either tropical or subtropical, it will be difficult for the people to reach an adequate level of consumption of livestock products from indigenous sources.

For the whole region, the proportion of total calories from carbohydrates is excessively high. Cereals and tubers alone provide about 50 percent of the total calories, and are supplemented too heavily by starchy fruits and roots.

Maize is the most important single food item in Mexico, Guatemala, Colombia, Venezuela, Peru, and Ecuador, but its consumption has decreased during the past few years while that of wheat has increased. In Brazil manioc is more important than all the cereals. Rice is the chief food in most of the Central American and Caribbean areas and in the Guianas. The average amount of rice consumed in these areas varies from 23 to 122 kilograms per caput per year, although the average consumption for the whole of Latin America is only about 17 kilograms. Wheat is the principal cereal in Argentina, Chile, and Uruguay.

TABLE 26.—PER CAPUT SUPPLIES OF MAJOR FOODSTUFFS IN SELECTED LATIN-AMERICAN COUNTRIES, PREWAR, 1946, AND 1947

Country and Period	Cereals and Cereal Products[1]	Roots, Tubers, and Other Starchy Foods	Sugars and Syrups[2]	Pulses and Nuts	Fruits	Vegetables	Fats and Oils[4]	Meat[3]	Milk and Cheese	Eggs	Fish and Shellfish
	(*Kilograms per caput per day at the retail level*)										
Central America and Caribbean											
Cuba											
1934–38	104.0	98.8	40.0	12.5	148.1	15.6	8.8	33.5	70.6	4.4	4.2
1946/47	103.9	86.9	43.0	13.3	142.0	14.3	11.9	37.5	67.7	3.4	5.5
1947/48	107.3	91.5	41.8	14.3	124.6	14.1	13.5	38.2	75.5	3.1	5.9
Mexico											
1934–38	101.9	4.7	23.1	14.4	54.8	16.5	4.9	26.3	79.9	2.0	3.6
1946/47	119.0	7.4	31.4	15.5	55.1	22.0	5.5	26.0	68.6	2.2	5.0
1947/48	122.3	7.3	32.9	17.7	58.6	21.6	6.0	24.5	68.5	2.0	5.0
South America											
Argentina											
1935–39	108.1	70.6	27.2	2.5	47.2	24.5	9.8	107.6	140.4	7.1	4.5
1946	117.3	95.5	34.2	3.0	66.6	39.0	14.3	107.7	109.2	7.3	3.6
1947	118.7	77.8	34.9	3.4	61.1	39.2	15.7	118.9	114.6	7.3	3.8
Brazil											
1935–39	80.3	45.7	24.7	22.8	68.0	20.0	5.1	52.5	75.2	2.6	1.4
1946	81.6	55.0	32.2	21.0	74.3	23.7	5.9	40.2	75.2	2.6	2.8
1947	83.6	54.1	31.0	21.6	75.6	23.9	5.9	42.2	73.4	2.6	2.9
Chile											
1935–39	129.3	72.4	25.6	10.8	34.1	18.0	4.5	35.0	62.8	1.7	7.2
1946	123.9	93.3	25.2	5.1	35.3	21.0	5.0	38.7	80.5	1.8	11.3
1947	132.2	80.7	25.1	9.6	35.8	21.0	4.4	35.2	80.0	1.8	11.2
Colombia											
1935–39	51.9	82.1	59.7	7.0	137.1	10.3	3.7	27.9	69.0	5.7	0.6
1946	63.6	99.6	78.0	7.8	114.3	11.9	3.1	27.3	91.3	4.8	0.5
Peru											
1935–39	98.2	88.9	13.6	15.6	42.4	13.6	3.7	24.0	27.7	3.2	0.9
1946	96.8	87.2	21.2	8.4	43.8	14.3	3.9	22.3	25.8	3.2	1.3
1947	102.6	100.2	22.4	6.9	42.6	14.0	3.6	22.6	26.1	3.3	1.3
Uruguay											
1935–39	85.2	41.3	24.0	2.5	29.3	9.8	13.6	103.7	148.5	7.4	1.9
1946	92.9	31.1	29.8	1.8	39.1	12.3	11.6	86.3	160.0	8.3	2.2
1947	92.5	49.5	30.0	2.0	39.5	13.9	10.3	95.6	161.6	8.3	2.3

[1] Milled basis.
[2] Including panela, papelon, and piloncillo.
[3] Including poultry, game, and offal.
[4] Includes vegetable oils, butter, and other animal fats; pure fat basis.

TABLE 27.—NUTRITIVE VALUE OF FOOD SUPPLIES IN SELECTED LATIN-AMERICAN COUNTRIES, PREWAR, 1946, AND 1947

Country and Period	Calories		Protein			Fat
	Daily Supply per Caput	Percentage from Cereals and Tubers	Daily Supply per Caput		Animal Protein Related to Total Protein	Daily Supply per Caput
			Total	Animal		
	(*Number*)	(*Percentage*)	(.....*Grams*.....)		(*Percentage*)	(*Grams*)
Central America and Caribbean						
Cuba						
1934–38	2,626	49	62.1	23.3	37	48.6
1946/47	2,708	47	65.1	25.6	39	57.1
1947/48	2,772	47	67.1	26.5	39	60.9
Mexico						
1934–38	1,855	55	56.2	19.8	35	42.9
1946/47	2,122	55	61.0	18.8	31	44.6
1947/48	2,206	55	61.2	17.4	28	46.2
South America						
Argentina						
1935–39	2,777	50	99.7	62.0	62	92.9
1946	3,087	50	103.4	60.6	59	102.0
1947	3,162	43	108.9	66.0	61	109.0
Brazil						
1935–39	2,173	48	67.6	30.4	45	51.7
1946	2,291	50	61.3	25.3	41	47.0
1947	2,299	50	63.7	26.2	41	48.4
Chile						
1935–39	2,322	61	70.5	22.1	31	42.9
1946	2,327	61	70.6	26.2	37	43.7
1947	2,393	61	73.5	24.7	34	43.0
Colombia						
1935–39	2,004	37	46.0	20.7	45	42.9
1946	2,324	39	52.0	22.5	43	45.3
Peru						
1935–39	1,835	63	54.6	13.0	24	39.1
1946	1,813	62	49.2	13.0	26	37.1
1947	1,891	64	50.9	13.0	26	37.0
Uruguay						
1935–39	2,426	45	88.7	28.7	32	94.7
1946	2,445	41	83.3	30.2	36	86.3
1947	2,499	42	88.6	31.0	35	86.3

Pulses are the chief substitute for meat in many Latin-American countries, and only Argentina, Uruguay, and Paraguay have an adequate meat supply. Dairy products are relatively more important in these same three meat-producing countries, but they occupy a small place in the diet of the others. Milk products are consumed mainly by the higher-income people. Supplies of vegetables and fruits are deficient in most Latin-American countries. In Mexico, Guatemala, Ecuador, Bolivia, and Peru wild or primitively cultivated plant products make important contributions to the diet of the rural population. The consumption of fats and oils is low in most Latin-American countries except Argentina and Uruguay.

There is no evidence to show that there has been any general change in the nutritional status of the people of Latin America during 1947/48. Nutrition problems in this region remain serious and widespread. Vital statistics that are available show that the average expectations of life are among the lowest in the world (e.g., Chile, 1940—37.9 years for males, 39.8 years for females; Columbia, 1939-41—30

years for males and females combined). Infant mortality rates in most countries of the region are high:

	Per 1,000 Live Births
Guatemala	1946—114
Peru	1945—112
Chile	1946—160
Colombia	1945—151

Deficiency diseases associated with the low intake of vitamins and minerals are to be found, and there is undernutrition and malnutrition as evidenced by retarded growth in children and poor physical development of adults. The condition of younger children, the 1-6 year age group, is in several areas extremely grave.

Increasing Supplies

At first sight it would appear comparatively easy to increase food production in Latin America. This continent seems to have one of the most favorable relationships between population and resources of any in the world. As Table 28 shows, there are some 13.5 hectares of land per person, and at the moment only 3 percent of the total area is cultivated.

TABLE 28.—TOTAL TERRITORY, ARABLE LAND, AND AMOUNT PER INHABITANT IN LATIN AMERICA, 1946

Country	Total Territory	Arable Land		Amount of Land per Inhabitant	
		Area	Percentage of Total Territory	Total	Arable
	(*Thousand hectares*)	(*Thousand hectares*)	(*Percentage*)	(.....*Hectares*.....)	
Argentina	279,270	27,000	9.7	17.34	1.68
Brazil	851,119	15,630	1.8	17.90	.33
Chile	74,177	1,429	1.9	13.42	.26
Colombia	113,836	2,709	2.4	10.80	.26
Cuba	11,439	1,970	17.2	2.25	.39
Mexico	197,845	6,269	3.2	8.60	.28
Peru	124,905	2,000	1.6	15.77	.25
Uruguay	18,693	991	5.3	1.12	.43
Others	397,461	7,602	1.9	11.51	.22
TOTAL OR AVERAGE	2,068,745	65,600	3.2	13.56	.46

Within the region conditions vary greatly—a high density of population in the Caribbean and very sparse population in Argentina. Indeed, leaving aside Argentina, which contains 45 percent of the cropland of Latin America, the amount of cropland per person in the rest of the region is rather less than the amount per person in India/Pakistan. Only comparatively small portions of Latin America have been settled and cultivated and in these small areas the population is crowded and the farm holdings are small.

There are two questions; the first is whether, say, another 3 percent of the total land surface of this region could be brought into cultivation; the second is whether the present cropland and pasture could not become more productive. Many physical, political, and economic factors limit expansion of the agricultural area of Latin America. The political and economic factors are, briefly, political instability, lack of capital investment, the instability of world demand, and the scarcity of farm labor and machinery.

And since labor is likely to remain scarce, despite some immigration, a larger supply of machinery seems necessary if more land is to be brought into use.

The farm machinery supply situation has in the past few years become very difficult. Scarcely any farm machinery is produced in Latin America, and so the countries depend on imports, especially from the United States and Canada. These imports were negligible during the war, and although more now, they are not increasing as much as the Latin-American nations had hoped, because the demand for farm machinery in North America is so great. As a result, the equipment of the Latin-American countries is badly run down and agricultural expansion is handicapped.

As for the physical limitations, about three-fourths of Latin America is located in the tropics; and in the southernmost part of the continent, the cold is so severe that it limits agricultural activity considerably. Sharp contrasts appear in the distribution of rainfall, ranging from the territories of extreme rainy tropics to large areas of desert land.

The only large expanse of level land with both good soils and good climatic conditions is the Argentine Pampas. Argentine Patagonia is fairly level but does not have adequate rainfall, and this area does not even provide satisfactory grazing land. In Brazil, the high plateau northwest of Rio de Janeiro, although relatively level, has poor soils and deficient rainfall. Northeastern Brazil is subject to severe droughts, and the Amazon Basin is a dense rain forest. Not much is known about the quality of the soils in this area, but hitherto the intense heat, rainfall, and mosquitoes have prevented development of any real agriculture.

A slow but constant process of soil erosion from the uplands has been gradually extending the coastal plains of Central and South America, but in many parts these plains suffer from excessive heat and rain—and, in addition, incidence of tropical diseases is high. The cool highlands of Mexico are subject to wide variations in rainfall and temperature, and the value of the soil has been heavily depleted by excessive cropping. Most of northern Mexico is desert. The only other considerable level area is the "Llanos" of Venezuela. Soils here are poor, and rainfall too heavy in some months of the year and too light in other months.

Despite these various limiting factors, there are reported to be considerable stretches of land in districts of suitable rainfall and temperature which remain unsettled or sparsely settled and which could be transformed into good cropland, and there are also many sections of land which could be made cultivable by irrigation, reclamation, or soil improvement. More field investigations are needed in order to determine what might be done in each country.

The second approach is to increase production by more effective use of the land now in cultivation and by improving the quality of livestock, especially by more careful breeding and by pasture improvement. The high technical levels which can be attained in crop production are exemplified in the Cuban sugar industry, Peruvian cotton, and Colombian coffee, to mention but a few. However, over the region as a whole crop yields are still extremely low, particularly for staple foodstuffs. Much of the agriculture remains traditional in character and there is little use yet of fertilizers, pesticides, and improved seed.

Latin America's fertilizer production is principally for export, even though Chile produces more than 1.6 million tons annually. However, special governmental efforts are being made to encourage the use of fertilizers in those countries with mountainous agricultural regions, where soil erosion has destroyed much of the land's fertility. In Peru the Guano Supply Company has improved methods of collection and raised the

annual supply from 80.000 tons in 1946 to near 100,000 tons in 1947. In Mexico, Venezuela, Colombia, Ecuador, and Chile, government agencies are attempting to educate the farmers in the beneficial use of fertilizers, and at the same time are beginning domestic production of some of the less expensive commercial fertilizers, such as superphosphates.

Imported pesticides, like fertilizers, are very expensive for the Latin-American agriculturists, and scarcely any are produced within the region. Pesticides are used only in the case of specialty crops; for instance, truck crops. In the case of most farming, especially of cereals, insects take a large proportion—from 10 to 20 percent—of the crops, the highest losses being in the tropical areas.

Again, more studies and technical surveys are required to determine what steps need to be taken next Important surveys of this type are the ECLA-FAO Survey of Latin-American farm supplies, transportation, and storage facilities; the UNESCO Hylean Amazon Project, and the FAO Special Mission for Venezuela.

Most governments in Latin-American countries have programs of agricultural development though most of these are general in character. The following paragraphs summarize the information at present available from certain of these countries. Probably the greatest gains in production will be realized in Brazil, Chile, Venezuela, and Mexico.

In 1947 the Government of Mexico adopted a five-year plan that covers the period 1947-52. The principal purpose of this plan is to reduce the deficits of cereals and to produce more vegetable oils. The following measures are planned: increase of areas under cultivation by the irrigation of 850,000 hectares of new land; regular yearly increases of 100,000 hectares in the area of maize and a total five-year increase of 35,000 hectares in sesame; increase in yields by the distribution of better seeds, selection of varieties resistant to pests, and more use of fertilizer. It is estimated that in 1950 production of wheat will increase 50 percent over the 1947 production, maize 10 percent, and sesame 20 percent.

Colombia has set definite goals for its production, especially of those items which are now in part imported:

Wheat—120,000 tons in 1946; goal, 1950—150,000 tons.
Potatoes—460,000 tons in 1946; goal, 1950—640,000 tons.
Sugar—1950 goal, 86,000 tons, or more than twice prewar.

The Colombian government has also set production targets for tobacco, cotton, some oilseeds, cacao, and fruits.

Important gains in food production are expected in Venezuela in the next few years, with most attention going to rice, maize, sugar, peanuts, sesame, and sunflower seed. Unfortunately, agricultural production statistics for this country are not available.

The Peruvian Government is trying to reduce the country's dependence on imports of wheat, fats and oil, and meats, and is trying to increase production of sugar. By 1950, it should have succeeded in reducing imports of wheat, as production is forecast at 60 percent higher than the 1934-38 average, and in 1946 was already 50 percent above this average.

In 1945 a long-term plan for agricultural development was approved by the Chilean Government. Although this plan has not been put into effect, official action tends to follow its several recommendations, which are for orienting the domestic agriculture so as to provide a more adequate diet for the Chilean people. The plan, without quantitative goals, proposes increasing production of wheat, pulses, oilseeds, fruits, vegetables, meat, and dairy products. The area the Chilean Government ex-

pects to be sown in wheat in 1950 is higher than last year's, but since repetition of such high yields is not assured, production may not be so high.

In Uruguay, with the purpose of increasing agricultural production and improving conditions for farm workers, a National Colonization Institute was organized in the early months of the present year. This Institute is an autonomous body with legal authority and sufficient resources for buying, renting, or expropriating land and organizing colonies. The Institute plans to devote greater amounts of land to the cultivation of food commodities, especially cereals, oilseeds, and potatoes.

In Argentina the development programs are mainly concerned with industrial production and with investments in public works projects. They do, however, include some general proposals regarding agriculture, in particular some irrigation projects, and also plans to increase the processing of agricultural products prior to export. The general likelihood is that by 1950 production of maize will probably still be well below prewar, and that of wheat at about the prewar average. The high level of production of edible oils will probably continue, and meat output should increase.

In Brazil, peanut production is expected to be double that of 1947 by 1950. A 10 percent increase in wheat production is planned. Nevertheless, Brazil will still have to import about a million tons (or 70 percent of its total requirements) annually to satisfy the rapidly growing demand for wheat.

By contrast with these expansion programs, the Caribbean area in the next few years will probably have to contemplate a curtailment of its sugar production from its present exceptionally high levels. Cuba will face a difficult problem of readjustment if it has to curtail production by perhaps 15 percent or more, and the same will be true of the other sugar islands. Programs are under discussion for diversifying the character of food production and attempting to become less dependent on food imports.

Indeed, there are two general trends common to all the programs insofar as they are known. The first is to expand agriculture in order to reduce dependence on outside sources of supply; the second is to sell more agricultural products to neighboring South American countries. There is , of course, some conflict between these two objectives unless imports be understood to refer to imports from other continents. During the war and since, substantial shifts in the trade in agricultural products of Latin-American countries have occurred. Before the war 32.8 percent of their food imports came from the United States of America and 41.5 percent from other parts of the Western Hemisphere; by 1947, these figures had changed to 55 percent and 24.8 percent respectively.[3] Latin-American exports of farm products go mainly to Europe and the United States and only 6 percent of them to other countries in the Western Hemisphere. One aspect of the problem of increasing agricultural output is to find markets. It is uncertainty with regard to the import propensity of the United States and the buying power of Europe which impels the Latin-American countries to devote more attention to neighboring markets.

The evidence indicates that under the impetus of national development programs the agricultural production of Latin America should continue expanding at an important rate. But it appears that at least for the next few years, most of the increases in production will be absorbed by the rapidly growing population within the region, with the possible exceptions of meats, oilseeds, and fruits. Further studies and surveys of the region are needed in order to know its true potentialities.

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[3] These calculations refer to all Western Hemisphere countries except the United States of America, i.e., they include Canada and Newfoundland. But this inclusion does not affect the main trend.

Improving Nutrition

The Nutrition Institutes in Latin America are carrying out dietary and clinical surveys on a limited scale, but the Conference of Nutrition Experts convened by FAO at Montevideo in July of this year strongly recommended that more work should be done in this direction. The Conference hoped that research in methods of assessing nutritional status, basal metabolism in various populations, and the compositions of local foodstuffs would be actively developed.

Uneven income distribution aggravates the malnutrition which prevails throughout most of the region. In order to compensate to some extent for the poor diets eaten by sections of the population, many countries are developing school-meal schemes, milk stations, and popular restaurants, which serve good meals at reduced prices. A few countries include free school meals as part of their education service. There is widespread evidence of recognition of the importance of child nutrition. The school garden movement is increasing in popularity.

Nutrition educational developments are particularly interesting in Puerto Rico and Jamaica. In Jamaica an organization originally started with funds from the fruit companies trading on the island has now developed into a powerful educational and welfare organization, subsidized by the Government. Jamaica Welfare (1943) Limited carries out an active "Food for Family Fitness" program. This is a campaign directed towards better nutrition and it correlates agricultural development, land use, home development, child care, health, as well as nutrition teaching. Local leaders are trained to carry out the teaching and to develop the necessary community spirit. Resident district welfare officers guide the leaders. The organization provides literature, films, and other materials, and promotes projects and achievement days. The public response has been favorable and the work is expanding rapidly.

In Puerto Rico the university organized in 1940 a nutrition committee with representation from Government departments, a radio station, the experimental station, the farm security and agricultural extension services, the school of tropical medicine, and the national youth administration. A nutrition campaign was started with a short course for teachers, public health workers, administrators, and other professional people who have direct contact with the population. Nutrition is taught in schools and to parent-teacher associations. Lunchrooms and milk stations have been opened and much is being done co-operatively by the departments and organizations represented on the committee to improve nutrition in Puerto Rico.

In South and Central America nutrition education is not widespread, but it has been found that supervised loan systems for farmers provide a useful starting point for extension, nutrition, and home-economics education among the rural population. Teaching must be practical and must be given to the man in the fields and the woman in the home.

In this area, there are not many national nutrition organizations, although a few countries have very active committees. In most countries, the nutrition work accomplished is the result of the enthusiasm of individual nutritionists working in institutes or universities.

Countries in Central America have collaborated to found an international nutrition institute in Guatemala which will work towards improving the nutritional status of the peoples in that area. Three countries are now full members and three others have stated their intention of giving support to this project. With assistance from the Pan American Sanitary Bureau and some private foundations, students from Cen-

tral American countries are being trained in the United States to take part in the work of the institute.

Forestry and Forest Products

The Forestry and Forest Products Conference[4] organized by FAO in April 1948, at Teresopolis, Brazil, has unquestionably led to a better understanding of the actual forestry situation in the region. The emphasis placed by participating countries on the importance of international co-operation to proper forest management is considered extremely significant.

The Conference brought out the fact that although there are large untouched forest resources in Latin America, there is also very acute need for reforestation in many localities. Populations are concentrated in towns and in somewhat restricted areas of the countryside, and these populated areas have been so heavily overcut that there is a virtual famine of fuelwood and charcoal and, especially in Central America and the Islands of the Caribbean, very severe soil erosion has occurred. The rapid increase of the population adds an additional problem. Shifting cultivation continues to be a principal factor causing deforestation, and in Chile and Argentina forest fires do great damage. If the recommendations of the Conference regarding these and other forestry problems are implemented, they will mark a turning point in the evolution of the forest economy of the continent.

Production

Production in 1946 was estimated to be 179 million $m^3(r)$, or about one-half a cubic meter for every productive hectare in the forests of the region. This represents a very low rate, but the cutting of commercial timber is on a highly selective basis. It is possible that losses from fire, shifting cultivation, and other causes reduce the net growth in the accessible forests to a rate per hectare no greater than the rate of production.

Most of the forests are of the tropical type and include on almost every hectare many different tree species, only a small number of which are marketable. Only 4 percent of the forested area is classed as coniferous, and the scarcity of this sort of wood might be a handicap to the introduction of large-scale industrialization unless suitable substitutes can be found among the profusion of broadleaved species. Introduction of exotic conifers, though very successful in the southern part of the continent, could provide only a partial remedy.

Unquestionably, production could be increased by the opening up and rational development of forests which are now inaccessible, but this process will require a long time. Since the selective exploitation of a few species is very expensive, further commercial enterprise must be based on the exploitation of the majority, or even all, of the species present in the forest. Before this can be done, a great deal of research into the qualities and suitable uses of these species will be needed. Markets must be developed and manufacturing plants installed. Because manpower is scarce and relatively inefficient, both logging and wood transformation must be mechanized as much as possible. Extensive training programs are required and large investments will be needed to build railroads, roads, and possibly wharves and docks. Finally, and per-

[4] See FAO, *Unasylva,* Vol. II, No. 3, Washington, May-June, 1948.

haps most difficult, competent forest services must be organized which will be able to administer these large forest areas and to prevent the devastation which will inevitably follow uncontrolled exploitation.

The number of efficient sawmills and pulp mills in the region is very small, and much of the existing plant is practically obsolete. Lack of means of transportation is one of the most important factors retarding production.

The Teresopolis Conference has recommended that all countries draw up a list of their needs for capital equipment, and that these be integrated in a rational scheme. Some individual countries have already prepared development programs and have requested loans from the International Bank for Reconstruction and Development.

Exports and Imports

Very little positive information is available. The continent as a whole is an importer of wood pulp and paper and even of sawn lumber. Its exports consist mainly of cabinet or other special-purpose woods (balsa, greenheart, quebracho, etc.), but include a small quantity of pine from Brazil. Since the war, an active internal trade in forest products has flowed from Chile and Brazil to Argentina. Brazil could develop its exports considerably if it had sufficient means of transportation and reliable markets. Timber is included in a trade agreement recently signed by Brazil and the United Kingdom.

Consumption

Consumption in 1946 was estimated at 510 kgs. per caput, well below the estimated "normal" figure. It will undoubtedly increase with the future social and economic development of the region. If such development is not accompanied by rational development of the forest, it will give rise to increasing demands on the output of the other forest-producing regions of the world. On the contrary, development of the virgin forests would assist greatly the whole economic development of the countries concerned, open up new possibilities for trade, and at the same time help relieve the world shortage of timber.

Progress

Several governments, having understood the true situation, have drawn up plans for the development of their forests, and implementation is generally entrusted to the "development corporations." The most advanced of these programs is probably that of Chile. Argentina is reorganizing its forest service and revising its forestry legislation. The same is true for Brazil, in which country the National Pine Institute has been placed in charge of all problems relating to the important Paraná pine forests. Reforestation programs are under way in Uruguay, Brazil, and other countries. However, these programs lack the necessary co-ordination with the general development of silviculture in each country.

The Teresopolis Conference took steps to insure the co-ordination of national plans through the establishment of a Latin-American Commission for Forestry and Forest Products. The Conference especially emphasized the idea of development of forest combines, each combine to consist of a group of diverse wood industries fed by a definite area of forests under sustained-yield management, the object being to utilize the whole of the production of these forests.

Progress along the lines indicated above is slow and likely to remain slow because

of the inherent difficulties of developing virgin tropical forests and the shortage of technical staffs. Since forest services are as yet inadequate and there are but few facilities for technical training and research, the setting-up of the necessary institutions must be the first step leading to real progress in the field of forestry.

AFRICA

Africa[5] is a sparsely populated continent and, as far as the natives are concerned, a low-income region. Broadly speaking, there are two kinds of agricultural production: first, cereals and root crops, which are mainly for local consumption and provide the mainstay of the natives' diet; and second, export crops, including oilseeds, sugar, coffee, cocoa, citrus fruits, tobacco, cotton, and sisal. These are second only in importance to minerals among African exports.

During the war demand was strong for many of these agricultural commodities, and also for African minerals. The high level of economic activity intensified the demand for foodstuffs at a time when the difficulties of maintaining imports of flour, rice, canned milk, and other essential foods were increasing. In consequence, special measures had to be taken to increase local production of food, although this was not always an easy matter in face of a severe shortage of incentive goods. The net result, however, was that many African territories emerged after the war with an expanded agricultural production, with new industries and mines, with a general level of income higher than that which prevailed before the war, with an increased retention of food for local consumption, and with a reduced level of agricultural exports.

Despite these changes, African dietary standards remain among the lowest in the world. The main problem is how to get a big increase in food production in order (a) to improve diets and (b) to export in payment for much needed imports of equipment and consumer goods. Aside from the products of mining territories, Africa has very little to export except food. From the standpoint of the highly developed regions Africa appears as a comparatively empty continent with large potentialities of production—a soft currency area with possibilities of much greater exchange of goods with Europe. Indeed, in the last half of the twentieth century Africa may in some cases be to Europe what "the West" was to the United States in the latter half of the nineteenth century. Africa, consisting mainly of colonial territories, is the least well-documented continent; and until more work has been done by governments in ascertaining the facts in each territory, only a very fragmentary idea of the food and agriculture situation is possible.

[5] The discussion in this section excludes Libya, Egypt, Anglo-Egyptian Sudan, Ethiopia, Eritrea, and the Somalilands, which are considered in the Near East, but includes the rest of the continent of Africa and the adjacent islands of Madagascar, Mauritius, and Réunion.

Production

French North Africa

World War II transformed French North Africa from a food-surplus to a food-deficit area. Formerly there was an export surplus of cereals and olive oil; now there is a net import of cereals and vegetable oil. Exports of other foodstuffs have also declined.

Although the population is increasing so rapidly as to create grave supply problems, the area sown to cereals has declined, and as a result of a series of disastrous droughts the output of wheat in 1947 was only two-thirds of prewar. For similar reasons the production of olive oil in Tunisia was much below average. The 1948 output has been excellent.

The citrus industry, on the other hand, has expanded, the number of citrus trees having been more than doubled in Morocco and Tunisia and increased by 70 percent in Algeria. In Tunisia there has been an extension of pear, peach, fig, and quince orchards.

Livestock numbers and livestock production have declined likewise because of the drought. In consequence there are fewer live animals to export to France and less meat and dairy products for the local population.

While it is not surprising to find some decline in the dietary level of North Africa, the particularly low calorie level shown for these territories may be attributed in part at least to incomplete data on the output of cereals, dates, dairy products, vegetables, and certain other foods.

Future programs include large-scale irrigation projects which would more than double the existing irrigated area of about 300,000 hectares. Algeria plans to expand fruit and vegetable production at the expense of cereals because the French demand is unlikely to be strong except for durum types of wheat. Algeria has vast semi-arid tracts which could be utilized as sheep pastures if water-holes were provided, and it is planned to expand the sheep industry with a view to increasing meat supplies and wool production. Morocco plans to recover an export surplus of some 400,000 tons of cereals. Tunisia has irrigation projects and also already has some 13 percent more olive trees than prewar; many of these trees will shortly come into bearing and should contribute to a revival of olive-oil exports.

French West Africa

Rice production for local consumption increased from 400,000 metric tons prewar to 690,000 tons in 1946/47, while the production of millets and maize declined.

Of the export crops the production of oilseeds, in oil equivalent, was in 1946/47 one-third less than prewar, while cocoa production also declined. The decline in production of peanuts, the chief oilseed crop, was in part due to a shift in production from peanuts to other food crops because of insufficient imports of rice and other cereals during and since the war. However, the 1947/48 peanut production shows a marked improvement. Coffee has become an important crop.

There has also been an improvement in the supply position of incentive goods since 1947, though the backlog of demand is still very considerable and current needs for textiles are greater than before the war. As in the case of other French colonies, a smaller proportion of imports is at present coming from France, and imports from elsewhere are dependent on the supply of foreign exchange.

Local processing industries, including oil-expressing and soap-making plants and banana-drying plants, were established in French West Africa during the war partly to save shipping space, while tobacco-growing was extended and a cigarette factory opened.

French Equatorial Africa and the Cameroons

In French Equatorial Africa, during and since the war, the production of cotton, coffee, and rubber has been greatly encouraged by the local administration. Cotton production has more than tripled. On the other hand, palm oil and cocoa production declined for lack of labor and price incentives.

The development plans for French Equatorial Africa include large-scale mechanized production of cotton and peanuts, further development of oil-palm plantations, and a project for large-scale cultivation of rice to provide for the people specializing in the production of export crops.

Liberia

Liberia's agriculture is, generally speaking, of a traditional type. The country has for many years been an importer of foodstuffs and some other agricultural products and an exporter of products such as rubber, cacao, coffee, palm kernels, and piassava fiber.

Of the crops grown for local consumption, upland rice is the most important. However, the country has not produced sufficient rice for home consumption. Rice imports in 1944 amounted to about 3,000 metric tons as compared with an average prewar importation of about 2,000 tons.

Meat and dairy products, too, are on an import basis, as cattle are not generally used for meat except on ceremonial occasions, and milk is not utilized by the indigenous population.

As in most other parts of West Africa, the native diet consists largely of starchy foods such as rice, cassava, eddoes, and yams, and of fats from palm oils. The source of proteins is domestic animals, game, fish, and birds. But the diet appears to be deficient in proteins, and possibly in certain vitamins.

Very little statistical information is available about agricultural production in and exports from Liberia. It is known, however, that the Liberian Government plans to extend the area of such export crops as cocoa, coffee, and oilseeds, as well as the area under rice, sugar cane, and cotton. It also aims at combatting the tsetse fly and introducing better quality draft animals.

British West Africa

In British West Africa, including Nigeria, the Gold Coast, Gambia, Sierra Leone, and the British Cameroons, cereal crops predominate in regions with a dry season, and root crops in areas with no such distinction of seasons. As in French West Africa, a large variety of food crops is grown for home consumption, including yams, cassava, maize, rice, guinea corn, millet, various species of legumes (cowpeas, pigeon peas, lima beans); peanuts; fruit, especially oranges, bananas, and plantains; and palm oil. Unfortunately, production data are not available for these food crops.

The export crops are principally oilseeds and cocoa. The output of oilseeds, which are grown mainly in Nigeria, declined during the war, and has not yet fully recovered, largely for lack of incentive goods. Cocoa production and exports are reduced, partly on account of price policy, and more recently on account of the spread of swollen-shoot disease. This disease has become a serious threat to the Gold Coast cocoa industry and every owner or occupier of a cocoa farm is now required to stump out all the infected trees.

In British West Africa the most urgent need in the immediate future is for more cereals, especially rice. Because of the world rice shortage, plans have been formulated

to increase production in the mangrove swamps of the Niger, where over 60,000 hectares could be brought under cultivation, given proper drainage and water control, and also in the Volta River basin in the Gold Coast, in the coastal areas of Sierra Leone, and along the Gambia River. An attempt to meet the large demand for rice might release additional quantities of other foodstuffs for export.

The possibilities of large-scale cultivation of oilseeds are smaller in West than in East Africa, according to the *Report of the West African Oilseeds Commission.*[6] The Commission estimated that their proposals would involve a total capital expenditure of about £25,000,000, and would result ultimately in an annual production of not less than 229,000 metric tons of shelled peanuts (91,000 metric tons, oil equivalent).

There is scope also for the development of the palm-oil and palm-kernel industry in the Cameroons, Nigeria, and Sierra Leone. Considerable areas of palm trees could be used for production, provided the necessary machinery and labor were made available. One problem is to improve the cracking machinery and the methods of extracting the oil from the palm kernels. Production of benniseed (sesame) could be expanded if there were sufficient price incentive.

A textile development program has been included in the 10-year development and welfare plan for Nigeria. The plan also provides for the establishment of palm-oil mills, of which one was opened in 1946, the second being under construction. In the Gold Coast a cocoa-butter factory has been erected. In this colony and in Nigeria, departments of commerce and industry have been established.

Belgian Congo and Portuguese Territories

The principal food crops grown in the Belgian Congo are manioc, maize, millets, rice, peanuts, bananas, and palm oil. To a considerable degree the extent of food production has been determined by the needs of the mining areas, and under the compulsory production scheme the area devoted to native food crops almost tripled during the war, thus providing for the increased demand for food of the rapidly growing nonagricultural population. Production statistics have not been available until the 1948 Annual Report to FAO.

The principal export crops are palm oil and palm kernels, cotton, hard fibers, rubber, and coffee. Of late, forest products are also gaining in importance as articles of export. The area under palm plantations increased from about 98,000 hectares in 1939 to 167,000 hectares in 1946.

The two main areas of cotton are along the northern frontier and along the rivers Sankuru and Kasai on the western border of the Lusambe Province. Native production and marketing are actively stimulated. Cotton cultivation before the war already occupied over 300,000 hectares, and a sharp increase in production has taken place since that time. Local mill consumption is estimated at about 3,000 metric tons, and the contemplated expansion in cotton-manufacturing capacity may raise consumption to 5,000-6,000 tons annually.

Other new processing industries include palm-oil extraction and refining and soap manufacturing.

For the Portuguese territories in Africa no information on production is available.

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[6] *Report of the West African Oilseeds Commission,* London: H. M. Stationery Office, 1948, Colonial 244.

British East Africa

Little information is available concerning the staple crops, which are principally maize in Uganda and Tanganyika and a wide variety of cereals in Kenya. It is believed, however, that production expanded during the war. Uganda, formerly a cereal importer, is now self-sufficient, but Tanganyika still imports from the Congo and from South Africa.

Among the export crops, sisal is important in the foreign trade of Kenya and Tanganyika, as also is cotton, but cotton exports are below prewar, and much remains to be done in improving the methods of cultivation. Coffee production and exports show some slight increase, both of the *arabica* varieties grown by Europeans, and the *robusta* grown by natives. Pyrethrum was in high demand during the war, when other sources of supply were cut off. Exports are now declining. Other export crops include tea, citrus fruits, tobacco, essential oils, and spices.

Food-processing industries are being established in these territories; e.g., in Uganda rice mills have been installed, a soybean factory has been set up, and a large factory for extracting and refining vegetable oils will be completed in 1949. In Kenya, such industries as coffee curing, tea processing, wheat and maize milling, brewing, bacon and ham curing, and meat canning are well established. One of the largest deposits of phosphates yet known has been discovered in eastern Uganda, and this when developed may contribute to raising the soil productivity not only of Uganda, but also of neighboring territories.

A most significant event for East Africa has been the peanut development program, which mainly affects Tanganyika, but to a lesser extent also Kenya and Northern Rhodesia. The details of the plan have been described elsewhere.[7] Briefly, what is proposed is to bring into cultivation within the next few years 1.3 million hectares of land in hitherto almost uninhabited districts. This is anticipated to yield over 600,000 metric tons of peanuts by 1951. The economic benefits of the plan for the region will extend far beyond the immediate program. The eradication of the tsetse fly, the provision of water supplies, the new railroads, and other improved communications to serve the peanut plantations will facilitate the opening up of several large areas which are at present undeveloped. Apart altogether from the peanut scheme, Tanganyika has a 10-year development program, covering a wide field and including the development of native agriculture, soil conservation, extension of the fishing industry, and controlled resettlement from overpopulated districts.

Nyasaland and Northern and Southern Rhodesia

As in several African territories, not enough information is available to give any account of the output of staple food crops. In good years these three territories are self-supporting as regards cereals; in bad years they import from adjacent areas. Since 1940 Nyasaland has become almost self-supporting in wheat, and rice production has nearly trebled. Northern Rhodesia plans to extend the cultivation of maize in connection with the Sabi River irrigation scheme. Southern Rhodesia will also expand maize and wheat production through its scheme for the resettlement of ex-servicemen. Export crops are of some importance, although copper, coal, chrome, and asbestos are the chief exports from Northern and Southern Rhodesia. All export is hampered by the long and costly haul to coastal ports. Tobacco production is expanding. Nyasaland's tobacco exports are double prewar, and there has been a large expansion in Southern Rhodesia, where one-half of the total labor force is said to be engaged in the tobacco industry. Other export

[7] FAO, *Economic Review of Food and Agriculture,* Vol. 1, No. 2, Washington, U.S.A.

crops include tung oil, peanuts, soybeans, cotton, and hides and skins. The main obstacles to further expansion of all these products are labor shortage and the tsetse fly.

Union of South Africa

Since 1946/47 the food position of the Union has generally improved and in 1947/48 it was more favorable than at any time since 1942.

The domestic demand for cereals has risen so rapidly in recent years that South Africa has ceased to be an exporter of maize and has even become, in some years, a net importer of cereals. The Government has encouraged an expansion of cereal production by fixing prices at attractive levels, and wheat and maize cultivation has been extended into marginal areas, while the other areas have been more intensively cultivated. In spite of this, because of a succession of adverse seasons and a lack of fertilizers, the output was disappointing until 1947/48, when an excellent maize crop was harvested. Any surplus from this crop, however, will probably be used for stock-piling rather than for export. South Africa, in order to conserve wheat, still retains a flour extraction rate of 96 percent and other restrictions on the sale and use of flour and meal.

Sugar consumption has increased from an average of 272,000 metric tons prewar to over 420,000 tons in the last two years. The export surplus has disappeared, and in several seasons the output has been barely sufficient for the domestic market. A five-year expansion program has been initiated, with the object of increasing production by 40 percent above present levels, to total some 650,000 tons in 1950/51. The program envisages a further expansion in the 1950's by the development of new production under irrigation in the Makatim Flats.

Oilseed production increased from about 4,000 metric tons, oil equivalent, prewar to 32,000 tons in 1947/48, consisting principally of peanuts and sunflower seed.

There were practically no new citrus plantings during the last decade because of depressed prices in the 1930's and export difficulties during the war. Since 1945 the position of the industry has improved again, in spite of inadequate supplies of nitrogenous fertilizers. It is doubtful whether this improvement will lead to large-scale new plantings, as the belief prevails that opportunities for further expansion are rather restricted.

The South African livestock industry has been adversely affected by a succession of droughts. Grazing was much better in 1947/48, and supplies of meat and dairy products have improved. There has been some shift in milk utilization from butter and cheese production to the consumption of whole milk in liquid form. Livestock numbers are expected to increase in the near future.

The supply position of farm machinery and equipment is still difficult; in particular there is a shortage of heavy tractors. Moreover, the high level of industrial activity has aggravated the farm-labor shortage. The scarcity of nitrogenous fertilizers is reported to be affecting the yields of fruit, sugar, corn, vegetables, and wheat. Superphosphates have been scarce, but a new factory is being established which should help to remedy the situation.

The efforts to increase food production during the war served to underline a perennial problem in South Africa, namely, soil erosion. It is estimated that some 120,000 hectares of topsoil are lost each year. Following the establishment in 1945 of a Department of Soil Conservation and Extension, and the Soil Conservation Act of 1946, some 165 soil-conservation districts have been mapped out, covering a total area of 167 million hectares, or approximately one-seventh of the area of the Union. Should agricultural prices decline, there is every likelihood that marginal areas will go out of food production, conservation

measures be taken more seriously, and food output temporarily curtailed in preparation for much greater production possibilities later on.

Madagascar, Mauritius, and Réunion

Rice is the staple diet of Madagascar together with manioc, sweet potatoes, and maize. Pulses of several varieties are grown and are important sources of vegetable protein especially in the poorer areas where rice is less abundant. Rice, the staple food of the inhabitants, is now in short supply, necessitating government control, and an import of about 20,000 metric tons is considered necessary to maintain the prewar level of consumption.

Coffee is the principal cash crop in Madagascar, most of which is exported to France. The *arabica* variety has recently gained in importance. Certain quantities of maize, manioc, rice, pulses, sugar, and meat were also exported before the war, but because of an increase in local consumption these exports have declined.

In common with other French colonial possessions, Madagascar is to benefit from the scheme for colonial development. The program aims to increase agricultural production by extension of area under crops and increased yield per hectare; to improve transport facilities, thus facilitating a better flow of goods within the country and permitting increased regional specialization; and to develop animal husbandry.

The economy of Mauritius is based almost wholly on the growing of sugar cane and the manufacture of sugar, of which around 300,000 metric tons is produced each year, mostly by large planters. Though the colony is essentially agricultural, it produces barely one-tenth of the foodstuffs required by the population. Before the war, about 60,000 metric tons of rice were imported annually from India and Burma. Owing to the rice shortage in Far Eastern countries in recent years, Mauritius has had to import flour from Australia in increasing quantities. During the war some cane area was turned over to other foodstuffs, but this has now been put back to sugar. A good deal of land is not under any form of cultivation and surveys are necessary to determine how much could be made productive. Under a 10-year development plan, extension of the cultivated land by irrigation has been provided for, as has a campaign to increase and improve the island's milk supply. The main economic problem of Mauritius is the diversification of agriculture by development of the tea and livestock industries and the creation of a class of peasant proprietors and small holders engaged in growing food.

For Réunion no information is available to FAO except that the sugar industry upon which the island depends is recovering steadily toward its prewar level of output.

TABLE 29.—LIVESTOCK NUMBERS IN AFRICA, PREWAR, 1946/47, AND 1947/48 [1]

Area [2]	Cattle		Sheep and Goats		Horses, Asses, Mules, and Camels	
	Prewar	1946/47	Prewar	1946/47	Prewar	1946/47
	(*Thousand head*)					
North Africa	4,570	3,695	77,220	28,400	3,110	2,695
East Africa	13,095	13,390	15,650	15,975	490	537
West Africa	14,245	17,080	28,915	37,590	2,070	2,200
South and Central Africa	23,350	26,890	55,250	45,925	2,165	1,904
TOTAL	55,260	61,055	177,035	127,890	7,835	7,336

[1] Includes census figures, where available, and official and unofficial estimates.
[2] See footnotes for Table 31.

Foreign Trade

Certain information about exports and imports of food in African territories has been given in the preceding section, and here only the more outstanding features for the continent as a whole will be noted.

Africa has shifted from being a net exporter to being an importer of cereals. Prewar net exports were 890,000 metric tons; 1946 net imports were 1,297,000 tons. This means a loss of one and three-quarter million tons in the world market. The regions primarily responsible are French North Africa, which has shifted from a next exporter to a net importer position, and the Union of South Africa, which has shifted from a net exporter position to one of more or less self-sufficiency. The change would have been more marked if West Africa had not been obliged to do without rice, which it normally imports on a large scale. There is some intra-African trade in cereals in cases where one territory suffers a crop failure and is assisted by a neighboring territory where crops have been good.

African exports of fats and oils are substantially less than before the war. West African exports declined from 720,000 metric tons in oil equivalent prewar to 520,000 tons in 1946. This was caused partly by increased local consumption and partly by a decline in production. French North Africa, which before the war approximately balanced its olive-oil exports against equivalent imports of other oils, was a net importer in 1946 by 38,000 metric tons. The general outlook is, however, for a recovery of oilseeds exports from Africa during the next two years. After that time, the new peanut development programs should begin to show results.

Sugar exports from Mauritius are recovering to the prewar level, and exports from Réunion are expanding above that level. South Africa, which used to be the largest exporter, has ceased to export because of a rise of some 60 percent in domestic consumption during the past ten years. However, its plans for expansion of sugar production should put it back into export business, but perhaps on a smaller scale than formerly.

Coffee exports have almost doubled compared with prewar, increases being especially large from French West Africa and Angola. The volume of cocoa exports shows no great change, but plant disease may cause a fall in exports in the near future.

Citrus-growing has expanded so much in French North Africa that exports are expected to expand substantially in the near future, whereas no increase is foreshadowed in South Africa.

TABLE 30.—PRODUCTION AND TRADE OF CEREALS IN AFRICA, PREWAR, 1946/47, AND 1947/48

Country	Production [1]			Area [2]	Net Trade (Export− Import +)	
	Prewar	1946/47	1947/48		Prewar	1946
	(*Thousand metric tons*)					
Algeria	1,819	1,442	944	North Africa (French)	−457	+683
Morocco	2,070	1,910	2,051	East Africa	−13	+12
Tunisia	579	501	...	West Africa	+128	+30
French Cameroun	500	465	...	South and Central Africa	−548	+572
French West Africa	3,025	2,100	...			
Union of South Africa	2,744	3,010	3,482			
Madagascar	794	769	803			
TOTAL	11,531	10,197	...	TOTAL	−890	+1,297

[1] Production in selected areas; adequate sources not available for the rest of Africa.
[2] See footnotes for Table 31.

TABLE 31.—PRODUCTION AND TRADE OF SELECTED COMMODITIES IN AFRICA, PREWAR, 1946/47, AND 1947/48

Commodity and Country	Production			Net Trade (Export− Import +)	
	Prewar	1946/47	1947/48	Prewar	1946
	(.....*Thousand metric tons*.....)				
Sugar (raw equivalent)					
North Africa[1]	...	...	...	+294	+182
East Africa [2]	48	*60	*84	−13	−8
West Africa [3]	16	15	*16	+26	+5
South and Central Africa [4]	917	920	1,036	−635	−503
TOTAL	981	995	1,136	−328	−324
Cotton (ginned)					
East Africa	72	49	*39	−68	−49
Belgian Congo	31	40	*40	−29	−46
Mozambique	6	*20	*21	−5	−32
All others	27	37	...	−24	−40
TOTAL	136	146	...	−126	−167
Tobacco (dry leaves)					
North Africa	20	*17	...	−5	...
East Africa	1	1	...	—	...
West Africa	4	3	...	+4	...
South and Central Africa	36	61	...	−17	−26
TOTAL	61	82	...	−18	...
Coffee					
North Africa	—	—	—	+20	+19
East Africa	44	47	63	−41	−50
Belgian Congo	18	29	22	−15	−20
French West Africa	8	37	36	−8	−36
Other West Africa	6	19	16	−5	−10
Angola	17	53	*53	−16	−47
Madagascar	24	30	28	−27	−22
All others	—	—	—	+16	+25
TOTAL	117	215	218	−76	−141
Cocoa					
West Africa (French)	81	74	*74	−81	−77
West Africa (British)	377	*306	*306	−357	−354
All others	14	16	...	−12	−12
TOTAL	472	396	...	−450	−443
Citrus fruit					
North Africa	136	210	*220	−56	−58
South and Central Africa	187	175	204	−105	−98
TOTAL	323	355	424	−161	−156
Fats and oils (oil equivalent)					
North Africa (French)	...	...	...	−3	+38
East Africa	...	...	...	−36	−7
West Africa (British)	...	...	...	−455	−390
West and Equatorial Africa (French)	...	...	...	−265	−130
Portuguese Territories	...	...	...	−44	−67
Belgian Congo	...	...	...	−98	−123
Others	...	...	...	+36	+24
TOTAL	...	...	...	−865	−655

* Indicates unofficial estimate.

[1] Unless otherwise specified, the term North Africa includes Algeria, French Morocco, Spanish Morocco, and Tunisia. [2] East Africa includes Kenya, Tanganyika, Uganda, Zanzibar, and Pemba.

[3] West Africa includes Belgian Congo, British Cameroons, French Cameroun, French Equatorial Africa, French West Africa, Gambia, Gold Coast, Liberia, Nigeria, Ruanda Urundi, Sierra Leone, British Togoland, and French Togoland.

[4] South and Central Africa includes Angola, Basutoland, Bechuanaland, Madagascar and dependencies, Mauritius and dependencies, Mozambique, Nyasaland, Réunion, Northern Rhodesia, Southern Rhodesia, Southwest Africa, Swaziland, and Union of South Africa.

Cotton exports have increased by some 30 percent, especially from Mozambique, Belgian Congo, and French Equatorial Africa, and there are plans for further expansion.

Data for tobacco are incomplete, but exports appear to have increased by at least 70 percent, primarily from Northern and Southern Rhodesia.

The general pattern of the changes in Africa's trade in agricultural products consists in a remarkable expansion of the export of minor and specialty crops, contrasted with a much reduced export of the major products, namely, cereals, fats, and sugar. The people of Africa are without a doubt retaining more food for their own consumption, but it is equally certain that production can be expanded much further for still better diets and for export. In the years immediately ahead, Africa may be expected to increase its contribution to the world supplies of all the commodities mentioned except cereals, of which its imports may even increase.

Consumption and Nutrition

As far as can be ascertained from fragmentary and unreliable statistics, the food supplies available for consumption per person of population in the different parts of Africa appear to have remained at approximately the same level in 1947/48 as in

TABLE 32.—PER CAPUT SUPPLIES OF MAJOR FOODSTUFFS IN CERTAIN AFRICAN COUNTRIES, PREWAR, 1946/47, AND 1947/48

Country and Period	Cereals[1]	Roots, Tubers, and Starches	Sugar	Pulses and Nuts	Fruits and Vegetables	Fats and Oils	Meat	Milk and Cheese	Eggs	Fish
	(*Kilograms per caput per year*)									
French Morocco										
1934–38	107.1	3.3	24.8	1.1	37.2	6.3	28.5	199.1	4.3	3.0
1946/47	104.0	2.7	9.2	5.9	31.4	4.4	14.5	107.1	3.2	5.2
1947/48	109.2	1.4	11.5	1.8	30.5	4.8	15.2	115.3	3.1	4.1
Algeria										
1934–38	106.1	7.7	10.4	3.3	51.3	7.0	13.4	99.7	2.2	2.5
1946/47	106.6	6.2	9.3	2.8	43.4	4.1	8.0	65.6	2.1	2.6
1947/48	82.8	7.1	9.3	2.6	46.2	5.9	8.9	71.0	2.1	2.8
Tunisia										
1934–38	86.0	8.8	12.7	5.8	33.8	7.0	17.7	97.0	3.5	4.2
1946/47	96.3	7.5	11.9	5.9	26.7	7.8	13.4	70.9	2.8	1.6
Kenya and Uganda										
1934–38	58.2	491.4	5.1	24.8	25.0	4.1	22.4	32.1	...	1.1
Tanganyika										
1946/47	90.5	328.5	2.5	21.2	7.4	1.8	20.4	27.0	...	1.1
Madagascar										
1935–39	136.4	259.1	1.1	5.8	26.3	2.4	28.8	92.3	2.1	5.0
1946	115.4	216.7	4.4	5.7	26.1	2.1	31.1	88.5	1.6	4.5
1947	121.8	154.9	2.8	2.5	25.8	1.9	29.1	87.7	1.8	4.5
Union of South Africa										
1935–39	146.3	16.3	23.6	3.9	63.7	4.1	58.8	79.5	2.9	2.5
1946	152.9	20.7	33.4	4.1	69.3	4.2	49.9	79.8	5.3	3.0
1947	170.0	23.6	33.4	4.7	67.4	4.7	51.2	79.9	5.2	2.6

[1] Milled basis.

1946/47. In South Africa there has in general been an improvement, and it is expected that this will be maintained in 1948/49. In some parts, particularly in North Africa, food consumption levels have not yet returned to the prewar levels. (See Table 32.)

Average figures for Africa are more than usually nonrepresentative of any group of the population because of the diversity of tribes with different dietary customs and traditions.

In most parts of Africa over 50 percent of the calories available are derived from cereals and starchy roots and tubers, and it is estimated that the proportion is as high as 80 percent among some population groups. (See Table 33.)

Investigations into the nutritional status of the native populations in Africa have frequently revealed dietary deficiency diseases. Too little of this work has been done to give any representative picture. However, nutritional surveys are being undertaken in the Belgian Congo, British West Africa, British East Africa, and French Equatorial Africa. When these investigations are completed, the relation of the health of the people to the diet will be more fully established.

Dietary surveys have been made in recent years in Mauritius, Northern Rhodesia, and other areas, but the results have given only a very limited picture of food consumption. A nutrition field-working party in Gambia is at present carrying out a comprehensive study, including an investigation of dietary deficiencies and the physiological aspects (including energy exchange) of various types of agricultural work done

TABLE 33.—NUTRITIVE VALUE OF FOOD SUPPLIES IN CERTAIN AFRICAN COUNTRIES, PREWAR, 1946/47, AND 1947/48

Country and Period	Calories		Protein			Fat
	Daily Supply per Caput	Percentage from Cereals and Starches	Daily Supply per Caput		Animal Protein Related to Total Protein	Daily Supply per Caput
			Total	Animal		
	(*Number*)	(*Percentage*)	(.....*Grams*.....)		(*Percentage*)	(*Grams*)
French Morocco						
1934–38	2,044	49.32	68.6	34.4	50.14	54.4
1946/47	1,604	61.16	55.8	19.1	34.23	34.2
1947/48	1,644	61.50	55.2	19.9	36.05	37.4
Algeria						
1934–38	1,802	56.77	61.9	19.3	31.18	44.2
1946/47	1,548	65.63	48.3	11.9	24.80	29.0
1947/48	1,360	57.73	42.4	12.8	30.19	38.9
Tunisia						
1934–38	1,619	53.18	63.6	33.0	51.90	59.8
1946/47	1,563	59.18	53.0	17.2	32.45	45.3
Kenya and Uganda						
1934–38	2,328	74.78	57.7	14.5	25.13	34.9
Tanganyika						
1946/47	2,118	79.89	58.2	8.7	14.09	27.9
Madagascar						
1935–39	2,591	80.51	65.7	24.7	37.60	37.3
1946	2,249	72.27	61.5	25.6	41.63	33.7
1947	2,074	73.29	57.3	24.6	42.93	31.6
Union of South Africa						
1935–39	2,354	62.49	75.4	33.4	44.30	49.9
1946	2,459	61.33	78.5	30.9	39.36	51.6
1947	2,651	63.41	83.5	31.1	37.25	55.8

by Africans. This survey will be the basis for an experimental study on methods of improving the standard of nutrition and living conditions. Research in Basutoland is concerned with pellagra and its relationship to change in maize-milling techniques, and with techniques of parboiling rice and the factors which affect the movement of vitamin B (thiamine) in the rice grain.

Interesting developments in nutrition education and in education projects where nutrition might suitably be included are reported from Africa. In addition to the Gambia experiment, mass education is advancing in many places, sometimes taking the form of communal development in rural areas. That these village improvement and education plans can well include nutrition was demonstrated in Antigua, where the combined village council of three neighboring villages arranged lectures on subjects, including infant care and balanced diets. This method of starting education at small focal points and allowing it to spread is a more practical approach to nutrition improvement in a relatively backward country than elaborate comprehensive planning. That information and interest spread from village to village has been shown in the mass education campaign in the Udi district of Nigeria.

National nutrition organizations have been formed in many of the countries and territories of this area. South Africa has an especially active council, formed in 1940, which acts in collaboration with the National FAO Committee.

Increasing Supplies

The production programs of individual territories have already been noted, but certain over-all problems are common to the entire continent of Africa. This interrelationship has been recognized by the establishment of Anglo-French-Belgian-Portuguese consultative machinery for colonial development questions, and as a first result a soil conservation conference is to be held in November 1948 in Ruanda-Urandi, to define the direction of future soil-conservation activity in colonial territories and to effect co-ordination of programs.

Closely connected with soil-conservation policy is that of reforestation, already under active examination in certain territories. Another difficulty in increasing production is the insufficient water supply over large areas. Although certain irrigation projects are in hand, much more remains to be done. Moreover, smaller works such as bore-holes, wells, and small rainfall storage tanks are hardly less important.

Perhaps health is the most fundamental problem which must be solved before Africa can develop very far. At present the greater part of the continent is unfit for habitation by men or domestic animals. The recently devised control methods make it possible for the first time to contemplate the eradication of malaria, yellow fever, sleeping sickness, plague, and leprosy on large parts of the continent. Until this is done, large areas which are capable of growing crops cannot be brought into use. At the same time attention must be given to the serious conditions of undernutrition and malnutrition which lower the resistance of Africans to disease.

Another limiting factor to development is the poverty of communications, lack of railroads, motor roads, and harbor installations. Another is the social structure of African society. The individual cultivation of holdings of land which is communally owned, for example, is not conducive to the maintenance of soil fertility. Neither is the shifting cultivation by nomads and pastoral tribes; over the centuries this has been responsible for much deforestation and soil erosion. Further, the custom of regarding

cattle as a form of currency, to be used in barter or as marriage payments, has resulted in large herds of unproductive animals, leading to overstocking and in turn to soil erosion. A general improvement in the quality of herds belonging to Africans is therefore bound up with a change in the social outlook of the people.

It must be concluded that large possibilities exist for the expansion of agriculture in Africa, but that most programs will involve very heavy investment and a substantial parallel effort in the field of health and other social services. Some detailed evidence on these matters has been provided by the commissions which have recently surveyed particular areas, but much more remains to be gathered. The next step is to develop further the intergovernmental consultations on African problems and to define ways and means of advantageously co-operating on practical projects at a technical level.

Forestry and Forest Products

The forestry situation in Africa has been the subject of much misunderstanding. It has commonly been thought that the forest resources of the continent were so vast in extent that they constituted a reserve which could, in future, contribute very large quantities of timber to other regions of the world. Although the total forest area is large, two-thirds of that area is of such poor quality that it must now be classed as "unproductive." Most of this permanently degraded forest has reached its present state through the practice of shifting cultivation, including extensive and repeated burning in the interest of agriculture and grazing. In this way, immense areas of formerly productive forests have been reduced to useless scrub.

On a continental basis, the average inhabitant of Africa has only 2 hectares of productive forest at his disposal. The distribution, however, is uneven and in many individual territories the shortage of forest products is acute. On the other hand, there are regions such as the Belgian Congo and some territories on the west coast which still possess large forests of great extent which, if they are rationally developed and managed, can make great contributions to an expanding economy and improved standards of living for the populace. As in other tropical forests, one of the chief difficulties impeding such development is the extreme complexity of the forest stands and the fact that only a relatively small number of the many species present have, as yet, been accepted on world markets.

In the tropical and semi-tropical forests of the non-selfgoverning territories, a great deal of constructive planning and development has been carried on by the responsible metropolitan powers, often under conditions of great difficulty. Since the war interesting developments in international co-operation in this field have taken place through the Anglo-Franco-Belgian-Portuguese technical consultations.

Production

The forests of Africa are mainly composed of broadleaved species, and less than 1 percent of the productive area is occupied by conifers. In 1946 the total production of wood was estimated at the low figure of 47 million $m^3(r)$. It is more than probable, however, that large quantities consumed by native populations have not been included in the statistics on which this estimate was based.

Commercial exploitation, confined as it has been to a few selected species, has been very costly. Since rational development of the tropical forests requires more complete use of the species present, it is most important that possible uses of woods till now

considered valueless should be investigated and that markets for them should be developed.

Forest operations also suffer from insufficiency and inefficiency of manpower. Consequently, increased mechanization and the training of forest labor appear to be prerequisites to progress.

Other requisites to further development are the construction of roads and railroads and better port facilities, and the building up of forest administrative organizations sufficient in numbers and technical skill to insure that the forests may be used without being destroyed.

Facilities for the extraction and manufacture of forest products are relatively small and, for the most part, of low efficiency. Plans are now being developed in the French, British, and Belgian territories for expansion of industries, including the installation of new sawmills, and of plywood, fiberboard, and wood chemical plants, with corresponding programs for improvement of public works and transportation systems.

Exports and Imports

The African countries which submitted official reports to FAO in 1946 reported imports of forest products equivalent to 2 million $m^3(r)$. The Union of South Africa and Southern Rhodesia were the chief importers with a total of 930,000 $m^3(r)$. North Africa imported 800,000 $m^3(r)$. Exports for the same group of countries were equivalent to 700,000 $m^3(r)$ and included 340,000 $m^3(r)$ of sawlogs. The volume of production of sawn lumber amounted to 330,000 $m^3(s)$, of which 70,000 $m^3(s)$ were exported.

In 1937 the French territories alone exported 582,000 $m^3(r)$ of wood. Present development plans provide for exports in 1950 of from 700,000 to 800,000 $m^3(r)$, these quantities to include relatively large proportions of saw logs. However, the possibility of considerable delay in the execution of these plans is already foreseen.

Consumption

Consumption of wood for all purposes is estimated to be about 380 kilograms per caput, a figure considerably below what is necessary for a satisfactory standard of living. Given proper management, existing forests in many of the territories are sufficient to yield far more adequate supplies of wood to the people. Some of the drier regions, however, appear to be condemned to perpetual shortages of forest products.

National Programs

Forest research work is being carried out in various regions of tropical Africa. France has reorganized its forestry service, and forest inventories and the establishment of forest reserves are under way. The forests of the British territories are being reexamined by means of aerial surveys. Particular interest attaches to the large afforestation program which is actively under way in South Africa, and which is expected to make that country almost self-sufficient as far as coniferous woods are concerned within half a century. In the past year 6,280 hectares were planted, of which 2,500 hectares were new afforestation and the balance represented re-establishment of stands on clear-cut areas. Production from softwood plantations during the year totaled 60,000 $m^3(r)$.

UNION OF SOVIET SOCIALIST REPUBLICS

Postwar Recovery in Soviet Agriculture

Despite severe wartime destruction, a considerable recovery in Soviet agriculture was already under way during 1945.[8] This recovery, however, was seriously interrupted in 1946 by a drought on a scale unequalled in the Union of Soviet Socialist Republics during the past half century. Grain crops, sugar beets, and sunflower-seed production in the Soviet Union as a whole declined sharply in 1946 as compared with 1945. In those regions that escaped the drought, i.e., western Siberia and Kazakstan, however, crop production in 1946 was reported to have increased by 50 percent over the 1945 level.

The effect of the drought on the food supply situation was seen in the decision to extend bread rationing into 1947 (it was originally intended to abolish bread rationing in 1946), and to cut bread rations for some categories of consumers. A more serious consequence of the drought, however, was the much lower production of sugar beets, sunflower seeds, and fodder crops, which aggravated the already existing shortages of sugar, fats and oils, and livestock products.

The serious deficiency in crop production called for radical measures to improve the situation, and in February 1947 a program for the postwar development of Soviet agriculture was mapped out.

The 1947 Harvest Results

With extremely favorable weather, the harvest of 1947 was much improved, as will be seen from the following figures:[9]

U.S.S.R.: Indices of Production of Major Agricultural Commodities in 1947 (1946 = 100)

Grain crops	158
Cotton	121
Potatoes	130
Sugar beets	290
Sunflower seeds	179
Flax fiber	129
Hemp fiber	178

Cereal yields per hectare in 1947 were back to the prewar level and state grain collections were also equal to prewar volume although the total area sown and the supply of tractors and other agricultural machinery were still much below prewar. The considerable expansion of sown areas in the eastern regions of the U. S. S. R. during the war

[8] By the first half of 1945 sown areas in the formerly occupied regions had reached around 66 percent of prewar, while 86 percent of the ruined collective farms, and all state farms and machine tractor stations in these areas, were in operation, though at levels below prewar capacity. In addition, some 26,000 tractors, over 40,000 agricultural machines of other types, and nearly 3 million head of cattle had been replaced. (The occupied areas had lost three-quarters of their tractors and more than half their horses.)

[9] Compiled from official Soviet figures quoted in *U.N. Monthly Bulletin of Statistics, February 1948.*

years has been maintained and extended, so that the area east of the Urals is now an important source of food supplies. The increase of over 4 million hectares per year in the arable area in the eastern regions during the war years 1942-44 was greater than the annual prewar increase in sown area for the country as a whole. No less significant was the introduction of a frost-resisting type of wheat into Siberia and the extension of sugar-beet cultivation to 12 new regions, among which were Uzbekistan, Kazakstan, and the Kirgiz.

Total agricultural output in 1947 was reported at 32 percent above 1946, including a 48 percent increase in crop production. Compared with 1946, 3.5 million additional hectares were put under winter sowing in 1947 for the 1948 harvest and 8 million additional hectares were ploughed in the autumn for spring sowings in 1948. The volume of work done by tractors was 29 percent greater in 1947 than in 1946, with a reported increase of 21 percent in output per tractor.

Thus the greatly improved situation in 1947 made possible the removal of bread rationing (in December 1947) and effected an over-all improvement in food supplies. In addition, substantial quantities of grain were made available for export—more than in any year since 1931/32.

Food supplies (national average) in 1947/48 were probably not too far below the prewar intake of 2,800 calories per person per day; but the average diet, as was the case in prewar years, consisted mainly of cereals, roots, and tubers.

1948 Production and Consumption Prospects

Assuming normal weather conditions during the remainder of the current agricultural year, the prospects for a further and substantial recovery in Soviet agriculture during 1948 are bright. Despite an early June drought in the Volga area the crop outlook is favorable in the important wheat regions of the Ukraine and Northern Caucasus, from which Soviet grain exports mainly derive. Crop conditions in Siberia are also good. Yields per hectare are back to prewar, and special efforts are being undertaken by the Government to get farmers to raise 1948 and 1949 grain yields to well above prewar. A recent directive (June 1948) which sets new and higher harvest indices for these years asks farmers for wheat and rye yields of 3.2 metric tons per hectare in districts with adequate rainfall (i.e., the Ukraine and Northern Caucasus) and 2.5 tons per hectare in the southeastern districts of the country where climatic and soil conditions are less favorable.

Favorable factors in the present situation include more adequate supplies of tractors and other agricultural machinery, increased fertilizer and fuel supplies, and increased productivity of collective farmers and tractor drivers due to changes in methods of remuneration. Higher yields per hectare, improved crop rotation, irrigation schemes, seed selection and new seed varieties, vernalization, and the bringing into cultivation of new land—Siberia expects to extend its cultivated area by more than 1.6 million hectares this year—should also have an appreciable effect on this year's results.

This year Soviet agriculture is to be supplied with 67,000 tractors, or double the 1947 number, and it is reported that the output of tractors has already reached the prewar figure. It is also reported that there was a 35 percent increase in the supply of superphosphates, nitrates, and potash in 1947 as compared with 1946, with a further increase in fertilizer supplies promised for 1948. New superphosphate works have been completed or are under construction in the Kazak and Turkmen Republics. The output from these

areas will eliminate the long-distance transport of superphosphates from Leningrad and Moscow to the republics of central Asia.

In view of the favorable factors in the present situation, Soviet agriculture should not only sustain but improve upon last year's results.

Food availabilities this year should show a considerable improvement, with an appreciable rise in consumption levels. Bread, grains, sugar, potatoes, and vegetables should be comparatively plentiful, while supplies of vegetable oils will be much bigger this year. There is also reason to believe that Soviet grain exports from the 1948 harvest might reach 3 to 3½ million metric tons.

However, the restoration of livestock numbers is proceeding much more slowly than that of crop area, and recovery in this field was further retarded as a result of the 1946 drought. The difficult livestock situation will undoubtedly slow down expansion in the dairy, meat, and woolen industries and will restrict supplies of milk, cheese, animal fats, meats, hides, and wool.

The 1950 Agricultural Targets

The agricultural targets for 1950 with prewar production comparisons are set out in Tables 34 and 35.

It is planned to increase total farm output by 1950 to 27 percent above the prewar level (1940), which compares with an over-all increase of 48 percent in industrial production. The increase in the area sown to all crops, from 151 million hectares in 1940 to 159 million hectares in 1950, is not very great; likewise the increase in output of cereals is modest. It should also be noted that the target figures are not strictly comparable with the figures for 1940 since the former figures include the newly acquired territories along the European frontier. However, the increases planned for industrial crops are quite substantial, even after making allowance for territorial differences.

To enable farmers to reach the targets, 720,000 tractors (calculated in units of 15 h.p.) and 17 million metric tons of mineral fertilizers are to be supplied between 1946

TABLE 34.—U.S.S.R.: PREWAR AGRICULTURAL PRODUCTION AND TARGETS FOR 1950

Area and Crop	1940 (Prewar Territory)	1950	Increase	Average Yield in 1950
	(*Million hectares*)		(*Percentage*)	(*Quintals per hectare*)
Sown area—all crops	151	159	5	...
	(*Million metric tons*)			
Grain crops	119	127	7	12
Sugar beet	21.3	26	22	190
Sunflower seed	3.36	3.7	11	10
Raw cotton	2.48	3.1	25	18.4
Flax Fiber	0.575	0.8	39	4

TABLE 35.—U.S.S.R.: LIVESTOCK NUMBERS, 1938 AND 1945, AND PROJECTED NUMBERS, 1947–50

Livestock	1938 (Prewar Territory)	1945	1 Jan. 1947	1 Jan. 1948	1 Jan. 1949	1 Jan. 1950
	(*Million head*)					
Cattle	63.2	47.0	46.8	52.0	56.1	65.3
Sheep and goats	102.5	69.1	69.1	84.7	97.8	121.5
Pigs	30.6	10.4	8.6	13.4	20.3	31.2
Horses	17.5	10.5	10.8	11.9	12.9	15.3

and 1950—which compares with 512,000 tractors and 7 million tons of mineral fertilizer during the second five-year plan (1933-37).

The capital investment in agriculture over the five-year period (1946-50) is fixed at 19,900 million rubles. In addition, capital investments made by collective farmers will amount to 38,000 million rubles during the period of the current plan.

More than 2 million hectares of irrigated land, including over 600,000 hectares under new irrigation schemes, will be brought into cultivation during the period covered by the current plan. In addition, provision has been made for the drainage of over 600,000 hectares of marshlands between 1946-50. Meanwhile, virgin lands in Siberia will continue to be brought under cultivation.

Forestry and Forest Products

Official reports regarding the forests and forest industries of the U. S. S. R. are fragmentary. However, it is desirable to review such information as is available from the point of view of world timber economy. This vast country undoubtedly contains the largest reserves of coniferous timber to be found anywhere in the world. Before the war, Russian exports of sawn lumber were an important source of supply for western Europe, but the tremendous war devastation of forests and forest industries, on the one hand, and the acute need of timber for domestic reconstruction, on the other, have combined to reduce these exports to a very small figure, at least for the present. Official statements indicate that very great efforts are being made to restore and expand the forest industries. An article published in *Isvestia* in December 1947 declared that: "The country won, in 1947, the battle for coal; wood is, at present, the most important factor in the success of the five-year plan."

Production

The latest report of the commission administering the current five-year plan indicates that production indices, based on 1945=100, were as follows during the past two years:

Wood—in 1946	106;	in 1947	134
Paper—in 1946	161;	in 1947	201

Production provided for by the plan was reached within 2-4 percent, except that production of pulp and paper in 1946 exceeded the target by 10 percent.

According to the current five-year plan, production of roundwood is intended to reach a total of 280 million $m^3(r)$ in 1950. This is stated to be an increase of 59 percent over prewar production. Output of sawn timber in the last year of the plan should amount to 39 million $m^3(s)$. It is estimated that the quantity of the roundwood output required for sawing will amount to 65 million $m^3(r)$, leaving 215 million $m^3(r)$ for other industrial purposes and for use as firewood.

Unofficial estimates of the probable productive forest area of the U. S. S. R. are in the order of 600 million hectares, and perhaps one-half of this area can be classed as accessible at the present time. It is evident that a relatively modest annual growth rate of 2 $m^3(r)$ per hectare would permit an immense expansion of production whenever necessary facilities can be made available. Available information indicates that the center of production of the timber industry is tending to shift towards the eastern part of the country.

The five-year plan provides for the erection of new sawmills with an annual capacity of 6 million m^3, plywood factories with an output of 300,000 m^3, and a very large increase in the production of matches. In order to increase the efficiency of woods labor,

it has been laid down that 75 percent of the work done in felling timber and 55 percent of timber transportation shall be mechanized. To this end provision is being made for a very large output of electric saws, tractors, and trucks. New transportation facilities in the timber areas will include 6,500 kilometers of narrow-gauge railway.

Production of the paper industry should reach the prewar level this year, and the plan provides for an output of paper 65 percent higher by the end of 1950.

Exports and Imports

Before the war the U. S. S. R. exported relatively large quantities of wood, the quantity at one time exceeding 12 million $m^3(r)$, a large proportion of which left the country as roundwood. During the five-year plan 1927-1932 a tendency developed to limit exports to manufactured wood, and after the adoption of a new forest policy in 1936 annual exports fell to a total volume equivalent to 5.3 million $m^3(r)$. This policy provided that 54.2 million hectares, or nearly half the forest area of the then European territories of the U. S. S. R., mainly on the watersheds of major rivers, was to be set apart as protective forests. In part of this area felling was prohibited, and the remainder was placed under forms of management which excluded clear felling. The chief exporting areas were the White Sea and Leningrad regions. A contributing factor to the present low level of exports is the reduced productive capacity of the forests of the former exporting regions as a result of abnormally heavy exploitation during the war years. It is expected that if and when exports are resumed, most of the sawn lumber will come from regions farther to the east, notably the Yenissei River basin, which has an important sawmill center, Igarka. This port, however, has no rail connection and is open for only two months of the year; consequently, transportation of large volumes will be difficult.

Consumption

Although precise information is lacking, it is estimated that the average rate of consumption of forest products is in the order of 1,800 kilos per caput, and it seems likely that consumption will remain at this high figure for a long time to come. As present needs for reconstruction are satisfied, it seems likely that other domestic demands connected with an expanding economy will take their place.

Future Program

It is considered by some authorities that the adoption of a new forest policy in 1936 marked a turning point in the Government attitude toward forestry since it implied a change from mere exploitation to the introduction of more intensive forest management. The five-year plan currently in force gives marked attention to conservation, reforestation, and rational forest management. Extensive works are being undertaken to improve the swampy forest lands in the north by means of vast drainage systems which will discharge the excess water in the Volga and Don rivers. This will also have the effect of improving the flow of the rivers concerned and providing water for irrigation of agricultural lands to the south. Extensive planting of windbreaks is being carried on in the agricultural areas to prevent wind erosion. It is understood that intensive programs of forest research, with special attention to genetics, are being carried on.

In April 1947 a Ministry of Forest Economy was established which controls all state-owned and communal forests except those traditionally in the hands of the Kholkoz. It is intended that each republic of the Union will create a corresponding ministry.

Chapter 10

HIGHER-INCOME, DENSELY POPULATED REGIONS

EUROPE

EUROPE emerged from World War II with capital losses that have been persistently underestimated. Because industrial production, apart from Germany, is back to the prewar level, because bridges have been rebuilt and the railways are operating again, there is a misleading impression that Europe is already far along the road to recovery. On closer examination the situation is more serious. Some of the capital losses can never be replaced: for example, most of the overseas investments which were liquidated. Some of the industry cannot be rebuilt, but must be replaced by new industries which have a better chance of finding new export markets. And behind this lies the immense backlog of investment needs in houses, schools, hospitals, and other public services.

In the light of these facts most Europeans reckon upon a very long pull before attaining full economic prosperity again. In this effort there will be greater emphasis than ever before upon efficiency, in both industry and agriculture. Some 390 million people have to make a living while crowded into a small continent with only 0.4 hectares of cropland per person, with many of their mineral resources aproaching exhaustion after centuries of exploitation, and with many of their skills in manufacture taken over and adopted in other continents so that they are no longer European specialties. In this changed environment Europe will have an uphill struggle to recapture and improve on its prewar standard of living.

In agriculture Europe faces two problems, a production problem and a distribution problem. The production problem is to recover prewar levels of output and to go on further—especially in production of milk and other perishables, but also, if the economic climate proves unfavorable, in cereals and potatoes too. There is large scope in eastern Europe for a substantial expansion in food production, including a shift to more intensive crops and to livestock, and plans have been made for it. Even in Northwest Europe—the lands bordering the North Sea are among the most highly farmed in the world—there is room for improvement, especially in the use of grassland and in the quality of livestock.

The second problem concerns international trade, partly trade within Europe, but chiefly trade with the outside world. Most European countries achieve a comparatively high living standard by intense specialization and by exchanging a large quantity of manufactured products for raw materials and food. People in these countries are now asking themselves whether industrial progress in other continents during two world wars has perhaps whittled away the market for European goods, and whether food will con-

tinue to be scarce and expensive because of increased retention for consumption in the food-exporting countries. An added difficulty is, of course, the greatly increased dependence on supplies from the Western Hemisphere and the consequent dollar problem.

Nonetheless, some basis for specialization in Europe must be rediscovered if the European peoples are to enjoy again their accustomed standards of living. Europe must find some continents or countries willing to accept what it can produce and able to send in return the things it needs.

Within Europe there are great contrasts between the highly industrialized and specialized countries of the Northwest and the predominantly agricultural countries of the Southeast and Southwest. Population density ranges from 291 persons per square kilometer in the Netherlands to as low as 42 persons per square kilometer in Albania. Income levels also vary greatly from something over 500 U. S. dollars per person in the United Kingdom to just over 50 U. S. dollars in Greece and Yugoslavia.

Production

Though somewhat obscured by the effects of the unfavorable weather conditions which prevailed in successive postwar years, first in eastern and then in western Europe,[1] the present state of agricultural output in European countries is perhaps best illustrated by comparing current (i.e., average of 1946/47 and 1947/48) with prewar levels of food production.[2]

Over 100 percent of prewar—Sweden, Switzerland, United Kingdom
80-100 percent—Denmark, Norway, Netherlands, Iceland, Greece, Italy, Spain, Portugal
60-80 percent—Finland, Czechoslovakia, Austria, Belgium, Luxemburg, France
Under 60 percent—Germany, Poland, Hungary, Rumania

The low level of output in the East should be particularly noted; it reflects the proportionately greater amount of physical damage and general dislocation wrought by the war as well as by the drought of 1946. The situation in Greece appears relatively favorable, though the extent of recovery may have been overestimated because of the incompleteness of prewar data.

In western Europe the abnormally low output of cereals and other crops in 1947 proved a serious setback in the process of rehabilitation. Consequently, the agricultural output is still 10 to 25 percent below prewar except in the United Kingdom, Switzerland, and Sweden, the only European countries which were able to raise production above prewar levels. For Europe as a whole, net production of food remains some 26 percent below prewar.

Prices of farm products have risen sharply in almost all European countries during and since the war. They have risen more rapidly than the general level of prices, and

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[1] For the purpose of this report the countries of Europe have been divided into two groups, one including principally the high-income, more developed importing countries in western, central, and northern Europe; the other the low-income, less developed exporting countries in eastern and southeastern Europe.

In addition to the United Kingdom, Ireland, and Iceland, the first group comprises Norway, Sweden, Finland, Denmark, the Netherlands, Belgium, Luxemburg, France, Switzerland, Germany (all zones), Austria, Italy, Portugal, and Spain. The second group includes Poland, Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, Albania, and Greece. No classification fits exactly and this one contains anomalies. Denmark and the Netherlands are food-exporting, not importing, countries. Spain and Portugal are less, not more developed. Greece is a food-importing country. Czechoslovakia approaches western Europe in degree of industrialization and income level.

[2] For explanation of the construction of these index numbers, see the Appendix.

more rapidly than the prices of things farmers buy. Wages of hired farm labor, however, have become particularly high. In most European countries prices of farm products nowadays are fixed by governments, and there has been a tendency to establish somewhat higher prices for livestock products than for cereals, as compared with the prewar relationship. Thus in the Netherlands in the first quarter of 1948 the vegetable products price index was 271 (1938/39=100) and the livestock products index was 311. A rather similar situation has prevailed in Denmark, the United Kingdom, and Switzerland. On the other hand, in a country such as Italy, where prices have been decontrolled, the price relationship in the second quarter of 1948 was: cereals 3,944; meat 9,749; dairy products 7,037 (1938=100). In the countries which maintain price controls the difference largely reflects the increased costs of livestock production arising from the scarcity of protein feedstuffs. In the decontrolled countries the price differential reflects scarcity of livestock products in face of strong consumer demand.

So far, production prospects for the 1948/49 season are extremely favorable throughout Europe. From preliminary returns now available, it would appear that the production of bread grains in Europe this year will exceed 1947 production by about 15 million tons. About 75 percent of this increase affects importing countries. Noteworthy examples of better prospects are France and Italy. The new crop in France is estimated to be over twice as large as last year's, while in Italy the outturn is expected to be about 30 percent larger than in 1947. These results are due to exceptional weather, however, and somewhat exaggerate the degree of recovery really attained by this date.

The outlook for coarse grains, sugar beets, and potatoes is equally favorable. As larger supplies of feedstuffs become available for livestock, output of livestock products may also recover more rapidly than during the past two years. Thus, over-all production may show considerable improvement during the coming year, and in several countries approach prewar levels.

International Trade

The traditional position of western and eastern Europe from the point of view of foreign trade has already been suggested in the footnote on page 99. Although there are some anomalies, they do not appreciably affect the net import position of western Europe on the one hand, or the net export position of eastern Europe on the other.

The postwar shortage of basic foodstuffs throughout Europe meant that insignificant amounts of food were available to the importing countries in western Europe from the European food-exporting countries. In western Europe there are by now some 11 million more people than before the war on a reduced land area (resulting from the change in Germany's frontiers). In eastern Europe, production was so low that many countries were anxious to import food from outside Europe in order to maintain food consumption at least at minimum levels.

A comparison of current levels of imports (i.e., average of 1946/47 and 1947/48) with prewar shows the following characteristics of change for individual countries:[3]

Imports over 100 percent of prewar	Germany, Italy, Spain, Portugal, Poland, Czechoslovakia, Rumania
80-100 percent	Finland, France, Yugoslavia, Greece
60-80 percent	Norway, Sweden, United Kingdom, Belgium, Luxemburg, Switzerland
Under 50 percent	Denmark, Netherlands, Ireland, Austria, Hungary, Bulgaria

[3] For explanation of the construction of these index numbers see Appendix.

UNRRA shipments accounted for most of the expanded food imports into countries like Czechoslovakia, Italy, Poland, and Yugoslavia in 1946/47, but this ceased early in 1947.

In none of the major prewar importing countries—the United Kingdom, Norway, Denmark, the Netherlands, Switzerland, Austria—has the volume of imports exceeded 80 percent of prewar and in certain countries it has remained far below this level. Large food imports into western Germany were needed especially because of the discontinuation of food shipments from the agricultural districts of eastern Germany transferred to Poland and the U. S. S. R.

In eastern Europe in 1946/47 there was a net import of 1.1 million tons of cereals, compared with an annual net prewar export of 3.1 million tons. Fats imports were double prewar. Meat imports were high, contrasting with a prewar net export, and there were large imports of processed milk. In 1947/48, UNRRA shipments having ceased, the import of meat disappeared except in Czechoslovakia, but that of cereals remained high. (See Table 42.)

Exports of food from eastern to western Europe have not yet been resumed on any large scale—they do not exceed 25 percent of prewar—because of the low level of production and other factors such as land reforms, overvalued currencies, and reparations. Following the good harvest of 1948 more food is likely to be exported.

In western Europe during the past two years, the imports of grain, sugar, and fats were smaller than prewar and those of meat, eggs, and dairy products larger. Imports of grain, sugar, and fats have been limited by physical availabilities and subject to the allocation procedures of the International Emergency Food Committee. The increased imports of animal products represent a partial compensation for the great fall in exports from within western Europe, surpluses in Denmark and Ireland being not much more than one-half of prewar and those of the Netherlands very much less.

A substantial shift has occurred in western Europe's sources of supply. Before the war this area obtained about one-quarter of its food imports from other European countries, a source which for the time being has run almost dry. An important part of the remainder was obtained from colonial and other areas in Africa and southeast Asia, both of which regions are at present exporting much less. Consequently, western Europe now relies very heavily on the Western Hemisphere. It is this shift in sources of supply, coupled with the temporary decline in Europe's exports of goods and services, as well as the contraction of multilateral world trade, which creates a shortage of foreign currency, particularly dollars. There is the additional difficulty of the change in terms of trade—many European countries, except the United Kingdom, now have to give a larger volume of their exports for a given quantity of food imports than they did before the war. This high level of food prices is likely to create increasing buyer resistance on the part of the importing countries, especially as the domestic food supply improves after a good harvest in 1948. However, even if world food prices become more moderate, the dollar problem will still remain, and the importing countries are already taking action to shift some of their purchases to non-dollar areas, especially Africa. In this connection, the U. S. S. R. and some countries in the Near East may also become sources of particular importance.

Consumption

The estimates of European food supplies available per person in 1947/1948 show no over-all change from the previous year, an improvement in eastern Europe being offset by a worsening in some parts of western Europe. Table 36 shows supplies for each of

TABLE 36.—SUPPLIES OF MAJOR FOODSTUFFS IN EUROPEAN COUNTRIES, PREWAR, 1946/47, 1947/48, AND 1950/51

Country and Period	Bread Grains [1]	Rice [1]	Coarse Grains [1]	Total All Grains [1]	Potatoes	Sugar [2]	Pulses	Fruits	Vegetables	Fats and Oils [3]	Meat [4]	Liquid Milk [5]	Cheese	Eggs	Fish [9]
	(*Kilograms per caput per year at the retail level*)														
Austria															
1934–38	120.7	4.0	7.2	131.9	85.3	24.0	2.2	60.3	57.4	14.1	53.6	194.1	3.7	6.6	1.0
1946/47	93.2	—	26.0	119.2	87.5	6.3	3.4	109.5	51.3	7.3	20.8	*131.0	1.3	1.9	0.4
1947/48	116.5	0.6	10.7	127.8	44.5	8.8	8.1	69.7	71.4	10.4	24.8	*106.8	0.7	1.8	2.0
1950/51	142.6	4.0	0.7	147.3	106.5	21.3	1.4	63.9	56.9	12.7	38.0	116.7	2.8	6.0	1.7
Belgium															
1934–38	112.6	6.6	2.6	121.8	168.7	27.8	4.7	26.0	40.0	19.2	43.6	*89.6	3.7	7.5	9.0
1946/47	104.0	—	6.0	110.0	120.5	25.3	2.6	40.0	80.0	17.2	38.8	*96.3	2.3	5.3	10.2
1947/48	97.9	1.0	9.6	108.5	142.9	25.8	1.7	40.0	80.0	17.5	43.9	*90.7	1.9	5.2	10.2
1950/51	114.7	5.8	0.2	120.7	168.6	25.6	4.9	40.0	80.0	19.2	43.6	*116.6	4.1	7.0	9.8
Bulgaria															
1934–38	177.1	2.1	43.1	222.3	8.6	2.5	11.3	36.8	85.7	8.1	22.4	73.0	4.9	4.4	1.0
1946/47	185.5	1.7	15.4	202.6	1.7	4.3	4.8	68.0	33.5	5.1	19.1	34.6	3.7	1.6	0.6
1947/48	127.8	2.8	40.4	171.0	3.1	4.6	5.6	50.0	38.0	5.9	18.5	61.3	4.5	3.5	0.7
1950/51	164.2	3.2	44.1	211.5	11.0	6.2	11.0	27.6	57.9	8.5	26.1	76.4	5.2	1.4	0.7
Czechoslovakia															
1934–38	124.3	3.9	2.0	130.2	159.9	23.6	3.6	42.1	41.4	13.7	33.3	*106.2	3.0	7.6	1.2
1946/47	138.9	—	—	138.9	153.6	22.4	0.9	26.6	38.8	8.1	35.1	*†217.4	1.2	4.6	0.2
1947/48	126.4	—	—	126.4	148.1	17.4	1.4	23.9	25.3	11.1	32.3	*132.7	1.0	4.1	2.6
1950/51	150.0	4.3	—	154.3	155.0	25.0	2.4	32.6	40.8	18.3	44.2	*153.6	2.4	8.0	1.5
Denmark															
1934–38	85.8	2.2	5.9	93.9	106.5	50.5	—	32.8	61.8	26.6	74.6	168.0	5.4	7.5	15.0
1946/47	91.0	—	16.4	107.4	122.5	38.0	0.5	41.9	71.1	19.2	63.6	191.1	8.6	9.5	12.9
1947/48	70.0	—	32.9	102.9	134.1	38.1	0.5	29.3	73.8	18.7	62.2	176.2	8.8	11.9	17.9
1950/51	81.2	3.3	10.5	95.0	92.3	48.6	0.5	47.9	76.7	27.6	75.4	183.7	7.0	8.1	16.3
Finland															
1934–38	112.1	3.6	12.3	128.0	180.8	28.2	3.3	36.6	30.0	13.1	32.3	260.3	2.2	3.0	6.0
1946/47	133.4	—	12.7	146.1	177.6	10.5	1.1	14.7	28.4	7.8	20.8	*257.9	1.5	1.0	6.3
1947/48	118.6	—	18.0	136.6	178.9	15.0	1.5	14.2	27.4	9.2	20.8	*223.5	1.5	1.5	7.1
1950/51	101.5	3.0	11.0	115.5	159.6	25.9	1.5	13.7	27.4	10.6	23.6	311.7	2.5	3.7	5.5
France															
1934/38	123,0	2,4	1,9	127,3	167,1	23,9	6,0	29.6	143.4	14.0	51.9	*85.8	5.3	9.0	8.0
1946/47	117,5	0,3	5,4	123,2	158,2	14,6	5,0	23.4	149.6	9.1	44.1	73.2	3.3	8.1	4.7
1947/48	93,7	0,2	6,0	99,9	159,8	15,3	3,3	26.8	137.0	10.4	44.6	69.1	2.9	7.9	5.4
1950/51	110,5	0,5	1,9	112,9	154,4	20,1	5,3	36.3	152.0	14.2	51.4	*127.0	7.1	9.7	6.7

Germany															
Total—1934–38 (prewar boundaries)[7]	107.8	2.5	1.4	111.7	176.0	24.0	2.3	35.9	50.0	22.7	50.9	114.6	5.0	7.2	12.0
Bizone															
1946/47	94.5	—	19.6	114.1	132.9	8.6	1.7	27.5	40.7	5.4	18.5	*120.2	2.4	1.3	5.5
1947/48	116.8	—	12.6	129.4	133.8	15.7	3.1	30.9	44.2	5.4	14.7	*88.2	2.4	1.4	6.3
1950/51	128.5	1.3	13.1	142.9	204.4	17.4	5.3	36.9	44.2	14.1	30.4	*78.4	3.5	1.3	7.1
French Zone and Saar															
1946/47	82.0	—	16.5	98.5	160.7	9.6	0.5	33.7	36.0	6.2	16.6	*118.3	2.5	2.3	3.1
1947/48	86.2	—	16.8	103.0	138.6	5.2	2.1	37.9	39.4	4.1	16.7	*115.2	2.3	2.4	3.0
1950/51	—	0.8	—	142.2	187.7	13.4	0.5	47.7	50.8	14.7	29.1	*81.8	3.1	4.5	7.8
Soviet Zone															
1946/47	88.3	—	11.4	99.7	205.4	16.2	1.6	17.3	60.5	4.3	11.6	*91.9	3.0	1.9	1.0
1947/48	83.8	—	21.3	105.1	205.8	14.4	1.6	21.4	69.5	4.3	12.3	*58.8	3.0	1.9	1.0
1950/51	114.1	—	7.0	121.1	213.2	30.0	2.5	18.9	63.1	7.9	20.7	*78.9	3.2	2.9	1.3
Greece															
1934–38	112.4	2.9	10.8	126.1	13.3	10.2	7.7	34.6	49.0	18.0	18.4	39.2	9.0	4.6	5.3
1946/47	110.7	0.4	26.1	137.2	25.3	8.0	5.1	31.3	56.8	12.4	12.6	*†42.4	4.8	2.9	6.6
1947/48	109.7	0.9	25.8	136.4	24.0	9.3	9.7	56.6	40.5	13.7	12.8	*86.4	5.3	3.0	7.7
1940/51	117.1	3.0	23.9	144.0	29.5	13.6	4.9	68.9	73.0	16.6	22.4	33.1	6.9	2.2	7.2
Hungary															
1934–38	148.3	2.6	13.5	164.4	89.5	10.2	6.4	51.6	43.3	10.1	34.1	111.0	0.6	6.4	0.9
1946/47	111.8	0.5	39.0	151.3	44.1	7.1	6.8	26.4	22.0	6.1	19.9	*51.9	0.3	5.2	0.2
1947/48	117.1	4.1	53.8	175.0	88.7	9.7	7.0	34.7	26.7	6.8	23.0	64.5	0.5	3.7	0.5
1950/51	152.1	2.0	2.3	156.4	81.8	12.0	12.7	50.8	38.1	10.2	30.5	72.2	0.8	5.8	1.0
Iceland															
1934–38	95.7	6.0	27.6	129.3	60.3	[8]45.7	0.9	4.4	16.5	17.6	38.9	*257.8	2.6	2.6	34.5
1946/47	—	3.8	—	111.5	52.3	38.5	—	20.8	12.3	24.1	52.4	*215.4	2.3	2.3	30.8
1950/51	68.1	3.0	23.8	94.9	57.8	[8]41.5	—	14.1	14.8	32.8	51.0	*259.2	3.0	2.2	29.6
Ireland															
1934–38	123.2	1.0	3.4	127.6	197.0	37.7	0.7	29.0	70.7	15.0	47.6	*246.7	0.7	13.5	2.5
1946/47	129.6	—	3.4	133.0	200.0	24.2	0.7	27.6	74.1	16.0	57.2	*226.2	1.0	13.1	2.7
1947/48	129.2	0.3	4.4	133.9	187.9	27.9	0.7	36.9	73.8	15.2	53.7	*216.5	1.0	13.4	3.7
1950/51	125.7	1.3	4.0	131.0	196.7	42.0	1.0	33.3	76.7	18.0	53.3	*253.3	1.3	13.3	4.0
Italy															
1934–38	138.9	10.4	27.9	177.2	36.6	7.1	13.3	27.9	55.8	11.5	19.6	†36.3	5.2	7.6	5.9
1946/47	123.1	7.3	21.1	151.5	28.1	6.2	7.3	37.0	59.2	7.3	12.2	†30.7	3.6	5.2	4.3
1947/48	113.3	9.2	18.0	140.5	36.3	6.5	8.0	37.6	63.1	10.3	13.7	†30.3	4.2	5.4	5.5
1950/51	150.9	22.7	8.1	181.7	32.0	7.2	11.7	23.8	73.7	11.0	16.0	†42.2	4.1	6.6	5.7

See footnotes at end of Table.

TABLE 36.—SUPPLIES OF MAJOR FOODSTUFFS IN EUROPEAN COUNTRIES, PREWAR, 1946/47, 1947/48, AND 1950/51—Cont.

Country and Period	Bread Grains [1]	Rice [1]	Coarse Grains [1]	Total All Grains [1]	Potatoes	Sugar [2]	Pulses	Fruits	Vegetables	Fats and Oils [3]	Meat [4]	Liquid Milk [5]	Cheese	Eggs	Fish [6]
Luxemburg															
1934–38	100.0	5.0	3.3	108.3	150.0	26.7	3.3	47.3	61.3	21.9	55.0	136.7	2.3	9.3	5.1
1946/47	118.3	0.7	—	119.0	150.0	25.3	3.0	35.7	56.3	17.3	33.6	126.7	3.0	5.3	3.9
1947/48	110.7	1.0	8.0	119.7	150.0	26.7	0.3	49.0	58.3	17.6	35.7	123.3	2.7	6.0	4.6
1950/51	101.3	5.0	3.7	110.0	150.0	26.7	3.3	52.7	68.7	21.0	47.0	140.0	2.3	9.3	5.5
Netherlands															
1934–38	86.2	5.1	7.1	98.4	130.6	33.5	2.7	41.7	64.1	22.0	39.6	*139.6	6.6	5.8	7.6
1946/47	111.0	—	13.5	124.5	150.0	24.0	2.0	37.9	70.0	15.3	23.2	158.2	6.1	3.9	11.0
1947/48	93.1	0.5	14.4	108.0	155.1	25.9	1.7	34.2	69.4	17.8	23.3	154.5	6.6	4.7	10.4
1950/51	86.7	4.1	5.2	96.0	130.5	32.0	3.0	53.0	83.5	21.0	35.4	200.8	6.8	7.0	8.1
Norway															
1934/38	106.6	1.7	10.7	119.0	119.7	30.3	2.4	33.1	19.3	25.6	37.9	169.3	5.5	6.9	21.0
1946/47	96.1	—	9.0	105.1	156.8	21.6	2.9	31.3	21.9	20.2	27.0	*220.1	3.2	3.2	25.2
1947/48	107.9	—	10.1	118.0	121.5	25.3	2.5	23.7	24.4	22.4	26.2	214.4	3.5	4.7	26.9
1950/51	106.6	1.5	7.0	115.1	113.6	30.3	2.4	31.8	22.7	23.2	31.1	203.0	5.5	6.7	21.2
Poland															
1934–38	132.0	1.2	1.0	134.2	285.0	8.5	9.3	31.4	37.7	7.4	26.0	162.2	2.0	3.7	2.0
1947/48	106.6	—	9.7	116.3	281.6	9.6	1.1	40.0	45.0	5.3	19.5	80.4	1.9	2.6	2.9
1950/51	177.5	0.8	—	178.3	294.6	12.0	3.0	30.0	40.0	7.4	20.4	*109.8	1.6	8.5	3.
Portugal															
1934–38	58.3	6.8	38.1	103.2	76.4	10.1	9.9	61.4	80.0	12.5	23.0	†37.1	1.9	2.2	15.4
1946/47	77.2	4.9	65.6	147.7	72.1	8.3	12.9	56.9	64.9	11.0	19.6	†38.7	1.3	1.6	13.0
1947/48	71.5	8.1	49.0	128.6	72.3	8.1	9.9	48.1	64.1	13.9	18.3	37.8	1.0	1.9	12.8
1950/51	75.4	7.7	58.3	141.4	70.4	12.3	11.7	55.6	80.2	9.7	22.1	38.3	1.9	2.1	9.3
Rumania															
1934–38	91.8	1.1	109.2	202.1	41.5	5.2	6.9	74.5	63.8	5.5	18.2	100.0	3.1	5.4	1.0
1946/47	79.5	0.4	52.3	132.2	15.8	2.0	5.7	—	—	4.0	12.1	*72.3	1.9	1.3	0.5
1947/48	54.9	0.6	[1] 24.3	179.8	23.8	4.8	7.5	—	—	5.1	14.1	*93.3	2.5	2.8	0.5
1950/51	108.6	2.2	97.7	208.5	36.8	6.0	6.0	64.7	51.8	6.7	17.2	*128.8	2.9	2.7	0.7
Spain															
1930/34	128.5	6.5	11.4	146.4	109.4	11.6	14.6	50.0	100.0	14.7	28.1	†60.6	1.5	4.9	12.5
1946/47	114.5	4.5	10.0	129.0	83.1	6.0	11.8	46.0	73.5	14.9	22.9	†54.0	1.4	2.9	8.3
1947/48	94.0	5.3	13.7	113.0	74.5	4.8	13.5	48.2	72.7	15.1	20.2	†56.0	1.3	2.9	7.3
1950/51	126.4	7.3	12.1	145.7	98.8	11.5	18.9	49.0	90.9	12.8	25.4	†58.0	1.4	3.8	15.0
Sweden															
1934–38	85.4	1.7	13.5	100.6	122.2	44.1	1.9	30.1	50.0	17.1	47.4	250.3	5.6	8.1	23.3
1946/47	93.7	—	9.4	103.1	143.5	39.8	2.9	42.7	50.0	17.5	42.8	247.8	6.9	10.3	21.4
1947/48	76.8	0.2	17.7	94.7	132.5	37.0	1.6	29.0	50.0	15.4	41.4	260.2	7.0	10.3	24.8
1950/51	80.4	2.1	11.7	94.2	135.0	47.6	2.6	41.8	50.0	19.7	50.9	239.6	6.7	9.4	20.1

Switzerland															
1934–38	102.9	4.0	3.1	110.0	90.5	38.1	1.9	133.3	61.9	15.4	50.5	†242.3	8.5	8.8	1.0
1946/47	80.9	—	19.2	100.1	130.0	35.0	1.8	191.6	97.5	12.3	33.2	*239.1	9.4	7.0	1.8
1947/48	108.5	2.2	6.5	117.2	111.3	35.8	1.7	135.9	83.3	13.2	33.4	223.3	7.8	6.5	2.0
1950/51	96.0	3.8	11.3	111.1	74.5	40.0	1.9	121.0	75.5	15.7	43.3	243.0	8.5	7.7	1.4
United Kingdom															
1934–38	89.5	2.0	2.7	94.2	78.6	49.1	3.4	64.2	48.7	19.8	60.4	*120.2	4.0	10.9	12.1
1946/47	100.3	0.2	4.6	105.1	132.7	37.1	2.6	53.5	52.6	15.0	50.1	*164.8	4.3	9.6	13.9
1947/48	102.4	0.5	4.7	107.6	95.3	35.3	2.6	62.2	52.7	14.2	49.4	*156.3	4.4	10.2	15.1
1950/51	91.2	1.6	4.6	97.4	76.3	48.8	3.3	78.0	54.3	19.5	61.8	*166.3	5.2	11.6	15.9
Yugoslavia															
1934–38	103.1	1.6	123.8	228.5	55.1	4.5	5.3	29.7	58.9	5.9	20.6	116.7	3.1	2.1	0.2
1946/47	105.4	0.1	64.0	169.5	11.8	3.0	2.6	30.0	38.7	3.5	11.5	39.1	0.5	1.5	0.5
1947/48	91.3	—	84.4	175.7	10.4	3.7	3.8	30.0	40.0	3.8	15.2	38.6	1.3	2.2	0.6
1950/51	110.6	0.6	80.1	191.3	77.6	7.5	5.3	60.2	79.5	4.6	20.5	51.6	1.6	2.1	1.9
								Fruits and Vegetables							
European average [9]															
1934–38				136.0	127.1	21.3	6.4	106.8		15.1	39.0	108.2	4.1	7.0	7.8
1946/47				126.0	116.0	14.9	4.2	99.0		9.4	26.7	101.0	3.0	4.7	6.1
1947/48				125.1	111.5	15.5	4.7	99.2		10.1	26.5	92.8	3.1	4.9	6.8
1950/51				142.5	123.9	21.3	6.4	115.7		13.4	34.2	109.3	4.0	6.2	7.6
Principal importing countries [10]															
1934–38				128.3	105.1	26.5	7.2	120.5		15.9	42.4	100.8	4.3	8.1	9.6
1946/47				124.2	108.4	18.9	5.4	122.4		12.1	33.2	105.8	3.6	6.4	8.6
1947/48				116.1	99.6	18.8	5.4	120.5		13.1	33.2	101.2	3.6	6.7	9.4
1950/51				128.6	96.6	25.6	7.4	132.7		15.4	40.2	122.0	4.7	8.0	10.3
Principal exporting countries [11]															
1934–38				182.2	69.6	9.8	6.3	104.3		9.3	24.3	97.9	3.5	5.1	1.3
1946/47				152.4	44.5	7.6	4.1	54.7		6.0	18.2	81.6	1.7	2.7	1.1
1947/48				162.9	49.7	7.9	5.5	53.5		7.1	19.1	79.6	2.2	3.1	1.7
1950/51				180.9	70.3	11.5	6.5	109.9		10.1	26.2	91.9	2.9	3.8	1.9

NOTE: Some tentative estimates of consumption for 1950/51 have been included in this table as an indication of what is possible with the kind of data now being developed in European countries. It should be clearly understood, however, that these are notional figures and are in no way predictions of what consumption levels may actually be at that date.

* Figures include skim milk.

† Including milk from goats, ewes, or buffaloes.

[1] Milled basis.

[2] In terms of refined.

[3] Includes vegetable and marine oils, butter, and other animal fats, in terms of pure fat.

[4] Including poultry, game, and offal.

[5] Liquid milk from cows, including processed milk in terms of liquid.

[6] Figures represent fillet weight, except in the case of Bulgaria (1950/51), Czechoslovakia (1934–38, 1950/51), Germany (1934–38), Greece (1934–38), Italy and the Netherlands (all periods), and Poland (1947/48, 1950/51), where per caput consumption figures include fish at fresh weight.

[7] These figures have been included to facilitate comparisons with 1946/47, 1947/48, and 1950/51 nutrition levels in the zones.

[8] Including syrups.

[9] Germany and Poland are included in this weighted average but not in either of the two groups which follow.

[10] Includes Iceland, Ireland, United Kingdom, Norway, Sweden, Finland, Denmark, Netherlands, Belgium, Luxemburg, France, Switzerland, Austria, Italy, Spain, and Portugal.

[11] Includes Czechoslovakia, Hungary, Rumania, Yugoslavia, Bulgaria, and Greece.

TABLE 37.—NUTRITIVE VALUE OF FOOD SUPPLIES IN EUROPE, PREWAR, 1946/47, AND 1947/48

Country and Period	Calories		Protein			Fat
	Daily Supply per Caput	Percentage from Cereals and Potatoes	Daily Supply per Caput		Animal Protein Related to Total Protein	Daily Supply per Caput
			Total	Animal		
	(*Number*)	(*Percentage*)	(. . . *Grams* . . .)		(*Percentage*)	(*Grams*)
Austria						
1934–38	2,918	49	92.4	42.4	46	97.1
1946/47	2,101	62	67.4	21.4	32	46.0
1947/48	2,176	59	68.8	21.1	31	54.1
Belgium						
1934–38	2,969	52	82.9	36.2	44	96.9
1946/47	2,606	49	77.7	33.9	44	85.2
1947/48	2,674	49	79.1	33.1	42	88.6
Bulgaria						
1934–38	2,901	74	97.1	21.3	22	55.6
1946/47	2,471	78	77.7	11.8	15	38.1
1947/48	2,258	73	72.1	16.8	23	43.9
Czechoslovakia						
1934–38	2,721	58	74.0	27.2	37	74.8
1946/47	2,717	59	85.0	36.6	43	65.7
1947/48	2,441	61	72.9	28.3	39	65.4
Denmark						
1934–38	3,421	33	91.3	57.0	62	150.8
1946/47	3,223	39	101.4	57.9	58	130.2
1947/48	3,186	39	101.6	59.1	59	129.6
Finland						
1934–38	3,016	53	95.3	55.3	58	87.6
1946/47	2,618	65	91.9	37.6	41	62.4
1947/48	2,577	62	87.0	34.6	40	64.4
France [1]						
1934–38	2,979	53	90.7	36.4	40	84.5
1946/47	2,526	59	84.4	29.9	35	64.3
1947/48	2,322	54	75.1	29.7	40	66.9
Germany						
1934–38	2,920	48	80.4	37.3	47	111.4
Bizone						
1946/47	1,935	68	67.6	23.2	34	38.9
1947/48	2,102	69	72.7	19.2	26	34.6
French Zone						
1946/47	1,829	66	60.3	21.1	35	39.4
1947/48	1,752	69	64.4	21.7	34	34.1
Soviet Zone						
1946/47	1,875	68	59.4	16.5	28	30.9
1947/48	1,870	66	59.1	12.7	21	29.5
Greece						
1934–38	2,323	53	63.6	19.1	30	73.5
1946/47	2,139	64	64.8	16.4	25	56.1
1947/48	2,316	60	63.9	15.2	24	68.4
Hungary						
1934–38	2,748	63	80.8	24.7	31	70.9
1946/47	2,089	73	65.4	14.0	21	41.9
1947/48	2,522	73	75.0	15.9	21	49.9
Iceland						
1934–38	3,148	44	99.0	59.0	59	103.3
1946/47	3,016	39	95.2	57.8	61	121.5
Ireland						
1934–38	3,349	49	96.4	45.9	48	102.6
1946/47	3,237	51	104.2	49.7	48	108.9
1947/48	3,227	50	101.2	46.7	47	101.0

TABLE 37.—NUTRITIVE VALUE OF FOOD SUPPLIES IN EUROPE, PREWAR, 1946/47, AND 1947/48—Cont.

Country and Period	Calories		Protein			Fat
	Daily Supply per Caput	Percentage from Cereals and Potatoes	Daily Supply per Caput		Animal Protein Related to Total Protein	Daily Supply per Caput
			Total	Animal		
	(*Number*)	(*Percentage*)	(...*Grams*...)		(*Percentage*)	(*Grams*)
Italy						
1934–38	2,636	67	85.2	19.9	23	60.0
1946/47	2,123	71	68.6	14.0	20	41.3
1947/48	2,139	66	67.6	15.2	23	49.9
Luxemburg						
1934–38	3,094	44	80.4	37.7	47	125.2
1946/47	2,758	51	75.7	28.9	38	91.7
1947/48	2,813	51	76.2	29.6	39	95.6
Netherlands						
1934–38	2,958	44	76.1	36.9	48	114.7
1946/47	2,757	54	83.6	34.6	41	81.3
1947/48	2,693	50	77.8	34.4	44	86.4
Norway						
1934–38	3,179	44	86.5	45.9	53	118.0
1946/47	2,837	47	85.7	47.0	55	101.1
1947/48	2,952	46	92.0	47.9	52	107.7
Poland						
1934–38	2,710	67	78.7	23.2	29	61.9
1947/48	2,266	74	64.1	17.3	27	40.6
Portugal						
1934–38	2,114	54	65.5	22.0	34	66.9
1946/47	2,454	64	76.8	19.1	25	63.5
1947/48	2,279	60	67.8	18.0	27	66.1
Rumania						
1934–38	2,755	73	87.6	21.2	24	52.7
1946/47	1,684	77	56.2	13.6	21	32.3
1947/48	2,349	76	84.4	17.4	21	51.4
Spain						
1930–34	2,760	58	87.6	28.6	33	77.0
1946/47	2,361	59	73.8	19.7	25	70.7
1947/48	2,180	56	68.1	18.2	27	75.4
Sweden						
1934–38	3,171	42	99.5	61.1	61	116.6
1946/47	3,185	40	104.1	59.9	58	115.1
1947/48	2,997	39	102.5	62.6	61	110.6
Switzerland						
1934–38	3,151	40	93.3	51.4	55	104.7
1946/47	2,986	41	91.4	47.1	51	87.4
1947/48	3,057	44	90.2	43.8	49	93.7
United Kingdom						
1934–38	3,095	35	81.6	45.1	55	122.5
1946/47	2,907	43	91.3	47.7	52	97.3
1947/48	2,842	43	90.5	47.6	53	97.2
Yugoslavia						
1934–38	3,013	77	94.0	20.8	22	59.6
1946/47	2,017	82	61.5	9.2	15	29.2
1947/48	2,141	80	64.9	11.2	17	34.0

[1] Although the calorie value of available supplies compiled from official production figures available at the time of writing shows a decline between 1946/47 and 1947/48, nutritional surveys in certain districts show some improvement in the diet.

the two regions. Germany and Poland, although included in the European total, are not included in either the western or eastern group because of boundary changes and because in the case of Germany the abnormally low present level of consumption would unduly distort the group averages. As between 1946/47 and 1947/48, consumption of bread, potatoes, meat, and fats increased notably in eastern Europe. In western Europe consumption of bread, potatoes, and milk declined. Within each region, however, there were some wide differences; for example, the very great improvement over the previous year in Hungary and Rumania contrasts with a decline in consumption levels in Czechoslovakia and Bulgaria.

In most countries the percentage of calories obtained from cereals and potatoes remains very high—in some significantly higher than prewar. Intake of animal protein continues to be abnormally low compared with prewar, particularly in Austria, Hungary, Finland, Yugoslavia, Spain, and Germany. (See Table 37.)

There has, however, been a steady improvement in the health of the people in Europe over the last 12 months. In most countries the average heights and weights of children were found to surpass the levels of the previous postwar years, although the prewar levels had not in many cases been reached. The children of school-going age were usually found to have improved more than the adolescents. While in the Netherlands the average heights and weights of school children were back to prewar levels, there is evidence that in the United Kingdom the adolescents were on the average lighter in 1947 than in 1945. In Finland, Greece, and Germany the adolescent group appears to be the most underweight and underheight.

Infant mortality rates continue to decline as the figures in Table 38 show. There has been increasing emphasis on maternal and infant welfare in the health services in several countries, which is reflected in these figures.

TABLE 38.—INFANT MORTALITY RATES IN SELECTED EUROPEAN COUNTRIES

Country	1937	1946	1947
	(*Mortality per thousand live births*)		
Austria	92	81	76
Belgium	83	75	75
Bulgaria	150	124	...
Czechoslovakia	117	109	...
Denmark	66	46	...
Finland	69	56	59
France [1]	65	73	66
Hungary	134	114	111
Italy	109	84	82
Netherlands	38	39	34
United Kingdom	61	43	...

[1] Excluding live-born infants who died before being registered.

Tuberculosis continues to be a major problem in some countries, such as Poland and Czechoslovakia. Deficiency diseases are still found in some areas—for example, pellagra in Rumania—but the incidence is lower than in previous years.

Rationing of basic foods is still in force in most European countries. Some countries make allocations according to physiological needs, as in the United Kingdom; others use rationing as a form of wage supplements, as in Poland, or to provide incentive for work of certain types, as in Germany. Most countries, however, make provision to some extent for the vulnerable groups in the population, and some have steeply differentiated allowances, especially of milk, as in Germany and Finland. While some countries, like Italy, are completely or partially de-rationing certain foods, others are finding it necessary to impose more stringent controls. Greece plans to include a greater number

of foods in its ration scheme and Czechoslovakia has had to ration potatoes, vegetables, and cheese and to cut rations of other foods drastically.

Community feeding, chiefly of children and workers, is expanding in Europe. Among the outstanding developments in this field is the program assisted by the United Nations International Children's Emergency Fund, which operates in 12 countries, mostly in eastern, central, and southern Europe. The most needy children receive a meal consisting of protective foods (notably dried skim milk) provided by UNICEF, matched by local foods of equal calorie value provided by the government of the country. This scheme now includes about four million children; without its help the feeding of these children could not be continued in many of the areas where the need is greatest. The meals are often of a very simple type, such as the breakfast, used successfully in Greece, of a milk drink and a slice of milk-raisin bread.

Another outstanding development is in the United Kingdom, where the number of school children receiving school meals has risen from 4 percent of the total prewar to 52 percent in 1948; in addition, 88 percent now receive free school milk. Like the United Kingdom, Finland is introducing a decree making it compulsory for schools to supply meals. In Norway the "Oslo breakfast," a simple meal of high nutritional value, is served free to school children; in Oslo itself, 91 percent of the school children participate in this scheme. Half the children in Bizonal Germany have a ration-free school meal. These various school feeding programs have been shown to have a beneficial effect on the health and growth of children.

The feeding of workers, begun in many cases as an emergency measure during the war or in the time of acute shortages which followed it, has spread throughout Europe and promises to become a permanent institution in many countries.

There is a widespread interest in nutrition education in Europe, but many countries are handicapped in developing projects of this kind by lack of staff and of funds, and sometimes by lack of co-operation among the people who would necessarily have to carry them out. Several countries, including the Netherlands and the United Kingdom, now have permanently established organizations for nutrition education; others, like Greece, are just embarking on this work. Programs of this kind must have aid from highly qualified people and it is interesting to note that several countries, among them Norway, are now teaching nutrition to medical students, while others are instituting university degrees in nutrition.

Programs for the Future

Production

All European countries have policies and programs designed not only to restore the prewar level of food production, but to bring agricultural efficiency to new high levels. In eastern and Mediterranean Europe the emphasis is upon increased crop yields (which have been less than one-half those of western Europe), diversification of crops, and improvement in the quality of livestock, notably dairy cattle, whose milk yields are likewise less than one-half as high as in the West. In western Europe the emphasis is largely upon better use of grassland, still better livestock, and increased cultivation of fruit, vegetables, and other specialty crops. Western European farming depends heavily upon the utilization of large supplies of raw materials, such as fertilizers and feedstuffs, most of which are normally imported from abroad. The future programs envisage a substantial increase in the production of these and also an increased use of tractors to make good the shortage of horses and manpower.

TABLE 39.—CHANGES IN EUROPEAN PRODUCTION OF MAJOR CROPS [1]

Crop	Production Unit	Principally Importing Countries				Principally Exporting Countries				Total for Europe			
		1934–38	1946/47	1947/48	1950/51	1934–38	1946/47	1947/48	1950/51	1934–38	1946/47	1947/48	1950/51
Bread grains	1,000 hectares	25,156	22,063	21,754	23,380	18,675	14,633	15,565	18,401	43,831	36,696	37,319	42,781
	Indices	100	88	86	93	100	78	83	99	100	84	85	95
	1,000 metric tons	38,750	30,944	22,931	36,630	23,186	14,268	12,601	22,296	61,936	45,212	35,532	58,926
	Indices	100	80	59	95	100	62	54	96	100	73	57	95
Coarse grains	1,000 hectares	19,795	18,601	18,132	18,877	17,488	14,457	16,484	16,934	37,283	33,058	34,616	35,811
	Indices	100	94	92	95	100	83	94	97	100	89	93	96
	1,000 metric tons	34,175	29,681	26,710	33,826	23,217	11,783	18,557	21,788	57,392	41,464	45,267	55,614
	Indices	100	87	78	99	100	51	80	94	100	72	79	97
Total all grains	1,000 hectares	44,951	40,664	39,886	42,257	36,163	29,090	32,049	35,335	81,114	69,754	71,935	77,592
	Indices	100	90	89	94	100	80	89	98	100	86	89	96
	1,000 metric tons	72,925	60,625	49,641	70,456	46,403	26,051	31,158	44,084	119,328	86,676	80,799	114,540
	Indices	100	83	68	97	100	56	67	95	100	73	68	96
Potatoes	1,000 hectares	5,704	5,439	5,700	5,948	4,322	3,024	3,341	4,166	10,026	8,463	9,041	10,114
	Indices	100	95	100	104	100	70	77	96	100	84	90	101
	1,000 metric tons	80,607	70,419	71,247	89,131	53,597	30,289	29,587	48,919	134,204	100,708	100,834	138,050
	Indices	100	87	88	111	100	57	55	91	100	75	75	103
Sugar beets	1,000 hectares	1,237	1,172	1,264	1,415	494	505	602	669	1,731	1,677	1,866	2,084
	Indices	100	95	102	114	100	102	122	135	100	97	108	120
Raw sugar	1,000 metric tons	4,666	3,997	3,321	5,207	1,870	1,190	1,215	2,402	6,536	5,187	4,536	7,609
	Indices	100	86	71	112	100	64	65	128	100	79	69	116
Vegetables	1,000 metric tons	22,962	24,145	...	27,563	6,294	3,499	...	5,240	29,256	27,644	...	32,803
	Indices	100	105	—	120	100	56	—	83	100	94	—	112
Fruits	1,000 metric tons	10,505	10,600	...	10,949	5,211	3,056	...	5,242	15,716	13,656	...	16,191
	Indices	100	101	—	104	100	59	—	100	100	87	—	103

[1] For classification of the countries into two groups, see footnote on page 99. All figures refer to present boundaries.

The outstanding feature in eastern Europe's programs is the trend towards increased industrialization and the absorption into other occupations of parts of the agricultural population surpluses. This will indirectly aid agriculture by enabling the remaining farm families to have more farmland, whereas hitherto (see Table 43) their holdings were on the average uneconomically small, notably smaller than those of western Europe.

Against this background of industrialization, agricultural production is to be intensified and adapted to the requirements of the growing urban populations and to export markets. The area and output of cereals in 1950/51 is expected to be still below prewar, but the aim is to grow more potatoes, except in Poland and Czechoslovakia, where the prewar output was perhaps excessive. The programs aim for more sugar beets, oilseeds, and industrial crops, such as flax, hemp, cotton, and tobacco. The yields of crops will have largely recovered from their recent very low levels and, while it is intended to increase yields far beyond prewar averages, this is not expected to be possible until after 1951.

The number of horses and other draft animals will not have recovered fully in eastern Europe, nor are there any programs for the large-scale introduction of tractors. It is probable that draft power was somewhat excessive in many parts of this region before the war. Cow numbers will not have recovered fully but pig and poultry numbers are expected to be well above prewar. Meat output will have largely recovered, particularly pork, and there will be more fish available, but the output of milk and dairy products will still be significantly below prewar.

In western Europe as in eastern Europe the grain area and output in 1950/51 will still be slightly less than prewar. On the other hand, there will be more potatoes, more sugar, and more fruits and vegetables. Yields are expected to be higher than prewar, notably in France and the United Kingdom, and the plans of several countries are still more ambitious.

No attempt will be made in the West to restore the number of horses from present levels; instead a large increase in tractor numbers is projected. Numbers of cows and chickens will be above prewar; sheep and pigs will be below. The fall in sheep numbers is a universal phenomenon in the Western world, associated with increased intensity of land use and rising cost of farm labor. The program for pigs is framed in anticipation of difficulties in obtaining sufficient imported feedgrains. This is also reflected in the programmed milk output, which is not expected to regain the prewar level except in a few countries, owing to reduced yields per cow as a result of insufficient supplies of protein feeds. The plans indicate a certain change-over from butter to cheese production. As in eastern Europe, larger supplies of fish are programmed.

Considered as a whole, these production programs aim at an extremely rapid recovery from the condition in which agriculture was left at the end of the war, a recovery much more rapid than occurred after World War I. It must be emphasized that the plans on which these projections are based were first drawn up as long ago as the summer of 1947; many things have happened since, including the disastrous harvest of that year in western and central Europe and the consequent setback to the livestock industry. A number of governments have revised their programs, but not all these adjustments could be incorporated in this report because of delay in receiving governments' reports. The main change appears to be that the livestock production goals may not be realized until a year or two after 1951. This emphasizes that the goals shown for 1950/51 should be considered as goals for the early years of the 1950 decade rather than as goals for any precise year. During the next two years there may be other unforeseeable happenings which will either retard or accelerate the attainment of the goals.

TABLE 40.—CHANGES IN EUROPEAN LIVESTOCK NUMBERS[1]

Livestock	Unit	Principally Importing Countries				Principally Exporting Countries				Total for Europe			
		1934–38	1946/47	1947/48	1950/51	1934–38	1946/47	1947/48	1950/51	1934–38	1946/47	1947/48	1950/51
Cattle (including milk cows).	1,000 head...	74,033	70,147	68,341	76,538	27,270	18,068	18,617	21,833	101,303	88,215	86,958	98 371
	Indices.....	100	95	92	103	100	70	68	80	100	87	86	97
Milk cows.....	1,000 head...	36,488	34,268	33,744	37,919	14,921	9,171	9,661	11,640	51,409	43,439	43,405	45 559
	Indices.....	100	94	92	104	100	61	65	78	100	84	84	96
Sheep.....	1,000 head...	78,502	64,418	62,605	77,038	41,999	29,660	33,300	43,373	120,501	94,078	95,905	120 411
	Indices.....	100	82	80	98	100	71	79	103	100	78	80	100
Goats.....	1,000 head...	12,868	13,134	13,687	14,130	10,944	9,262	9,198	11,060	23,812	22,396	22,885	25 190
	Indices.....	100	102	106	110	100	85	74	101	100	94	96	106
Pigs.....	1,000 head...	52,331	32,465	32,706	46,436	23,928	14,491	17,369	28,452	76,259	46,956	50,075	74.888
	Indices.....	100	62	62	89	100	61	73	119	100	62	66	98
Chickens.....	1,000 head...	503,426	363,274	...	570,710	194,833	92,384	...	227,770	698,259	455,658	...	798.480
	Indices.....	100	72	—	113	100	47	—	117	100	65	—	114
Horses.....	1,000 head...	10,884	9,802	9,738	9,526	8,846	5,255	5,577	7,108	19,730	15,057	15,315	16.634
	Indices.....	100	90	89	88	100	59	63	80	100	76	78	84

[1] See footnote for Table 39.

TABLE 41.—CHANGES IN EUROPEAN PRODUCTION OF MAJOR LIVESTOCK PRODUCTS AND FISH[1]

Item	Unit	Principally Importing Countries				Principally Exporting Countries				Total Europe			
		1934–38	1946/47	1947/48	1950/51	1934–38	1946/47	1947/48	1950/51	1934–38	1946/47	1947/48	1950/51
Milk from cows...	1,000 m. tons.	80,516	64,011	58,009	80,755	22,397	8,826	10,682	16,971	102,913	72,837	68,691	97,726
	Indices.....	100	78	71	99	100	39	48	76	100	70	66	94
Meat, all kinds, including poultry.	1,000 m. tons.	11,183	7,372	7,280	10,072	3,248	1,638	1,924	3,042	14,431	9,010	9,204	13,114
	Indices.....	100	66	65	90	100	50	59	94	100	62	64	91
Eggs from chickens	1,000 m. tons.	1,930	1,306	1,374	1,911	463	228	326	471	2,393	1,534	1,700	2,382
	Indices.....	100	68	71	99	100	49	70	102	100	64	71	100
Butter.....	1,000 m. tons.	1,365	960	812	1,250	300	96	99	231	1,665	1,056	911	1,481
	Indices.....	100	70	59	92	100	32	33	77	100	63	55	89
Cheese.....	1,000 m. tons.	1,076	732	730	1,160	371	165	187	301	1,447	897	917	1,461
	Indices.....	100	68	68	112	100	40	52	83	100	61	64	105
Landings of fish, round weight....	1,000 m. tons.	4,739	4,425	...	5,699	85	80	...	229	4,824	4,505	...	5,928
	Indices.....	100	93	—	120	100	94	—	269	100	93	—	123

[1] See footnote for Table 39.

It should further be emphasized that agricultural production will not merely reach the programmed levels and then stand still; there is every indication that the increase in ouput of many crops and livestock products will be a continuing feature far beyond 1950/51 and that European agriculture will continue to improve in technical efficiency.

That this is the intention is seen clearly from the plans for the supplies of agricultural materials and equipment. For example, the fertilizer programs envisage a doubling of the production of nitrogen, phosphates, and potash between 1946/47 and 1950/51 and a level of consumption about two-thirds greater than prewar. This must mean that in due time the crop yields in western Europe, where most of the fertilizer is programmed to be used, will be substantially higher than in 1934-38. Again, a replacement of horsepower with tractor power is expected to proceed at such a pace that there will be some 900,000 tractor units in Europe in 1950/51 as compared with 267,000 before the war. This will mean more effective preparation and cultivation of the soil and indirectly will contribute to higher crop yields.

Already governments are collaborating under FAO auspices to study a number of technical questions involved in the programs. A conference on soil conservation has recently been held in Italy and another will be held in the same country on infestation control; in November 1948 a conference on animal diseases will be held in Poland and meanwhile the dissemination of hybrid corn continues in the Danubian countries.

International Trade

Plans regarding international trade are naturally less precise than those for production since international trade depends to a greater extent on factors outside the control of the governments formulating the programs. Eastern Europe expects to become again a food-exporting area of some consequence; although the projected net exports of grain in 1950/51 do not exceed 1 million tons, compared with 3 million prewar, yet the exports of meat, eggs, and sugar will be substantially above prewar, notably from Poland, Hungary, and Yugoslavia. This shift constitutes part of the intensification of agriculture noted above. These countries are endeavoring to process primary agricultural products such as cereals and to export instead the livestock products.

Many uncertainties attach to these export programs: pressure of increasing internal demand as a result of industrial development might reduce the export surpluses; some products might be exported to the U. S. S. R. rather than to the other parts of Europe. On the other hand, the industrialization programs of eastern Europe require large imports of machinery and other production equipment. Some of these requirements are already being met from western European countries, and supplies of agricultural commodities are being made available in return. The mutual economic advantage of these exchanges may provide the basis for an even greater expansion of intra-European trade than is at present envisaged.

In western Europe food imports in 1950/51 are expected to be larger than prewar, notably in grains, sugar, meat, cheese, and processed milk. The imports of rice and fats will still be much below prewar levels. The high figure for cereals is partly accounted for by the large quantities needed in western Germany and partly also by the increase in western Europe's population and the slight decline in its own grain production. The low figure for fats is explained entirely by the comparatively small tonnage programmed for western Germany, all other western European countries planning a return more or less to their prewar level of supplies. Western Germany is likewise responsible for most of the programmed increase in meat imports. All these figures must, however, be treated with considerable reserve, since they were based on certain assumptions made in mid-1947

TABLE 42.—NET TRADE OF EUROPE IN CERTAIN AGRICULTURAL COMMODITIES

Commodity	Principally Importing Countries				Principally Exporting Countries				Total Europe			
	1934–38	1946/47	1947/48	1950/51	1934–38	1946/47	1947/48	1950/51	1934–38	1946/47	1947/48	1950/51
	(*Thousand metric tons*)											
Bread grains	+10,964	+12,152	+16,866	+16,396	−1,470	+811	+1,786	−36	+9,494	+12,963	+18,652	+16,390
Coarse grains	+11,226	+4,288	+4,847	+10,407	−1,692	+309	−591	−987	+9,597	+4,597	+4,256	+9,420
Total all grains (excl. rice)	+22,190	+16,440	+21,713	+26,803	−3,099	+1,120	+1,195	−1,023	+19,091	+17,560	+22,908	+25,780
Rice	+915	+14	+84	+96	+191	0	+24	+91	+1,106	+14	+108	+187
Sugar	+2,566	+1,868	+2,064	+2,924	−237	−272	−154	−340	+2,329	+1,596	+1,910	+2,584
Oils and Fats	+3,250	+1,525	+1,882	+2,958	+51	+109	+110	+14	+3,301	+1,634	+1,992	+2,972
Meat	+1,333	+1,482	+1,476	+2,045	−83	+175	−24	−257	+1,250	+1,657	+1,452	+1,788
Cheese	+84	+190	+179	+160	−4	+8	0	+8	+80	+198	+179	+168
Eggs	+177	+235	+281	+34	−68	−8	−40	−96	+109	+227	+241	−62
Processed Milk	−139	+204	+215	+100	+2	+79	+78	+4	−137	+283	+293	+104

\+ Net imports.
− Net exports.

TABLE 43.—POPULATION AND AREA CHANGES IN EUROPE

Area and Population	Unit	Principally Importing Countries			Principally Exporting Countries			Total for Europe		
		1934–38	1947/48	1950/51	1934–38	1947/48	1950/51	1934–38	1947/48	1950/51
		Prewar boundaries	*Postwar boundaries*		*Prewar boundaries*	*Postwar boundaries*		*Prewar boundaries*	*Postwar boundaries*	
Total area	1,000 sq. km	3,734	3,564	3,564	1,425	1,294	1,294	5,159	4,858	4,858
	Indices	100	95	95	100	91	91	100	94	94
Total population	Millions	280	291	301	107	93	96	386	384	397
	Indices	100	104	108	100	87	90	100	99	103
Agricultural population	Millions	76	78	80	65	53	50	141	131	130
	Indices	100	102	105	100	82	77	100	93	92
Density: Total population	Persons per sq. km	76	82	84	75	72	74	76	80	82
Density: Agricultural population	Persons per sq. km	20	22	22	46	41	39	27	27	27
Arable land	1,000 sq. km	1,017	942	955	598	511	536	1,615	1,453	1,492
	Indices	100	92	94	100	85	90	100	90	92
Arable land per caput of total population	Hectares	0.36	0.32	0.32	0.56	0.55	0.56	0.42	0.38	0.38
Arable land per caput of agricultural population	Hectares	1.33	1.21	1.19	0.92	0.96	1.07	1.15	1.11	1.15

regarding the likely world supply position of these commodities and the possibilities of United States financial aid.

Denmark and the Netherlands anticipate a large recovery of their livestock industry for export, based almost as much as before the war on imported feed; Sweden and Finland plan not to resume the export of livestock products but rather to produce more food for internal consumption. A number of countries plan to increase their exports of fish, eggs, potatoes, vegetables, and fruits, though it is not clear which countries expect to increase their imports of these commodities.

As regards overseas sources of supply, the extent to which Europe may be able to shift from hard to soft currency areas is discussed in other sections of this report.

Consumption

Consumption goals for 1950/51 are especially tentative since any failure to fulfill either the production or the trade programs would be immediately reflected in levels of consumption. Both in eastern and western Europe the general trend seems to be that the average calorie supply in 1950/51, though somewhat above in Poland and Czechoslovakia, and significantly below in Finland, Germany, Austria, Hungary, and Yugoslavia, will return to about prewar levels. The diet in most countries should be better balanced than at present, particularly in certain countries with previously unsatisfactory nutritional standards. In eastern Europe a significant increase is anticipated in consumption of sugar and fats, which formerly was very low, and consumption of vegetables, fruits, and eggs will probably increase. In most of western Europe the wartime increase in potato consumption is likely to disappear and consumption of milk, vegetables, and fruits to rise. However, most governments have milk consumption targets which cannot be fully realized as early as 1950/51.

Countries are envisaging nutritional surveys and nutritional educational campaigns, but activities are as yet limited in many instances although surveys of diet and nutritional status should form the basis for national food-distribution programs. Similiarly, nutritional education can become a vital tool in improving living conditions. Some countries such as Poland, Czechoslovakia, and Italy are making a start in collecting data. During the past year Greece and Belgium have set up national nutrition organizations. There is an urgent need for standardization of field methods and agreement on criteria of nutritional status as the present results often convey no clear meaning.

Taking an over-all view, the future level of food consumption in Europe depends in large measure upon the extent to which these countries can expand their national production of industrial and other goods and on the success they achieve in finding export markets for part of their output. Europe's prewar standard of living, although unsatisfactory in many countries, was as high as it was only on the basis of considerable specialization of labor. The development of industries on other continents makes it increasingly hard for Europe to find new fields in which specialization is profitable. However, the rapid recovery of industrial production during the past year, coupled with a significant recovery in exports, does suggest that Europe may find ways of recapturing and even improving on its former standard of living in the changed conditions of the postwar world.

Forestry and Forest Products

The end of World War II left Europe with greatly increased needs for timber but with forests of reduced productive capacity.

The reasons for the increased needs are obvious. The reduction in productive capacity is due, in the first instance, to the damage caused to forests by military operations. It is estimated that in Italy, Poland, and France together 1.5 million hectares of forests were damaged or destroyed. Second, a considerable area of forest which formerly helped supply the needs of western Europe has been incorporated within the borders of the U. S. S. R. Finally, the forests of almost every country have been subjected to an exceptional drain, which is still continuing.

According to the best information available, there has been no irreparable damage involving the permanent loss of the protective influence of the forest except perhaps in Greece and Italy, where the forest resources were already insufficient. In the rest of Europe, productive capacity could be restored without undue difficulty if the relationship between supply from all sources and demand could be brought into equilibrium. The excessive felling of the past years does not exceed the volume of four or five years of annual growth; and European foresters, accustomed as they are to the practice of silviculture, would be able to deal with a problem of that magnitude. However, the rate at which fellings are still taking place cannot continue indefinitely without jeopardizing the very existence of Europe's forests.

The most encouraging development of the postwar years has been the way in which European countries have attacked their forestry problem, both individually and through the methods of international co-operation. The Marianske-Lazne Conference,[4] organized by FAO in 1947, initiated this co-operation and recommended the establishment of the two chief agencies which are now working to make it effective. These are the Joint FAO/ECE Timber Committee, which deals with short-term lumber supply problems, and the European Commission for Forestry and Forest Products, which is concerned with medium- and long-term forest policies.

The European Commission held its first meeting in July 1948 and received from each of the participating countries a comprehensive review of its present situation, current forestry trends, and planned future policy. This data made possible preliminary steps looking towards co-ordination of national policies throughout the region.

International co-operation in more limited fields has been marked by the organization or proposed organization of special bodies, such as the International Poplar Commission, the Chestnut Tree Commission, and the Commission for Mediterranean Countries. All of these are intended to study special problems of particular interest.

Production

The present rate of felling in the forests of Europe is estimated to be 307 million $m^3(r)$. This is about 15 percent in excess of the permissible cut, which is estimated to be 261 million $m^3(r)$, or 2.2 $m^3(r)$ per hectare.

The situation appears much more serious if industrial timber only, exclusive of fuelwood, is considered. Fellings of industrial timber total 171 million $m^3(r)$ against a permissible cut of 130 million $m^3(r)$, indicating an annual excess of more than 30 percent. This excessive cutting is necessary to meet pressing current requirements and, indeed, the Marianske-Lazne Conference itself recommended an excess cut of 10 percent for 1947/1948. But it is obviously essential to return to normal rates of felling at the earliest possible moment. This conclusion is valid for almost every country in the region.

To illustrate, Sweden has found through its current reappraisal of forest resources

[4] FAO, *Report of the International Timber Conference,* Washington, U. S. A., June 1947.

that it must contemplate a reduction of 30 percent in annual fellings in the forests of the north and a reduction of 5 percent for the whole country.

Germany, formerly a large importer of timber, has become since the war the largest European exporter. Nevertheless, the heavy fellings carried out in recent years have not endangered either the forests of the country or the protection of the soil, nor do they appear to have greatly reduced the productive capacity of the forest. The general forest inventory ordered by the Allies in 1946 showed that on 7.5 million hectares out of a total forest area of 9.6 million hectares (including all forests of more than 10 hectares each), the average stock of standing timber was 121 $m^3(r)$ per hectare. This figure is one of the highest in Europe, and may be compared with 53 $m^3(r)$ in Sweden and 51 $m^3(r)$ in the forests of Finland. However, total fellings have been estimated at 60 million $m^3(r)$ in 1945-1946 and 63 million $m^3(r)$ in 1947-1948, rates which are 70 percent above the normal estimated growth. It is evident that such high rates cannot be long continued without causing irreparable damage.

Mechanization of forest operations is not far advanced in many European countries and mechanical logging equipment, including tractors and trucks, is scarce or of obsolescent types. At the same time, manpower is scarce and difficult to recruit because of lack of warm clothing, shoes, and food adequate for heavy work. This problem is being dealt with by the FAO/ECE Timber Committee and marked improvements are hoped for in the near future.

For the long term it is expected that there will be a trend towards the establishment of forest combines in which all the products of a forest can be utilized in a diversified group of mills. Such combines already exist in the Scandinavian countries, and this approach has recently caused marked interest in Czechoslovakia and Yugoslavia. It is reported that Sweden has sold abroad all the equipment of at least two pulp mills whose needs for wood can no longer be met by the forests in the areas where they formerly stood.

Exports and Imports

It is surprising that, although Europe's production is on the whole insufficient for its needs, the Continent is still a net exporter of forest products. The surplus exported is in the form of wood pulp, the total production of which exceeds severely rationed consumption by a margin equivalent to 8-10 million $m^3(r)$.

The present shortage in Europe is, in fact, a shortage of coniferous lumber, though a shortage of pitprops may develop in the near future. At the same time, several countries need hard currencies so urgently that they constantly endeavor to increase their wood pulp exports. For example, Norway exported in 1945 the equivalent of 510,000 $m^3(r)$ and in the following year 1,940,000 $m^3(r)$. In 1947 its exports were probably higher since its pulp mills absorbed nearly half the marketable timber in the country. Since the same raw material may be used for wood pulp or for pitprops, and a portion of it may be used for lumber as well, the general urge to increase wood pulp exports tends to worsen the present shortages of the more critical commodities.

Though the work of the FAO/ECE Timber Committee has achieved some improvement in the immediate shortage of coniferous lumber, the outlook for the years to come remains grave. The European Commission for Forestry and Forest Products considers that there is now a gap of about 12 million $m^3(s)$ of sawn lumber between the possible production of Europe's forests and the real annual needs of the Continent, since imports from abroad will probably decline, and bridging the gap would mean a supplementary felling in the order of 25 million $m^3(r)$ in forests already overexploited.

It is undoubtedly possible to increase the productivity of Europe's forests, but this will take a long time. For the medium term the only apparent possible source of additional supplies would be the U. S. S. R.; the forestry situation in that country is therefore of special interest to Europe and the world.

Consumption

Consumption of forest products in 1946 was estimated to be 630 kilograms per caput, which is somewhat less than the rate of 1937. As an abnormally large proportion of total consumption was fuelwood (because of lack of coal), the decrease in per caput consumption of industrial wood has undoubtedly been substantial.

Great efforts are being made to save wood by more efficient utilization, and excellent results have been achieved by some countries through improved housing policies. Further possibilities in this direction are the subject of joint study by the FAO/ECE Timber Committee and other interested committees of the Economic Commission for Europe.

National Programs

It is clear that the European wood shortage is not merely a temporary crisis. Populations will increase, industries must be modernized, and living standards improved; the shortage will be permanent if special measures are not taken to deal with it. The European Commission recognized that in the long term the Continent must itself produce a sufficient volume of wood to meet its own needs. This could be achieved by:

(1) increase in production through better methods of silviculture and administration and through improved forestry legislation;
(2) extension of the forest area by afforestation of idle land; and
(3) better utilization and elimination of waste.

These three points can be illustrated from many national programs now under way. Norway, Italy, the United Kingdom, and the Netherlands have organized new research stations or improved old ones. Especially important research in forest genetics is being carried out in the Scandinavian countries. The International Poplar Commission has undertaken to co-ordinate research into the characteristics of this species, which is of great economic importance to southern and western Europe. Italy is making special studies of the chestnut blight, a disease which is a serious threat to forests essential to the agricultural economy. In Austria, Italy, and Norway means for improving forest laws are being studied, and all countries are giving special attention to the problem of introducing better management methods into forests under private ownership.

Almost every country has a large reforestation program. One of the most noteworthy is the British scheme, which proposes to reach a forest domain of 2 million hectares, including 1.2 million hectares of new plantations, in the next 50 years. It will embrace both nationally owned and private lands, and includes arrangements whereby private owners who "dedicate" their forests may receive substantial help in the establishment of plantations and necessary improvement works. The Forestry Commission has been reorganized and strengthened in accordance with its expanded responsibilities.

Concerning utilization, most of the European countries already have housing programs devised with the purpose of using the smallest amount of building lumber, and many of them are studying standardization of forest products. Reduction of waste will be achieved, also, in the long term by the policy of forest combines which, as has been mentioned, is receiving particular attention in eastern European countries.

The European Commission recommended the institution of a subcommission to

deal particularly with the special problems of the Mediterranean region. Of interest to this body will be a report published by the United Nations Relief and Rehabilitation Administration concerning the agricultural resources of the Vouraikos watershed in Greece.[5] The report shows that, whereas approximately 3,000 hectares out of a total area of 25,000 are now forested, stable agricultural development requires expansion of the forest to nearly 8,500 hectares.

The FAO Mission to Poland included a forestry expert, and its report[6] contained a comprehensive program for the rehabilitation of the Polish forests, which were so severely damaged by the war.

Progress

Most notable is the rapid progress of international co-operation in forestry matters which has been reported above. This has improved the distribution of available forest products and promises well for the future. Among actual forestry operations, reforestation has progressed remarkably in spite of short supplies of seeds and seedlings, lack of manpower, and sometimes lack of technically trained personnel.

In the important matter of privately owned forests, very significant steps have been taken in the past year in Finland. The Forestry Act, passed in 1938 and renewed every five years, had already given the Forest Service substantial appropriations for improvements in private as well as in national forests. On the other hand, "forestry associations," which enable private owners to use the services of trained foresters, were already well established. In 1947 these associations revived activities which had been hindered by war, and at the end of the year there were 317 such bodies with a membership of 37,000 private owners, covering 2 million hectares of forest. They employed 360 trained foresters in the management of 3.3 million hectares. A co-operative, instituted the same year under the name of the "Forest Union," will organize and administer the marketing of the products of private forests.

[5] UNRRA, *Ripe for Improvement, a Study of Marginal Land Farming in Greece,* Washington, U. S. A., 1946.

[6] FAO, *Report of the FAO Mission for Poland,* Washington, U. S. A., 1948.

Chapter 11

HIGHER-INCOME, SPARSELY POPULATED REGIONS

THE UNITED STATES OF AMERICA, CANADA, AUSTRALIA, AND NEW ZEALAND

THE COUNTRIES of this group are today, with Argentina, the most important exporters of food in the world. All of them have a vital interest in world markets—Canada, Australia, and New Zealand because a large proportion of their total production is exported, and the United States of America because its exports, although a small proportion of total production, constitute the balancing factor for several commodities that are produced in surplus of domestic needs. They are countries in which farming, being highly mechanized, gives a high output per man and the highest farm incomes in the world.

In all of these countries spectacular technical advances have been made. There may not be much additional productive land to bring into cultivation, but a great deal of what is cultivated could be used far more intensively. If there were a market, these countries could expand their agricultural output faster than any other countries in the world. But agricultural expansion is limited to a considerable extent in Australia and almost completely in New Zealand by the importing capacity of the United Kingdom, which is the only country in a position to import livestock products on a large scale; and expansion of production for export in the United States and Canada is limited by the fact that in large measure payment is required in dollars.

Agricultural production in Australia and New Zealand has been tailored to meet these limitations by means of long-term contracts, chiefly with the United Kingdom. Canada has, to some extent, done the same. The United States at present is able, partially at least, to plan its exports through the machinery of the Economic Cooperation Administration. For the time being, therefore, the situation is under control, but unless all these arrangements become permanent elements of government policy, the position could become highly unstable. For example, if planned export financing of the type of the European Recovery Program were at any time suddenly to cease, overseas demand for U. S. and Canadian foodstuffs (and other goods as well) might be immediately curtailed, with serious repercussions for both countries.

The questions which especially interest the world with respect to the United States and Canada are:

(1) Will agricultural production remain at present high levels and possibly expand further so that prices may moderate somewhat; or will production and export surpluses decline significantly and world prices remain high?

(2) What will be the import policy, particularly of the United States; will

it be such as to permit a larger volume of international trade financed in normal ways?

It is important for other countries to have some provisional answer because their long-term policies have to be shaped accordingly.

Production and Trade

United States of America

During the First World War farm production in the United States increased about 10 percent. Between the two wars this level rose by another 10 percent. In 1946 output was 30 percent higher than the 1935-39 average. Throughout this period the area devoted to crops, hay, and rotation pasture has remained relatively constant. The number of persons engaged in agriculture also remained at the same level until World War II and then dropped from about 30 million in 1940 to roughly 25 million in 1945. Production per unit of cropland increased in every five-year period with the exception of the drought years in the Thirties, and since then the increase has been at an accelerated rate. Production per animal unit shows a similar increase, and increase per worker employed has been at a steadily accelerating rate. The trend is toward ever greater efficiency in the production of food and other agricultural commodities.

Between the two wars exports of food from the United States of America were relatively small. Exports of bread grains were less than 7 percent of total production and made up a little over 3 percent of the total world trade in these commodities. In 1946/47, however, the United States exported 34 percent of its production of bread grains, and this was more than half of the total world trade in these commodities.

The upward trend in agricultural production is deep-seated and persistent. From time to time it is interrupted by adverse weather or economic conditions, but each recovery carries it to a new high point. The trend is not confined to one or a few commodities but shows itself throughout a wide range of agricultural products.

In the production of maize, the cultivated crop occupying the largest area in the United States, increased use of hybrid seed and improved cultural practices have resulted in a large increase since the prewar period despite a substantial reduction in area. The yield per hectare harvested has increased from a 1935-39 average of 14 quintals to 22 quintals in 1946-48, and the difference between area planted and area harvested has decreased from 1.7 million hectares in 1935-39 to only 0.9 million hectares in 1947. The area of wheat sown has shown considerable fluctuation since the end of World War II but, as in the case of maize, the yield per hectare harvested has increased and the difference between area sown and area harvested has decreased. This has contributed to the largest crop on record in 1947 and the second largest crop in 1948. A record crop of oats was harvested in 1946, but the area declined in 1947. Here again the persistent tendency toward larger yields and a reduction in the difference between areas sown and harvested is evident.

In vegetable production, again, a slight decrease in area has been more than offset by increased yields. In the case of potatoes, yields per hectare have increased from 78 quintals in 1934-38 to 124 quintals in 1946, and production of other vegetables in 1947 shows an increase of over 30 percent from an area 25 percent less than the average of 1935-39.

The production of oilseeds (including peanuts) in the United States has expanded considerably since prewar years. The area devoted to soybeans has almost

TABLE 44.—PRODUCTION OF PRINCIPAL CROPS IN FOUR COUNTRIES, PREWAR AND POSTWAR

Crop	United States				Canada				Australia			New Zealand		
	1935–39	1946	1947	1949[1]	1935–39	1946	1947	1949	Average 1936/37–38/39	1946/47	1947/48	1935–39	1946/47	1947/48[2]
	(*Thousand metric tons*)													
Wheat	20,637	31,381	37,148	28,849	8,502	11,259	9,275	10,886	4,482	3,192	6,205	182.7	122.5	122.5
Rye	1,141	480	660	711	234	224	335	254	—	—	—	—	—	—
Barley	5,195	5,710	6,078	5,987	1,936	3,242	3,079	3,701	213	263	370	18.8	57.0	57.0
Oats	15,173	21,742	17,650	18,144	5,214	5,723	4,298	5,398	308	283	635	50.7	47.2	47.2
Maize	58,817	82,552	60,987	76,203	178	272	170	305	185	147	150	7.9	10.1	...
Hay	71,719	91,389	92,986	...	10,200	20,600	21,900	...	...	...	...	...	...	...
Rice	1,018	1,474	1,620	1,368	...	...	...	...	43.8	57.2	38.1	...	...	...
Potatoes	9,675	13,177	10,462	9,934	1,700	2,200	2,100	...	373	497	554	120.1	117.6	...
Pulses														
Beans, dry	660	719	779	694	35	44	38	...	...	...	...	0.1	0.1	...
Peas, dry	117	307	295	272	35	63	49	...	...	...	...	12.2	33.5	...
Sugar (raw value)	1,809	1,768	2,003	2,000	69	100	79	...	821	621	614	—	—	—
Soybeans	1,529	5,478	4,936	5,579	...	...	...	...	...	...	...	...	...	...
Peanuts	558	925	1,021	...	...	...	...	...	...	...	...	...	...	...
Vegetables														
Fresh[3]	5,792	7,846	7,238	7,412	722	1,075	904	1,126	...	...	...	...	...	...
Processed[4]	3,183	5,008	4,963	5,171	116	270	190	252	...	...	...	...	...	...
Fruits														
Fresh, citrus	3,827	7,111	6,982	7,257	—	—	—	—	} 630	744	649 {	...	...	...
Fresh, other	8,144	9,442	8,984	8,890	397	552	462	...				...	...	...
Canned[5]	—	—	—	—	34	55	54	...	67.6	...	67	...	...	...
Dried	—	—	—	—	2	1	2	...	85	66	91	...	...	...
Tobacco	662	1,052	983	896	34.7	64.1	52.7	...	2.2	1.8	1.8	[6] 0.7	[6] 2.1	...
Flaxseed	279	574	1,010	757	38	163	310	...	...	...	...	0.5	4.6	4.6
Cotton (lint)	2,892	1,960	2,652	2,744	—	—	—	—	8.4	1.3	1.3	—	—	—

[1] Preliminary goal.
[2] Estimated production.
[3] In the case of the United States, includes 25 commercial vegetables.
[4] In the case of the United States, includes 11 commercial vegetables.
[5] Included in fresh fruits for United States.
[6] Contract acreage.

trebled and that given to flaxseed and peanuts has doubled between 1935-39 and 1947. At the same time yields of both soybeans and flaxseed have increased.

Tobacco production has increased considerably since 1935-39. Cotton area has declined, but production, owing to increased yield, has remained relatively stable. Table 44 summarizes trends in production of the more important crops.

Numbers of animals on farms have fluctuated considerably since 1910-14. During World War I cattle and hog numbers rose while other animal numbers remained relatively stable. Numbers fluctuated within relatively small limits until the 1930's, when shortage of feed supplies forced drastic liquidation. After 1938, numbers rose steadily until a record peak was reached in 1944/45. Certain classes of animals have not followed this general trend; numbers of horses and mules have declined steadily since 1918-22, and numbers of milk cows and sheep have declined from the 1935-39 average. Total cattle numbers, however, increased from a 1935-39 average of 67 million to a high of 85.5 million in 1945, and swine numbers from 44 million to 84 million in 1944. Since 1944/45 a steady decline in all animal numbers has taken place. The fluctuations are closely related to availability of feed supplies; and with the recurrence of bumper crops, numbers will probably show increases again.

While numbers of dairy cows have decreased, production of dairy products has increased considerably. In 1947/48, the same number of cows produced 10 percent more milk than in 1935-39; numbers of chickens increased 20 percent during the same period, but egg production rose 50 percent. Meat production closely follows changes in numbers of animals. Tables 45 and 46 summarize recent trends in numbers of the principal classes of livestock and output of the principal livestock products.

The major factors behind this common trend are clear. Most important is the increasing rate of mechanization on American farms. Before World War I most farm work was performed by animals or human beings, and only a few farms used tractors. Throughout the interwar period tractors and other farm machinery increased steadily in volume until today there are 2.5 million tractors together with millions of implements and attachments in use on farms in the United States. When World War II ended, farmers were using more than half again as many tractors as they had just before the war, and a large proportion of demand still remains unsatisfied. This factor alone has released some 22 million hectares of cropland from the production of feed for horses and mules to the production of food and fiber for human use. At the same time the use of tractors partially overcomes the effect of bad weather by enabling the farmer to plow, plant, cultivate, and harvest quickly when the weather is favorable. At the present time mechanization is still increasing and in certain regions is just beginning—for example, in the cotton and tobacco regions. It seems likely that this trend will continue to improve agricultural efficiency for some time to come. It is slowed to a certain extent by the fact that many farms do not lend themselves easily to machine working either because of size or type of soil or topographic conditions, but during World War II a considerable change in the size of farm units appears to have taken place. Between 1935 and 1945 the total number of farms decreased by 953,000; as will be seen in Table 47, all of this decrease appears to have occurred in farms of under 200 hectares, the greatest reduction occurring in farms of between 4 and 20 hectares.

At the same time the use of chemical fertilizer and of limestone has steadily increased. During World War II farmers more than doubled their use of fertilizer and trebled that of limestone. Further increase will undoubtedly take place as rapidly as production and competing demand will permit without undue disturbance of price relationships. The use of chemical preparations for the control of weeds and insects

TABLE 45.—LIVESTOCK NUMBERS IN FOUR COUNTRIES, PREWAR AND POSTWAR

Livestock Numbers	United States				Canada			Australia			New Zealand	
	1 January				1 December			31 March			31 January	
	1935–39	1947	1948	1950 [1]	1935–39	1946	1947	1935–39	1946	1947	1935–39	1947
	(*Thousand head*)											
Cattle (including milk cows)	66,814	81,207	78,564	75,000	8,246	9,016	8,944	13,478	13,878	13,427	4,365	4,634
Milk cows	24,999	26,098	25,165	23,500	[2] 3,959	[2] 3,717	[2] 3,667	3,233	3,024	3,013	1,772	1,658
Sheep and lambs	51,241	37,818	35,332	34,000	2,651	1,782	1,587	111,319	96,396	95,723	[3] 30,955	[3] 32,682
Hogs	43,932	56,921	55,038	...	[5] 4,078	5,459	5,381	1,182	1,426	1,273	755	546
Poultry [4]	411,143	481,091	467,483	416,000	[5] 55,649	53,119	49,805	...	...	...	4,019	...
Horses and mules	15,750	9,526	9,151	7,800	[5] 2,833	2,243	1,979	1,753	1,265	1,195	263	207

[1] Preliminary goal 1 Jan., 1950. [2] Milk cows and heifers over two years. [3] As of 30 April. [4] Includes hens, pullets, and turkeys only for U. S. and Canada. [5] 1 June figure.

TABLE 46.—LIVESTOCK PRODUCTS IN FOUR COUNTRIES, PREWAR AND POSTWAR

Livestock Products	United States				Canada [1]				Australia			New Zealand		
	1935–39	1946/47	1947/48	1949/50	1935–39	1946/47	1947/48	1949/50	1936/37–38/39	1946/47	1947/48	1935–39	1946/47	1947/48
	(*Thousand metric tons*)													
Meat														
Beef	3,147	4,582	4,447	4,536	281	443	414	431	578	494	495	143	191	213
Veal	471	704	705		53	57	54	59				23		24
Mutton and lamb	395	388	343	290	28	31	28	30	325	313	324	251	314	318
Pork (excluding lard)	3,328	4,765	4,758	4,563	288	362	460	443	96	103	102	48	38	25
Poultry	1,214	[2] 1,889	[2] 1,775	1,939	96	133	135	134	[3] 46	[3] 66	[3] 66	...	4	...
Offal	—	—	—	—	30	40	41	36	49	45	45	...	17	...
Dairy Products														
Total milk	48,286	54,655	52,981	[4] 55,260	6,933	7,672	7,926	.....	5,362	4,933	4,961	4,904	4,745	4,805
Cheese	303	546	513	574	56	65	57	58	25	42	46	87	95	93
Evaporated, condensed, and concentrated whole milk	1,009	1,552	1,585	1,599	82	106	118	118	20	58	58	7	28	28
Dried milk	119	382	386	379	12	30	33	33	10	14	18			
Butter	984	759	692	.....	159	150	166	159	194	146	156	169	151	160
Ice cream	1,398	3,820	3,403	.....	65	115	160	159	.....	.....	.....	.....	.....	.....
Wool	192	155	141	127	6	7	5	...	451	441	467	134	163	168
Eggs	2,269	3,459	3,392	3,323	160	249	253	254	94	149	150	23	...	25

[1] Based on crop year August–July. [2] Based on an average of calendar years. [3] Includes rabbit meat. [4] 1949 figure.

TABLE 47.—CHANGES IN NUMBER OF FARMS IN THE UNITED STATES, 1935 TO 1945

Size	Absolute Change (Reduction— Increase+)	Percentage Change (Reduction— Increase+)
	(.....*Number*.....)	(.....*Percentage*.....)
Under 1.2 hectares	+ 63,393	+178
1.2– 3.6 hectares	— 39,663	— 7.4
4– 20 hectares	—469,191	— 22.1
20– 40 hectares	—286,687	— 19.8
40–200 hectares	—251,595	— 10.4
200–400 hectares	+ 6,325	+ 3.8
400 hectares and over	+ 24,237	+ 27.3
TOTA	—953,181	— 14.0

is becoming more and more widespread and seems likely to be a factor which will release additional labor force in the future. Other practices which have helped farmers to increase the efficiency of production have been developed in the recent past. The development of hybrid corn and other improved seed varieties, such as rust-resistant strains of wheat and oats, are factors which have been reflected in the tendencies noted above and which continue every year to exert their influence in increasing agricultural production. Improved strains of animals, especially milk cows, better laying hens, better beef cattle, and more suitable strains of hogs, together with better rations for livestock resulting from increased nutritional knowledge, have contributed their share. Technological advances have also been made in improvement of farming practices such as contour plowing, strip farming, and other practices designed to combat soil erosion.

No large increase in area of farm land is likely to take place in the near future. Of the total 771 million hectares of land in the United States, deserts, cities, parks, roads, railways, forests, and range occupy 309 million hectares. Large areas of the range and forest land are suited only for grazing, and 173 million hectares are used for that purpose. Farms occupy the remaining 462 million hectares, and of this about 67 million hectares are wooded, 170 million hectares are suitable only for use as pasture, and 18 million hectares are occupied by farm buildings, roads, and lanes or are wasteland. On the remaining 207 million hectares, crops and livestock compete for space. Normally about 146 million hectares are put under crops, 45 million are used as pasture, and 16 million are fallow or idle land.

It is estimated that perhaps 75 million hectares of the 207 million now used as cropland are being used only at the cost of considerable depletion from erosion and other causes. Conservation practices will reduce this loss as time goes by, but in the meantime some shrinkage of cultivable land may take place. This loss may be offset by new land brought into cultivation and by irrigation and drainage, but no significant increase of land under cultivation seems likely to occur unless relative prices change sufficiently to make alternative uses more profitable. Since the area of land under crops in 1948 is slightly less than it was in 1920 and since variations in the intervening period have been relatively slight, the possibility of increase in the near future seems remote.

The only major interruption in the trend of ever increasing agricultural production occurred in the mid-1930's and was caused by abnormal weather conditions. The cumulative result of technological advances has been to mitigate the effect of adverse weather conditions by preventing damage to the soil, by rapid planting and harvesting, and by the development of weather- and disease-resistant strains of plants.

The probable degree of permanence which the above-noted trends may have de-

pends, however, also upon the degree of prosperity which the farmer enjoys. Many of the practices which make farm production more efficient involve considerable investment of money, and farmers who are not prosperous cannot undertake it. Since the period 1935-39 the position of the farmer in the United States has improved considerably. The price of farm products has increased from 84 to 120 percent of the level of prices of commodities which farmers have to buy. Farm income per caput has improved from 40 percent of city income in 1935-39 to 60 percent in 1946 and continues to rise.

Crop production in the United States in 1948 now appears almost certain to break several previous records. The harvest of maize, at the presently estimated level of 89.6 million metric tons, will exceed the previous record crop of 1946 by 8 percent. The oats and barley crops exceed those of 1947 by 3.6 million tons, and the wheat crop is second only to the record crop of 1947. Total grain production will be at a record level, and increases above the previous year or new records are indicated for several other crops. A very large supply of feed grains will be produced and this will provide a stimulus for an upturn in livestock production.

Better than average weather conditions account for some part of the bumper crops of 1948—just what part is not easily determined. But of at least equal importance was the general upward trend stimulated by prices favorable to producers, by the technological improvements described earlier, and by increases in the supply of labor, fertilizer, machinery, and other production requisites. With a high level of domestic demand for foodstuffs continuing, consumption may attain new high levels for some commodities, though supplies of meat, dairy products, and eggs will be lower during the latter part of 1948 than during the two previous years.

Stocks of nonperishables are likely to increase from mid-1948 to mid-1949 so that 1949/50 production will be supplemented by larger carry-in stocks than in any previous postwar year.

The Agricultural Act of 1948 extends the present price support provisions to the end of 1949 or until 1949 crops are marketed, and provides that a new price support program with an amended parity price formula shall go into effect in 1950.

The European Recovery Program which got under way during 1948 may be expected to meet the dollar shortage problem in a large measure, as it affects the export of most agricultural products from the United States.

These are all forces operating to continue a high level of production, domestic consumption, and exports.

Canada, Australia, and New Zealand

The other three countries in this group—Canada, Australia, and New Zealand—show many points of similarity. They all have small populations in relation to total area, and all depend upon exporting a large proportion of their agricultural output. They are therefore much more exposed than is the United States to the hazards of fluctuation in international demand for foodstuffs and agricultural raw materials. All three governments have made efforts to protect their farmers from these hazards by negotiating contracts with the United Kingdom and other countries for the provision of agricultural products at specified prices for relatively long periods. In the case of Canada, contracts have been negotiated for the supply of wheat until 1949/50 and for bacon, beef, mutton and lamb, cheese, evaporated and dried milk, eggs, fruits, and flax fiber to the end of 1948. In the case of Australia and New Zealand, bulk purchase agreements with the United Kingdom cover all available supplies of dairy products, eggs, and meat and a large proportion of the Australian wheat crop until the end of 1950.

The governments also have adopted price-support legislation for varying periods. In Canada the Agricultural Prices Support Board has discretionary power to purchase agricultural commodities, and in Australia the Wheat Stabilization Scheme and the Empire Wool Disposal Scheme have protected farmers until 1948. Widespread support through government purchases in New Zealand is given to agricultural prices by the retention of strict control, allocation, and subsidy measures adopted during the war.

Dependence upon exports in the case of these three countries implies also dependence upon imports of other commodities, and all three countries have experienced difficulties in obtaining sufficient imports of farm supplies and implements. In Australia and New Zealand agricultural production actually declined during World War II, principally because of shortage of machines, fertilizers, and other farm supplies. In Canada the most serious difficulties were not felt until late in 1947, when restrictions on imports from the United States were imposed because of dwindling reserves of U.S. dollars. In the immediate future, Canadian imports of farm and industrial machinery as well as of foodstuffs may be restricted by the limited availability either of U.S. dollars or of the commodities needed in countries to which Canada exports.

In all three countries, the area of occupied farms and the area of improved land have increased almost continuously during the whole of the present century. Farm populations also increased until the outbreak of World War II. Yields of field crops have shown a steadily increasing trend in New Zealand, where weather conditions are stable and the soil extremely good. In Canada and Australia, however, extreme variations of weather conditions give rise to such wide fluctuations in yield that any persistent trend is difficult to distinguish.

Mechanization of farming operations is taking place in all three countries, and a tendency toward larger farms and smaller numbers of draft animals has become apparent during the war and postwar years. This trend is more pronounced in Canada than in the other two countries. The number of farm machines in Canada increased throughout the war, and in 1946 it was more than 15 percent higher than in the prewar years. At the same time the use of fertilizers doubled and farming supplies generally were available in relatively large quantities in Canada as compared with the other two countries. In Australia and New Zealand supplies of machines, fertilizers, and other materials are only now beginning to reach prewar volume.

The trade of Australia and New Zealand, both export and import, is largely with Great Britain, following the prewar pattern, but the Canadian situation is different. Before the war the bulk of Canada's exports went to Great Britain and other Empire countries, and the greater part of its imports came from the United States. This trend was increased during the war and immediate postwar years. In 1947, however, shortage of hard currency forced Canada to restrict its imports from the United States and to require that a high proportion of its exports to Great Britain be paid for in hard currency. This requirement, together with other factors, resulted in a certain degree of restriction in exports to the United Kingdom even after taking into consideration amounts which will be made available through purchases under the European Recovery Program. The successful conversion of Canadian war industries to peacetime requirements is helping to tide over this difficult period, and the lifting in August 1948 of restrictions against the export of meat and animals to the United States has a similar effect. These factors, however, are not sufficient to remove the difficulty. The outlook for Canadian exports over a longer period is largely a question of the continuation of foreign demand, which in turn depends upon improvement in the foreign exchange situation.

The pattern of agricultural production in the three countries differs (see Tables 44,

TABLE 48.—NET TRADE IN PRINCIPAL FOOD COMMODITIES IN FOUR COUNTRIES, PREWAR AND POSTWAR

Commodity	United States			Canada			Australia			New Zealand		
	Prewar	1946/47	1947/48	Prewar	1946/47	1947/48	Prewar	1946/47	1947/48	Prewar	1946/47	1947/48
	(*Thousand metric tons*)											
Bread grains [1]	− 488	−10,806	−13,150	−[2] 4,818	− [2] 6,758	− [2] 5,740	− 2,787	− 1,334	− 2,802	+ 39	+ 89	+ 142
Coarse grains [3]	− 43	− 4,078	− 2,119	− [2] 84	− [2] 365	+ [2] 1	− 79	− 50	− 212	+ 11	+ 4	+ 9
Rice (milled)	− 29	− 521	− 581	+ 31	+ 10	+ 20	− 10	− 15	− 18	+ 4	+ 1	+ 1
Sugar (raw value)	+ 2,666	+ 3,352	+ 5,160	+ 425	+ 398	+ 460	− 430	− 154	− 192	+ 79	+ 80	+ 75
Meats	+ 29	− 254	− 83	− 77	− 239	− 178	− 244	− 271	− 258	− 308	− 365	− 358
Fats and oils	+ 38	− 349	+ 79	− 23	+ 11	+ 3	− 121	− 58	− 94	− 167	− 158	− 163
Cheese	+ 25	− 63	− 39	− 36	− 42	− 25	− 12	− 24	− 24	− 85	− 89	− 87
Condensed and evaporated milk	− 13	− 298	−455	− 11	− 30	− 27	−8	− 35	− 35	−10	− 6	− 8
Dried milk	+ 1	− 142		− 2	− 5	− 7		− 9	− 9		− 11	− 13

− Surplus of exports. + Surplus of imports.
[1] Wheat, rye, and flour (grain equivalent). [2] Crop years, August–July. [3] Oats, barley, and maize, including meal and flour (in grain equivalent).

TABLE 49.—PER CAPUT SUPPLIES OF MAJOR FOODSTUFFS IN THE UNITED STATES, CANADA, AUSTRALIA, AND NEW ZEALAND

Country and Period	Cereals and Cereal Products [1]	Roots, Tubers, and Starches	Sugars and Syrups	Pulses and Nuts	Fruits	Vegetables	Fats and Oils	Meat	Eggs	Milk and Cheese	Fish and Shellfish
	(*Kilograms per caput per year at the retail level*)										
United States											
1935–39	89.6	64.2	49.4	7.0	85.4	97.9	22.1	63.9	16.9	161.1	5.1
1946/47	85.5	60.7	52.8	9.4	95.7	114.8	19.8	80.3	18.2	202.6	4.9
1947/48	84.2	58.6	54.9	8.5	96.2	109.8	22.5	74.2	20.7	197.0	5.0
Canada											
1935–39	93.7	88.9	49.2	5.7	36.4	46.8	21.4	61.7	13.8	174.1	5.4
1946/47	91.7	84.4	34.7	8.5	59.4	62.2	18.4	68.9	14.9	232.8	5.3
1947/48	86.4	80.9	41.4	7.0	47.6	51.3	21.2	74.6	16.8	227.2	4.8
Australia											
1936/37–38/39	100.2	48.2	55.2	2.5	74.7	65.0	19.3	120.4	12.0	117.3	5.1
1946/47	101.7	60.0	50.8	3.6	79.4	74.4	16.5	99.9	13.2	140.8	4.0
1947/48	98.3	60.1	52.2	4.2	73.2	74.5	16.4	100.4	13.2	141.6	3.9
New Zealand											
1935–39	92.1	64.0	49.1	0.5	64.4	59.0	18.6	102.0	13.6	131.7	5.4
1947/48	102.9	55.5	43.4	4.1	55.0	62.2	14.0	111.6	13.6	196.3	6.3

[1] Milled basis.

45, and 46). In New Zealand livestock production is by far the most important industry. This is largely conducted on fertile grasslands, natural or improved, and only slightly over one-half million hectares of the total cultivated area of 8 million hectares is used for the production of crops for harvest. Over the past three decades the crop area has declined. As a result, wheat imports have increased until, for the 1947/48 season, about two-thirds of the wheat requirements were imported. The average yield for wheat in New Zealand over the past five years has been about 23.5 quintals per hectare. Most of the import of about 142,000 metric tons has come from Australia, where the average yield has been 7.7 quintals per hectare in the same period.

Australia produces both grain and livestock products and sugar for export. Its 1947/48 wheat crop of 6 million metric tons was a record crop, comparing with an average production of 4 million metric tons in the period 1936/37-1938/39. Barley and oats crops were also large. Sugar and meat production, on the other hand, are still below the prewar level. An effort toward greater diversification in agriculture is being made in Australia, and peanut production is increasing on hitherto undeveloped areas in Queensland. The area planted to peanuts increased from an average of 5,400 hectares in prewar years to 15,700 in 1946 and an estimated 27,000 hectares in 1947. Wool production shows a small increase above prewar years from 451,000 metric tons (greasy basis) in the period 1936/37-1938/39 to 467,000 estimated for 1947/48. Fruit and vegetable production continues at about the prewar level.

In Canada total production of foodstuffs increased during the war years by about 40 percent. During the early years of the war the greatest increase was in animals and animal products. In these years, large quantities of grain were in storage, and shipping space was not sufficient to permit their movement. A considerable demand for livestock products in the United Kingdom and in the armed forces during the war confirmed a trend toward the development of livestock production in the grain-producing areas of Canada, and a considerable area which had previously produced wheat was turned to the production of feed grains. The wheat area declined from over 11.3 million hectares in 1940 to less than 6.9 million hectares in 1943, and the area in oats, barley, buckwheat, and mixed grains increased during the same period. Since 1944, animal numbers—though still above prewar—have declined steadily, and the wheat area has risen to almost its prewar level. In 1948 the area sown to wheat was 9.8 million hectares, and a total crop of 10.1 million metric tons is anticipated. This will exceed last year's production which, because of adverse weather conditions, amounted to only 9.3 million tons. The crop of feed grains also is expected to be substantially larger than the 1947 crop and probably will result in an upturn of the trend in production of livestock. During these years, also, the area in oilseeds expanded substantially and production of flaxseed increased from an average of 38,000 metric tons in 1935-39 to 310,000 in 1947.

Consumption

Food consumption levels in terms of the nutritive value of the average per caput supplies available in the United States were about the same in 1947/48 as in 1946/47, and were substantially above prewar (see Tables 49 and 50). These supplies, if distributed according to need, would be sufficient to provide a diet adequate for health and physical development. Investigations have shown, however, that a considerable proportion of the population obtained less food than the average and that their diet

was unbalanced. This was due in part to inadequate purchasing power and in part to poor food habits.

In Canada the calorie value of the available food supplies was higher in 1947/48 than in 1946/47, when it was approximately the same as in the prewar period. The average consumption of total and animal protein is above prewar levels. Dietary and nutrition studies have shown that there are inequalities of distribution and that malnutrition does exist. The estimated supplies of food available for consumption in Australia and New Zealand were probably much the same in 1947/48 as in 1946/47, being to an extent regulated by restrictive rationing.

It will be seen from Tables 49 and 50 that the diet is characterized by a relatively high proportion of animal food and that the calories obtained from cereals and starchy foods are only about 30 percent of the total.

Various investigations in Australia have shown that in general the population is obtaining supplies of foodstuffs and nutrients, with the exception of calcium, sufficient to ensure a fully satisfactory level of health and physical development. There is, however, an inadequacy of fruits and vegetables in the more outlying regions, brought about by difficulties of distribution.

In this group of countries research in the field of nutrition is relatively active, and investigations into the food consumption levels and nutritional status of various population groups have been carried out from time to time. In New Zealand there have been no nutrition surveys since before the war. In Australia investigations have been made in rural areas in the past two years, following up the nation-wide survey of food consumption levels made during the war. The United States Public Health Service has organized a widespread survey of nutritional status in different parts of the U.S.A., and similar types of surveys are being made in Canada. In both the United

TABLE 50.—NUTRITIVE VALUE OF FOOD SUPPLIES IN THE UNITED STATES, CANADA, AUSTRALIA, AND NEW ZEALAND

Country and Period	Calories		Protein			Fat
	Daily Supply per Caput	Percentage from Cereals and Tubers	Daily Supply per Caput		Animal Protein Related to Total Protein	Daily Supply per Caput
			Total	Animal		
	(*Number*)	(*Percentage*)	(.....*Grams*.....)		(*Percentage*)	(*Grams*)
United States						
1935–39	3,098	32.9	88.2	49.7	56.3	120.9
1946/47	3,337	29.2	101.9	62.8	61.6	137.3
1947/48	3,344	28.6	99.8	61.4	61.5	139.8
Canada						
1935–39	3,037	36.1	85.0	47.5	55.9	118.3
1946/47	3,035	35.6	98.0	58.5	59.7	117.7
1947/48	3,129	32.6	95.2	59.2	62.2	132.1
Australia						
1936/37–38/39	3,396	29.4	102.5	66.0	64.4	128.6
1946/47	3,283	30.9	99.0	60.2	60.8	115.1
1947/48	3,205	30.6	98.8	59.9	60.6	117.7
New Zealand						
1935–39	3,197	31.6	98.5	62.7	63.7	120.8
1947/48	3,258	31.6	112.8	72.5	64.3	121.7

States and Canada the physiological effects of different levels of feeding have been studied in recent years by the medical teams of the armed forces. There is still, however, no agreement as to the most useful criteria and methods of assessing the nutritional status of population groups.

Rationing has ceased altogether in Canada and the United States of America. Australia has recently withdrawn restrictions on nearly all commodities. New Zealand still rations butter, meat, and sugar, and restricts purchases of certain other foods in the effort to supply the United Kingdom with maximum amounts. There is no real shortage of food in any of these countries; but prices, in the United States especially, make it difficult for poorer people to buy the food to provide an adequate diet.

The United States has a federally sponsored school feeding program which supplies meals to about 27 percent of the school population. No school is compelled to serve meals. Canada has no national school feeding program, but an interesting experiment is being made by the Canadian Red Cross in Toronto, where a comprehensive study with accurate controls is being made to determine the advantages of a well-planned and well-executed school-meal scheme. Preliminary results appear favorable.

Neither Australia nor New Zealand has a national school feeding program, although a few State meal schemes exist in Australia. The availability of food supplies in these areas is considered to reduce the necessity for such schemes. In New Zealand the free milk scheme in schools covers 90 percent of the school population.

In all of these countries, popular nutrition education is developing widely. Studies are now being made to assess the relative success of press publicity, radio, lectures, and other teaching methods and media.

Plans and Programs

United States of America

The United States submitted to FAO projections of production and utilization of agricultural products in 1949/50. For a number of the major crops some production declines from the record levels of the past two years are indicated. The area of wheat planted, for example, would fall 6 percent from the 1947 level or approximately back to the 1935-39 average. With average weather conditions, however, it is estimated that production on this area would be about 40 percent higher than prewar because of improvement in normal yields, but this level of production would still be 22 percent below that of 1947.

The area of maize, on the other hand, would increase by 4 percent over that of 1947. With average growing conditions this would result in a crop estimated at 30 percent above the 1935-39 average, but 14 percent below the record crop of 1948. Small increases are projected in the area and production of both barley and oats.

These changes in grain production would represent a return from the emphasis of recent years upon the production of bread grains for export. This would permit some improvement in land utilization from the standpoint of soil conservation and would contribute toward an increase in feed supplies and hence an expansion of livestock production. Some reduction in the area of flaxseed and peanuts is indicated, but the area of soybeans would be maintained at very nearly the 1947 level. This would somewhat reduce total production of vegetable oils. With respect to most other crops, the intention is apparently to adjust production to domestic needs, making allowance for the increase in the population and anticipated changes in consumption

habits. Thus, there would be some increase in the area and production of vegetables generally, with slight decreases for potatoes, beans, and peas.

Such production changes would result in a larger proportion of the total output being consumed within the country. Bread-grain exports would be reduced by more than 5 million tons from the 1947/48 level, although the export of coarse grains would be approximately maintained. The lower area and production of rice projected would also result in reduced exports of rice with normal growing conditions. There would also be a reduction in exports of pulses, edible fats and oils, vegetables, meat, and dairy products. The domestic consumption pattern would represent a reduction from recent levels of meat consumption with compensating increases in consumption of eggs, dairy products, fruits, and vegetables.

The area of cotton would be maintained at approximately the present level, which is well below that of prewar years. Tobacco area would be reduced slightly, though still remaining higher than the prewar average.

These changes in production, trade, and domestic consumption appear to reflect the view that the need or demand for American agricultural products in other regions will not be as great in 1949/50 as it has been during the late war and immediate postwar years and that some retreat from the emphasis on production for export is in order.

It is apparent from the examination of recent production trends and the underlying causes that, under continued favorable economic conditions, the natural expectation would be for agricultural output in the United States to expand still further. Significant shifts in production, as between different commodities, are also possible. Even though the improved world-wide supply position in 1948/49 results in some reduction in prices of the major commodities entering into international trade, the position of the American farmer is supported on the one hand by the high level of purchasing power of domestic consumers and, on the other hand, by legislation extending price supports. The very high level of feed production in 1948 will favor an upturn in livestock production. Large supplies of feedstuffs may cause some lowering of feed prices, and this, together with the high level of domestic demand for livestock products, may result in price ratios which are even more favorable to livestock farmers.

Since production in the United States is not directly controlled by the Government but depends upon the response of individual farmers to economic conditions, it is recognized that changes in either the international or the domestic economic situation may result in departures from the projections made some months ago. In the case of wheat, for example, availabilities for export are likely to be larger in 1948/49 than those indicated for 1949/50. Stated world import requirements for wheat in 1948/49 are in excess of estimated world supplies available for export even though growing conditions have been above average in most parts of the world this year. Should growing conditions in deficit countries be more nearly normal during the period affecting the 1949/50 harvest, the demand upon the United States for exports might well be greater than indicated. With a continued high level of world demand, production in the United States might respond in a way that would provide a larger surplus for export than that indicated.

Canada, Australia, and New Zealand

There remain relatively large areas of undeveloped land in Canada, Australia, and New Zealand which would be suitable for crop production in certain circumstances. Most of this land, however, suffers from disadvantages which make it uneco-

nomical to operate at present. It is either wooded or isolated or requires irrigation. New settlers are opening some of this land each year, and in Australia there are plans to bring comparatively large tracts under cultivation; but the contribution to total production is small so far. Any considerable increase in production in the near future would probably come from increased yields, therefore, rather than from additional area. The use of fertilizer continues to expand; improved varieties of plants have been responsible for greatly increased yields in certain areas and rust-resistant varieties of wheat have been generally adopted; better insecticides and chemical weed killers, together with their more efficient use, will show pronounced results in the future; technological improvements in general are being adopted rapidly in some regions; in others, size of farm and methods of land tenure obstruct the development of modern methods. In the areas most significant from the point of view of export trade, however, improvement is proceeding at the highest rate and, provided marketing arrangements can be maintained or improved, agricultural production can be expected to increase in the foreseeable future.

In New Zealand and Australia, although progress in technology is being made, its effects have been retarded by shortage of labor and supplies. Although the labor situation is being relieved, shortage of fertilizer, machinery, and supplies continues, partly as a result of restrictions on imports from dollar areas. No doubt these two countries will benefit from accruals to the U. K. dollar pool as well as from the stimulus which may be given to manufacturing industries in the United Kingdom by the European Recovery Program. This, however, cannot have an immediate effect and the reports submitted do not indicate any general increase in production for 1949/50. The report submitted by New Zealand visualizes about the same level of production in 1949/50 as at present. A small increase may result from growth of population by immigration, but this is not expected to be significant, partly because the movement is not large and partly because increase in output of livestock products is of slow development at best.

Owing to the record wheat and oats crops of 1947/48, exports of grain from Australia will be high during 1948/49, and it is probable that a larger than average carry-over will augment shipments during the next year. An average crop in 1949/50, therefore, may be expected to result in greater than average exports. Rice exports are expected to remain at about the present level, which, because of both increased production and decreased consumption, is double that of prewar years, or 25,000 metric tons. Owing to greatly increased domestic production, imports of oils and oilseeds are expected to decline substantially to about 50 percent of prewar volume. In view of increased feed supplies, exports of livestock products in 1949/50 may slightly exceed those of 1946/47 and 1947/48. This increase is expected in all types of meats and meat products as well as in poultry and dairy products. Wool production also may increase, with a consequent increase in exports. The extent to which shortages of labor, machinery, and supplies may affect expansion is, of course, not calculable. It is probable that technological improvements, by offsetting the incidence of adverse weather upon Australian crops, will result in a considerable diminution of the usual extreme fluctuations in yields from year to year.

In Canada the situation in respect of labor, machinery, and farm supplies has been better than in Oceania. There is reason to believe that over a relatively long period expansion of production may take place. The degree to which this is likely to be felt by 1949/50, however, is very limited. The detailed 1949/50 projections submitted by Canada indicate that production and exports of bread grains will remain stable at about

10 million metric tons and 6 million tons respectively. Production of feed grains is expected to increase to a point perhaps 20 percent above prewar. Until animal numbers increase to wartime levels, a proportion of the increase in coarse grains will be exported. Although better feed supplies are expected to result in an increase in animal numbers and in production of meat and livestock products, this trend will not be felt substantially in volume of exports by 1949/50. Exports of milk and milk products are expected to remain at their present relatively high level.

Conclusions

The United States of America, Canada, and Australia together accounted for 51 percent of total world exports of bread grains during the prewar period and 83 percent in 1947/48. For coarse grains the corresponding percentages were 2 and 31. The programs for 1949/50 submitted to FAO indicate a reduction of about 4 million tons, or nearly 20 percent, in bread-grain exports from the 1947/48 level, but the reduced level would still be more than double the prewar average. Exports of coarse grains, on the other hand, would be well above the prewar level, but somewhat below the 1947/48 level.

The facts examined elsewhere in this report indicate that in most other regions food production is not expected to increase as rapidly as requirements, if requirements are taken to include provision for population growth, the restoration of prewar levels of consumption, and some measure of improvement over prewar standards in those countries where the need for such improvement is most urgent. This suggests that other regions might be looking to these four great exporting countries for an increased volume of exports during the years immediately ahead.

The impression that emerges from study of the programs of these four countries, however, is that concern over the world market for their agricultural exports is generally resulting in considerable caution in utilizing to the full the resources that could be made available for a continued expansion of production for export. This is not simply a question of the general level of world supplies and prices; it is also a question of the extent to which conditions will be favorable for world expansion of multilateral trade. Most food-importing countries are increasingly dependent upon non-dollar areas or countries with which they can make bilateral trade arrangements for obtaining food supplies. A key question is the extent to which the United States will accept imports of various commodities from other countries, including the three Dominions under consideration here. Only if there is an expansion of such imports, in order to provide dollar exchange for the purchase of the surplus products of United States agriculture, can the great potential contribution of American agriculture to the food supply of the world be realized.

All three Dominions need industrial products from the United States and must sell agricultural products for dollars in order to be in a position to buy them. Canada, for example, would like to sell more meat and live animals in the United States. The Dominions have a problem arising from the fact that they specialize heavily in the production of meat and dairy products for export. Since these are luxury products to most prospective importers other than the United Kingdom, the demand for them is quite limited, and, as is suggested in the section on livestock products, they may move even further out of reach of many deficit countries. Hence, expansion of these products with a view to increased exports is a serious policy question.

A most important question, particularly in the short run, is the extent to which agricultural production policy in these countries will be geared to an international

trade situation that holds so many uncertainties for the future. In all four countries to some extent, and in the United States and Canada to the greatest degree, government policies with respect to production operate only through the mechanism of influencing economic incentives of millions of farmers. These farmers have experienced favorable conditions for a period of several years and, in particular, they have found the production of commodities for export especially profitable. Governments have various types of commitments with respect to the continuance of such conditions. The question arises then as to whether there may not be strong forces for the continuance of a high and even perhaps an increasing level of production of export commodities for the next two or three years at least, and whether the alternatives may not be either a desirable continuance of exports at a high level under generally favorable trade conditions, or, in a less favorable climate, the maintenance of exports under some kind of subsidy arrangements.

Forestry and Forest Products in Canada and the United States

Forestry in this region is in a state of transition. The uncontrolled exploitation of the past is disappearing and great strides are being made towards the development of methods of forest management suitable to American needs. Corresponding improvements in the utilization of forest products are continually being introduced.

In the past two centuries great areas of virgin forests have been removed to make room for agriculture, and additional vast tracts have been logged for the first time. The difficulties encountered in large-scale forest operations have often required very large capital investments, both in logging equipment and in mills, and the desire to recover invested capital as quickly as possible has often led to exploitation of the forest without regard for regeneration of crops for the future. The trend of development has shown marked similarities in Canada and the United States of America, although in the former country title to most of the forest land remains in the hands of the Government, while in the United States private ownership predominates. With certain exceptions, notably in the Douglas Fir region on the West Coast, the virgin forests have largely been replaced by younger stands, and more and more of these are now being placed under sustained-yield management.

The development of forest management in the two countries is of importance to the whole world. The United States is the world's greatest consumer of forest products, and Canada is the greatest exporter. If annual yields in the two countries can safely be increased, even larger quantities can be made available to other regions.

Production

In terms of products actually removed from the forest, production in North America increased from 310 million $m^3(r)$ in 1945 to 352 million $m^3(r)$ in 1946, an increase of 13 percent. In the latter year, 76 percent of the region's output was provided by the United States and 22 percent by Canada. Although complete figures are not available, it is certain that in both countries production was higher in 1947.

The latest complete reappraisal of the forestry situation in the United States describes conditions in the year 1944. It is estimated that total drain in the forests, including fellings and losses from natural causes, totaled 390 million $m^3(r)$ as compared with total growth amounting to 379 million $m^3(r)$. There was, then, a relatively small deficit. It is estimated, however, that introduction of better forest management can eventually increase annual growth to more than 560 million $m^3(r)$.

The foregoing figures apply to growth and drain of all forest products, including both saw logs and smaller material. With respect to saw logs alone, the current situation is highly unsatisfactory since drain is believed to exceed growth by more than 50 percent. Output of sawn lumber increased from 85.9 million $m^3(s)$ in 1946 to 89.7 million $m^3(s)$ in 1947, and may prove to be even greater during the current year.

The latest estimate of growth and drain in the accessible productive forests of Canada show that annual growth amounts to about 95 million $m^3(r)$ and is approximately balanced by fellings and natural losses. This estimate is based on usable volume of wood rather than on total volume. Production of forest products increased rapidly from 1946 to 1947. Output of sawn timber rose from 12 million $m^3(s)$ to 13 million $m^3(s)$. Pulp production increased from 6 million to 6.6 million metric tons, and newsprint rose from 3.8 to 4.1 million tons.

The forest industry in this region is highly mechanized and new methods and equipment are constantly being introduced. On the other hand, the wastage of wood in forest operations has been very great. For example, it is estimated that total waste in exploitation in the United States amounted to 89 million $m^3(r)$ in 1944, representing nearly 25 percent of the total volume of the forests exploited.[1] This immense wastage of wood arises principally from the fact that, up to the present time, markets on which some wood could be sold at a profit or even at the cost of extraction have not existed. From the national point of view, however, wastage is obviously very much too high, and energetic steps are now being taken to devise means for its economical recovery. Such recovery must depend in large part on the development of extremely efficient mechanized methods because wage rates for forestry labor in North America are relatively high.

Exports and Imports

In each of the years 1945 and 1946 North America had a net export of forest products of a volume equivalent to 9 million $m^3(r)$. In the latter year net Canadian exports were equivalent to 31.7 million $m^3(r)$, an increase of more than 3 million $m^3(r)$ over 1945. Net imports into the United States, on the other hand, amounted to 23.1 million $m^3(r)$. Reports for 1947 show that the United States imported 2.1 million metric tons of wood pulp in that year, of which 1.4 million came from Canada.

Consumption

Consumption in North America in 1946 totaled 326 million $m^3(r)$ or about 1,500 kilograms per caput.

The United States accounted for 86 percent of the total consumption, or 281 million $m^3(r)$. This represented an increase of nearly 14 percent over 1945. It is estimated by the United States Forest Service that the consumption requirements of the country are likely to reach about 400 million $m^3(r)$ inside the next decade. The anticipated increase in the consumption of sawn lumber is relatively small, but the demand for pulp products continues to expand at a high rate. Between 1904 and 1945 domestic production of paper increased from 2.5 to 8.5 million tons; from 1912 to 1945 production of paperboard rose from 1 million to more than 9 million tons. Estimates for 1950-55 for the two together are placed at 28 million tons.

[1] Total waste, including that in logging operations and in manufacturing processes, was estimated to be 980,000 metric tons.

Progress

Developments of programs in North America are so numerous that only a few of the main trends can be mentioned. Improvement of the means for preventing, detecting, and extinguishing forest fires continues to require a large share of the energies of all forestry organizations—federal, state, and provincial. New legislation is being adopted by federal and local governments providing for expansion of means for combating the ravages of insect pests. Forest inventories are being conducted through the combined use of aerial and ground survey methods. Research programs in forestry and the utilization of forest products are being revised and expanded. In the United States there is a notable extension of the "tree-farm" program, through which many private industries are applying systematic forest management to their properties. A further significant development is the co-operative sustained-yield unit program under which public and private forest lands are pooled to provide sustained-yield areas capable of supporting dependent industries in perpetuity.

In Canada, Royal Commissions on Forestry have completed their reports in several provinces, and their recommendations are being incorporated in legislation and carried out through administrative action. A conservation board, representing the Dominion and Alberta Governments, has been established on the eastern slopes of the Rocky Mountains in order to protect the flow of the Saskatchewan River which passes through three of the provinces.

In the United States an additional area of 5.4 million hectares was last year brought under organized forest protection, increasing the total to 133 million hectares. Planting surpassed the area of 50,200 hectares reached in 1946, bringing the total reforested area to 2 million hectares. Forest research programs received grants of more than 8.5 million dollars from public and private sources. Systematic forest inventories have now been completed for 14.8 million hectares, or 59 percent of the total forested area. Two more professional schools have been established and the total attendance in all forest schools has now reached a record figure of 8,000.

In Canada air and ground surveys have been continued, aerial survey methods have been improved, and great progress has been made in developing a method using three cameras simultaneously, one taking vertical photographs and the other two obliques. The number of graduates from the forest schools was 91 in 1948 and is expected to reach 378 in the coming year.

Forestry and Forest Products in Oceania

Although there are 50 million hectares of productive forests in the Oceania region, a large proportion of the total area is scattered over a multitude of small islands and can never be of more than local importance. The principal forests belong to Australia (20 million hectares), New Zealand (2 million hectares), and eastern New Guinea. In Australia and New Zealand there has been remarkable development of forestry and forest industries in recent years, although these countries will be net importers of forest products for some time to come.

Production, Trade, and Consumption

The latest figures for Australia and New Zealand show combined fellings of 16 million $m^3(r)$ as compared with an average of 10.5 million $m^3(r)$ for the last 10 years. In addition to fellings, losses from natural causes, especially fires, are high, averaging about 2.1 million $m^3(r)$ annually. The total drain is estimated to be

slightly in excess of total growth, but this estimate is based on presently merchantable species only. The forests are of the heterogeneous type characteristic of the Southern Hemisphere, and in northern Australia there are some stands of the tropical type.

Coniferous forests comprise only 10 percent of the total productive forests, including a large area of plantations of exotic species, but they contribute a substantial share to the total volume of forest production. For example, the volume of sawlogs taken from indigenous forests in New Zealand has remained constant at about 1.2 million $m^3(r)$ annually during the past 20 years, while the volume taken from coniferous plantations has increased from 35,000 $m^3(r)$ to more than 580,000 $m^3(r)$. The increase is, of course, largely caused by the maturing of plantations which were formerly too young to cut, but it illustrates the great possibilities that lie in the introduction of exotic conifers into countries of the Southern Hemisphere.

In the past few years there has been a large increase in the number of sawmills, pulpmills, and plywood plants, especially in Australia. In spite of currency and shipping difficulties, mechanization of logging operations has made progress, and the efficiency of machinery in the mills has been increased. These steps have been necessary because of the lack of manpower, which is a characteristic feature in these countries.

The two countries together were net importers of forest products in 1945 and 1946, imports exceeding exports by a quantity equivalent to 1.2 million—1.3 million $m^3(r)$. Shipments of coniferous lumber from New Zealand to Australia and of broadleaved lumber in the opposite direction are expanding, but the region cannot become entirely self-supporting as far as wood is concerned for some time to come.

Average consumption per caput was estimated to be 970 kilograms in 1946 as compared with only 700 kilograms in 1937. With the rapid development of industrialization, further increases may be expected, especially in Australia, during the next few years.

Progress

Both countries have comprehensive programs for forest development which, in the long run, may enable them to become entirely self-sufficient. Australia is making good progress in building up fire prevention and fire-fighting services, and is expanding its facilities for forest research and for technical training. The modern Forest Products Laboratory in Melbourne is very active in the field of wood technology, but a great deal of investigation must still be undertaken to establish the correct silviculture for the complex indigenous forests.

In New Zealand a thorough survey of all the forest resources is now in progress, using the most up-to-date aerial and ground sampling methods. Working plans are being prepared and revision of forestry legislation is under study.

The progress of reforestation in Australia is being held up to some extent by shortages of manpower. New standardized regulations will lead to important economies in the utilization of wood. Progress has been made in devising means for protection against the ravages of the Lyctus beetle and in the kiln drying of lumber. The number of students enrolled in the Forest Schools of Canberra and Victoria has increased, and a course in silviculture is being offered at Melbourne University.

In New Zealand it has been possible to strengthen regulations for the control of forest fires on the basis of legislation passed last year. This is especially important in the extensive coniferous plantations, where great fire danger regularly occurs at definite seasons. A professional training school is expected to be established during 1949.

PART III

COMMODITY SITUATIONS

Chapter 12

AGRICULTURAL PRODUCTS—FOOD

CEREALS

FOR THE first time since 1939 the bread-grain and feed-grain supply picture for importing countries gives rise to a degree of optimism. This optimism is based upon two general factors: (1) increased domestic production in most importing countries, especially in Europe, and (2) the largest total grain export supply available since 1930-31. As a result importing countries, in addition to increasing to some extent their working stocks which were reduced to very low levels during the past two years, can make definite progress both in improving the quality of bread and in raising ration levels.

Despite the improved supply outlook, however, the stated import requirements of bread grains for 1948/49 still exceed the estimated availability in exporting countries. (See Table 51.)

TABLE 51.—STATED GRAIN IMPORT REQUIREMENTS AND ESTIMATED EXPORT SUPPLIES, 1948/49 [1]

Item	All Grains	Bread Grains	Coarse Grains
	(.....*Million tons*.....)		
Import requirements	42.7	30.8	11.9
Export supply	38.3	25.5	12.8
Difference	−4.4	−5.3	0.9

[1] As of mid-August.

As a result of the deficit created by the continued high level of import requirements, it is still necessary to carry on cereal allocations. Accordingly, the food programs of most countries this season cannot be liberalized to the extent desired, even though important progress is being made. Controls on distribution are being retained by most countries though they have been relaxed and modified in a great many cases. For coarse grains, on the other hand, considerable relaxation in controls is in prospect with less use of the supply for food and more for feed. In turn, some important gains in livestock rehabilitation appear possible.

Review of 1947/48

When the world cereals situation for 1947/48 was considered at the Special Cereals Conference,[1] held in Paris under the sponsorship of FAO in July 1947, the

[1] FAO, *Report on Special Cereals Conference,* Washington, U. S. A., September 1947.

grain deficit problem appeared almost unmanageable. A total deficit of approximately 20 million metric tons was indicated, showing import requirements some 60 percent in excess of the estimated exportable supply. Moreover, most countries submitted requirements on a basis of continued food ration controls throughout the year. The adjustment of supplies and requirements called for some far-reaching measures affecting grain collection and utilization. Though many countries experienced hardships, the prevention of chaos in widespread areas is a testimonial for international collaboration.

In reviewing developments of the past year, several factors appear noteworthy. They include: (1) the increased collection and utilization of indigenous grain production in importing countries; (2) the postponement of livestock rehabilitation programs and extensive use of coarse grain for food; and (3) the very high yields and larger export availability of grain from the Southern Hemisphere countries of Australia and Argentina and some increase in export availability from the United States of America and the Soviet Union. The considerably improved outlook for 1948, evident for many months, also provided encouragement to countries with rigid consumption control measures; under such conditions it was possible for some countries to endure a degree of restriction not even experienced during the war period.

Estimated shipments of bread grains and coarse grains in 1947/48 with comparison for earlier years are shown in Table 52.

It will be noted that total shipments for 1947/48 reached a figure of 35 million metric tons, a substantial increase over exports during the two previous years and the prewar total of 29.4 million tons. Of the total, over 31 million tons, a record figure, was for food purposes. Approximately two-thirds of the coarse-grain movement of 8.4 million tons is estimated to have been used as a substitute for bread grains and about one-third for feed, a considerable part of which was grain unfit or unsuitable for human consumption. With respect to sources, the United States of America, as in each of the two previous years, accounted for the largest share with approximately half the bread-grain total. Canada and Australia shipped about 33 percent of the bread grains, making a total of around 83 percent for these three International Emergency Food Committee member countries. A significant development during the year, however, was the increased movement of all grains from other

TABLE 52.—ESTIMATED NET EXPORTS OF GRAIN BY SOURCES AND TYPES IN 1947/48 WITH COMPARISONS

Period and Type of Grain	Australia	Canada	United States	Argentina	Others [1]	World Total
	(*Thousand metric tons*)					
1935/38 average						
All grains	2,931	4,783	598	10,466	10,650	29,429
Bread grains	2,849	4,731	520	3,058	4,701	15,859
Coarse grains	82	52	78	7,408	5,949	13,569
1945/46						
All grains	1,039	10,889	11,960	3,978	1,118	28,984
Bread grains	1,039	9,929	11,026	2,069	610	24,673
Coarse grains	—	960	934	1,909	508	4,311
1946/47						
All grains	1,388	6,648	15,142	4,322	1,229	28,728
Bread grains	1,336	6,314	10,940	1,734	674	20,998
Coarse grains	52	334	4,202	2,588	555	7,730
1947/48 (Preliminary)						
All grains	3,201	5,750	15,323	7,125	3,604	35,003
Bread grains	2,822	5,750	13,154	3,125	1,720	26,571
Coarse grains	379	0	2,169	4,000	1,884	8,432

[1] Partially estimated.

sources, notably Argentina and the Soviet Union. The increase for coarse grain was particularly marked and it contributed to the larger total movement for the season.

1948/49 Position

Though it is still too early for a detailed statistical analysis of the 1948/49 grain position, certain general observations can already be made. The bread-grain situation is featured by (1) a total world production about 5 percent above last year and about equal to the prewar average; (2) a European harvest some 40 percent more than in 1947, although still less than prewar; (3) a large wheat crop outlook in the four chief exporting countries (United States, Canada, Australia, and Argentina) taken together, although less than last year's phenomenal outturn; (4) continued high import requirements, associated with the desire of deficit countries to relax grain controls and to increase stocks; (5) the continuing large share of the United States in total world exports.

Factors of special significance in the 1948/49 coarse-grains situation are (1) a record world production of coarse grains largely due to the record maize crop in the United States, which could result in a very large export surplus if various internal factors did not limit the quantity likely to be shipped; (2) the location of the bulk of the remaining export supplies in Argentina, the Balkans, and the Soviet Union where special problems of procurement, trade agreements, etc., are affecting shipments; (3) the active interest in livestock rehabilitation to meet demand for meat and milk and to restore or develop a more balanced agricultural economy in importing countries, this being the first postwar year in which it has been possible to recognize an active livestock rehabilitation program.

Statistics of *total* production and requirements do not tell the full story. An important factor in the 1948/49 cereal position, in contrast with that of a year ago, is a substantial increase in the production of the importing countries. Production increases of wheat and rye in Europe alone are likely to amount to nearly 15 million tons. With the increased production in importing countries, together with a continuation of imports at a high level, their total utilization will be at a substantially higher rate (estimated at around 30 percent) than during the difficult year just passed.

Requests for imports of bread grains officially presented by claimant countries to the IEFC Cereals Committee total nearly 31 million tons compared with around 40 million tons a year ago. In connection with the requirements submitted for 1948/49, approximately only half of the increase in bread-grain production in importing countries was scheduled to be collected by governments for use in meeting bread ration programs. This reflects a significant change in the utilization pattern of many countries. It does not mean that the additional production will not be effectively utilized, but it does mean that with expanding production it no longer appears necessary or desirable to maintain rigid collection and utilization controls.

For coarse grains the current season may be regarded as a transition year between food and feed use. The greatly increased bread-grain harvest in many importing countries, particularly Europe, and the estimated large quantities of bread grain available for export, even though below import requests, make it possible for coarse grain to be used to a considerable extent again for feed. At the time of writing, large quantities of maize are available for export from Argentina. At the end of the year the United States bumper crop of maize will become available. For the period July 1948 to June 1949, world exports of coarse grains have been estimated at approxi-

mately 12 to 13 million tons or slightly in excess of stated needs of importing countries for coarse grain for food and feed purposes. Because of the bread-grain deficit and the seasonal character of availablity of coarse-grain supplies, it is again necessary to utilize some additional coarse grain for food. As a result, supplies and import requirements of coarse grains appear to be approximately in balance for the season.

An examination of import requests for 1948/49 clearly shows that most countries are planning substantial increases in food consumption programs. Some claimants no longer ask that hunger or need be regarded as the yardstick for judging requirements, but rather such factors as the effect upon rehabilitation of the economy, the quantity and nature of foreign exchange available for purchase, bilateral trade agreements, the return of coarse-grain use to feed rather than food—in short, a return to more normal consumption patterns. The supply/demand position would appear to justify a considerable modification in previous criteria of allocation, i.e., minimum quantities to maintain food ration needs. In fact, on the basis of continued bread-grain utilization in importing countries at last year's levels, a definite surplus would result.

Moreover, the stated requirements for certain countries are in excess of the quantity of bread grain and coarse grain that would probably be purchased on world markets under present price and procurement conditions, even if no allocations were in effect in 1948/49. It is estimated that 2.5 to 3 million tons of bread grains, or approximately half of the indicated deficit, and at least 1 million tons of stated coarse-grain requirements for feed would not be procured because of price, foreign exchange, or other reasons. As a result, the net total of *effective* bread-grain requirements would appear to be around 28 million tons and of coarse-grain 10.5 to 11 million tons, leaving an *apparent* deficit of 2.5 million tons for bread grains and an indicated surplus of some 2 million tons of coarse grains. An examination of the proposed utilization pattern for many countries would seem to indicate that a substitution of 2 million tons of coarse grains for bread grains could easily be made and would probably interfere least with the general food objectives of most importing countries.

While it appears that the adjustment of supplies and import requests can be brought into a working balance, optimism should be tempered with caution until more information is available. If grain prices decline further, the effective demand may prove higher than postulated above. Furthermore, governments that move too fast and too far in relaxing consumption and collection controls for bread grains might need to reinstate them later in the season to bridge a gap until 1949 crop supplies are available. At the beginning of the 1946/47 season, when optimism was also widespread, some countries removed or liberalized rations and later found reinstatement difficult. Another three or four months should largely clarify such present uncertain factors as Southern Hemisphere harvests, trade agreements or procurement possibilities from non-IEFC sources, and revised requirements brought about by crop changes or other factors.

Future Outlook

Looking beyond 1948/49 the cereal picture, both for bread grains and coarse grains, becomes less definite. The position for any individual year is largely dependent upon weather conditions. It is possible, however, to call attention to a number of factors that seem likely to have a significant effect upon the present world production

and trade pattern, and as a result to understand better the problems ahead and possible courses of action.

With the marked improvement in the world cereal supply position indicated for 1948/49, it is tempting to conclude that the types of grain shortages characteristic of recent years are over, at least for the years immediately ahead. Perhaps such a conclusion is justified, but for the next season or two a cautious approach suggests that both production in the deficit countries and exportable supplies in the surplus countries may recede somewhat. Much of the current year's advance in production is to be ascribed to a favorable season and not entirely to permanent recovery. On this account there is reason to expect smaller crops in many countries, particularly in Europe, that have reported unusually high yields in 1948 though, on the other hand, the improved supply of fertilizer and other requisites should be having good effect.

It should also be remembered that the United States of America, which has been the principal exporter, has harvested unusually large wheat crops in 1948 and preceding years, and is now exporting at a level which lower yields or adjusted farm programs may not permit in the coming years. The record maize crop of 1948 can hardly be expected to be repeated next season. In other exporting areas significantly wide year-to-year fluctuations in the size of crops may be expected. They would exert their main influence on exportable supplies. In some countries developments in government policies could drastically affect the volume of exports. A reduced outturn in 1949/50, especially in importing countries, could check present programs of increasing food and feed utilization.

The general longer-term considerations appear to be (1) sustained and increasing "physical" need for large grain supplies, owing to population growth, desire to rehabilitate and expand livestock, and desire to restore and improve diets; and (2) shortages of hard exchange on the part of importing countries dependent on such exchange sources for their grain supplies. A complicating factor is the wide use of bilateral trade agreements, which are being resorted to as a means of counteracting exchange shortages but which introduce an element of rigidity into the grain trade.

A brief glance at the world pattern of grain production and trade that has emerged since the war will help to illustrate the present problem. Table 53, summarizing world grain production, shows the war-induced decline of production in Europe and Asia being gradually surmounted. For Europe, the gap to be bridged is still substantial; for Asia, the prewar level of production has been restored but a continuing rice deficit and a substantial growth of population underline the need for further progress. In North America there has been a spectacular increase in grain production, and in South America some expansion has taken place though it is probably not proportionate to the growth of demand. In Oceania seasonal fluctuations render it difficult to determine whether the trend is decisively upwards.

Table 54, summarizing world trade in prewar and recent years, shows a material increase in the total imports of bread grain in the postwar years and a reduction in coarse-grain imports. As noted earlier, there are good prospects of recovery in coarse-grain imports in 1948/49. Of great consequence to importing countries is the change in the proportions of their supplies coming from the various exporters. Whereas before the war imports were obtained from widely separated sources, there has been in each postwar year a growing dependence on the four major exporters. The minor exporters, which, as a group, provided as much as one-third of the prewar trade, now supply a much reduced proportion. In particular there has been a growing dependence

TABLE 53.—WORLD GRAIN PRODUCTION BY CONTINENTS [1]

Continent	1934-38			1945			1946			1947		
	Wheat and Rye	Barley, Oats, and Maize	Total	Wheat and Rye	Barley. Oats, and Maize	Total	Wheat and Rye	Barley, Oats, and Maize	Total	Wheat and Rye	Barley, Oats, and Maize	Total
	(*Million metric tons*)											
Europe [2]	61.5	54.8	116.3	35.0	34.7	69.7	44.9	39.0	83.9	35.4	43.1	78.5
North and Central America	28.2	81.3	109.5	39.9	114.3	154.2	43.7	122.8	166.5	47.9	96.3	144.2
South America	8.4	15.5	23.9	5.8	13.2	19.0	7.8	16.0	23.8	8.7	15.7	24.4
Asia	40.2	32.5	72.7	39.6	31.4	71.0	41.4	33.1	74.5	39.6	32.7	72.3
Africa	3.7	8.2	11.9	2.3	6.1	8.4	3.6	7.2	10.8	3.3	8.5	11.8
Oceania	4.4	0.8	5.2	4.0	1.0	5.0	3.3	0.9	4.2	6.4	1.2	7.6
TOTAL [1]	146.4	193.1	339.5	126.6	200.7	327.3	144.7	219.0	363.7	141.3	197.5	338.8

[1] Excluding U.S.S.R. and based on official estimates wherever available.
[2] All figures relate to present territories.

TABLE 54.—GROSS IMPORTS OF GRAIN BY CONTINENTS [1]

Continent	1934–38			1945/46			1946/47			1947/48		
	Wheat and Rye	Barley, Oats, and Maize	Total	Wheat and Rye	Barley, Oats, and Maize	Total	Wheat and Rye	Barley, Oats, and Maize	Total	Wheat and Rye	Coarse Grains	Total
	(*Million metric tons*)											
Europe	12.7	11.7	24.4	17.3	2.9	20.9	13.8	5.1	18.9	19.4	6.5	25.9
North and Central America	0.5	1.4	1.9	0.8	0.3	1.1	1.0	0.1	1.1	1.0	0.2	1.2
South America	1.3	—	1.3	1.2	0.1	1.3	1.7	0.4	2.1	1.4	0.3	1.7
Asia	1.8	0.3	2.1	3.2	0.3	3.5	3.7	1.8	5.5	3.6	1.3	4.9
Africa	0.5	0.2	0.7	2.0	0.7	2.7	0.7	0.5	1.2	1.1	0.2	1.3
Oceania	0.1	—	0.1	0.2	—	0.2	0.1	—	0.1	0.1	—	0.1
TOTAL	16.9	13.6	30.5	24.7	4.3	29.0	21.0	7.9	28.9	26.6	8.5	35.1

[1] Based partly on shipment data and partly on official estimates of imports except for prewar figures which have been compiled from official import returns.

upon North American supplies which in 1948/49 appear likely to account for some 60 percent of the total grain movement.

This increased reliance on one geographical region greatly accentuates the exchange problem of the importing countries and makes world supplies more exposed to seasonal fluctuations. With the inclusion of Argentina, at least 80 percent of current grain exportable supplies may be regarded as requiring hard currency.

Over the next few years, some further increase in production may be expected in Europe and possibly Asia. Current European production plans envisage the almost complete restoration of prewar grain production levels by 1950/51, conditional, however, on progress in other fields. Some growth in population and a continuation of the present emphasis on cereals as opposed to livestock products in the diet will leave Europe in need of permanently larger bread-grain imports than those of prewar years. In Asia, much depends on the progress of the rice crops. The rice shortage and population growth may be expected for some years to maintain Asia's greatly increased need for wheat and coarse grain. It is clear that for some years the food-grain requirements of Asia and Europe together will be significantly larger than prewar, though probably not as high as in the current year.

The outlook for the principal exporters is difficult to assess. Table 55 shows what has happened to wheat before and after World War II as compared with the effect of World War I. In World War I the area expanded enormously in what are now the four big exporting countries, while yields changed little. In World War II the area sown actually declined somewhat, while yields rose prominently; the increase in output was over 40 percent compared with 30 percent after the previous war. The comparison for World War II is based on the drought-affected period of the 1930's, but the increase in output is also quite significant if the years 1926-30 are taken as the basis of comparison.

TABLE 55.—WHEAT IN TWO WORLD WARS—FOUR MAJOR EXPORTERS: ARGENTINA, AUSTRALIA, CANADA, AND THE UNITED STATES

Period	Area		Yield		Production
	Sown	Harvested	Sown	Harvested	
	(*Million hectares*)		(*Quintals per hectare*)		(*Million metric tons*)
World War I					
1909–13	34.6	32.6	8.8	9.3	30.4
1919–22	46.6	44.4	8.5	8.9	39.5
1926–30	50.9	47.8	9.1	9.7	46.5
World War II					
1934–38	52.8	44.6	7.1	8.4	37.5
1945–48	50.1	48.0	10.6	11.1	53.1
1952–56	?	?	?	?	?

It is notable that production expanded further and substantially after 1922. Will history repeat itself or are production and exports likely to decline? To a large extent, the answer depends on what happens in the United States, where the largest fluctuations can occur. As already noted, weather conditions have been favorable for an abnormal number of years. Some marginal lands in that country are programmed to go out of cultivation soon, though that is difficult of accomplishment

while prices remain high. On the other hand, United States farmers are using greatly improved varieties of seed[2] which are more resistant to diseases; they are using two and one-half times as much fertilizer as prewar and have adopted other improved farm practices and it may be that the yields which now seem high will rise still further.

Argentina, on the assumption of changes in its economy in the direction of greater industrialization and further utilization of crops to feed to its livestock, would be expected to export cereals on a somewhat smaller scale than before the war. No large changes are anticipated at present in the export supplies of the other two major exporters. The countries of southeastern Europe may be expected to continue the recovery in their exports begun in 1947/48. Whether this latter expansion will continue up to the prewar level and beyond is problematical. The production plans of the countries included in this group envisage smaller total grain exports than before the war. Land reforms, population increases, and programs for better domestic nutrition are the main factors that point to this result. On the other hand, political policies and the need for imports of industrial goods may lead to a development of East-West trade and a consequently greater export of grain than is now envisaged. Despite these uncertainties, it may be expected that world grain exports in future years will be somewhat below present high levels but well above the prewar average.

Prospects for coarse grains, however, are even more uncertain and developments in these may react on the bread-grain prospects. The exportable surpluses may vary widely as they have in the past; maize and the other coarse grains are subject to great seasonal fluctuations. On the other hand, the demand for coarse-grain imports will depend very largely on the developments in the over-all economic situation, particularly its exchange aspect, and on the decisions to be made by governments of both importing and exporting countries regarding their livestock policies and food consumption progress.

There would seem to be little question regarding the ability of countries to consume grain export surpluses for food and feed if satisfactory means of payment or trade could be arranged. International commodity agreements for wheat and possibly also for coarse grains could do much to help develop production and trade programs on a more orderly and stable basis that would minimize many present uncertainties. In the absence of such commodity arrangements, however, it may be useful to consider the maintenance of the existing international collaboration activities for the purpose of developing a co-ordinated approach to future problems of production and trade as well as those of allocation of short supplies.

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[2] *The Annual Report of the U. S. Government to FAO for 1948* contains the following observations: "Improved varieties were partly responsible for the record wheat crop of 1947. Practically the entire acreage in the northern Great Plains was planted to Rival, Mida, Pilot, Thatcher, Newthatch, Stewart, and Carlton, all productive of excellent quality, and highly resistant to stem rust. All were either unknown or hardly known 10 years ago. Kansas produced 21 percent of the wheat crop last year. Forty-three percent of the Kansas acreage was planted to three outstanding varieties—Pawnee, Comanche, and Wichita—which have been developed within the past five years. These three varieties were also grown on increased acreages in other Southern Great Plains States and accounted in part for the high yields in Oklahoma and Colorado."

RICE

Current Situation

Rice production in 1947/48 was higher than in the past few years, especially in China, Indonesia, Burma, Siam, and Egypt. Total world production recovered almost to prewar levels (see Table 56) but this was caused largely by continued expansion in the lesser producing areas—Egypt and the Western Hemisphere—while production in Asia still had not regained prewar levels. The slaughter of draft animals, lack of consumer goods, dislocation of markets, and the incomplete restoration of transport facilities and irrigation systems have all contributed to retarding recovery in output. Moreover, there seemed definite indications of a decline in yields per hectare although the statistics are neither complete nor always reliable.

TABLE 56.—ESTIMATED WORLD AREA AND PRODUCTION (MILLED EQUIVALENT) OF RICE, PREWAR, 1946/47, AND 1947/48

Region	Area			Production		
	1934/35–1938/39	1946/47	1947/48	1934/35–1938/39	1946/47	1947/48
	(*Thousand hectares*)			(*Thousand metric tons*)		
Asia	78,000	76,000	77,800	96,880	90,545	93,380
Europe	230	210	235	708	494	647
Africa	1,580	2,270	2,300	1,294	1,807	2,028
Oceania			20			49
North and Central America	540	890	990	754	1,202	1,332
South America	1,190	2,140	2,150	1,176	2,340	2,112
TOTAL	81,540	81,510	83,495	100,812	96,388	99,547

In Asia, where more than 90 percent of the world's rice is produced and consumed, the current outlook for the region as a whole is for a continued recovery in production. The indicated rate of increase, however, is by no means enough to keep pace with rising consumption requirements; furthermore, it is being impeded by currency exchange difficulties and in some areas by political unrest.

The pattern of international trade in rice which was broken up by the war is not yet resuming its normal features (see Table 57). Despite the remarkable recovery during the past year in the exports of Burma and Siam, the total exports of Asia remain less than one-third of prewar, primarily because of the much reduced availabilities in Indo-China, Taiwan, and Korea. Meanwhile, the United States of America, Brazil, Egypt, and Ecuador have become significant exporters and not only supply rice-eating peoples outside Asia but also send considerable quantities into Asia.

This situation has had three consequences. First, the deficit countries of Asia have had to import large quantities of other cereals. Second, they have had to pay high prices for rice imports from the Western Hemisphere. Lately, however, there has been a narrowing in the differential between Western Hemisphere and Asian rice prices. The former have tended to soften somewhat while the latter have risen.

Third, the importing countries have been faced with difficulties of payment which have become accentuated in recent months and may be even more serious during the coming year. Rice is still under international allocation recommendation by the International Emergency Food Committee; but the IEFC's Rice Committee has experienced

TABLE 57.—INTERNATIONAL TRADE IN RICE (MILLED BASIS), 1934–38, 1947, AND RECOMMENDED ALLOCATIONS FOR 1948

Region	1934–38		1947 [1]		IEFC Allocation Recommendations 1948	
	Exports	Imports	Exports	Imports	Exports	Imports
	(*Thousand metric tons*)					
Asia	8,655	6,715	1,280	1,645	2,506	2,892
Europe	295	1,439	0	48	10	177
Africa	116	400	198	70	329	210
Oceania	13	76	17	7	18	5
Western Hemisphere	212	532	739	459	701	280
Not specified	—	129	—	5	—	—
TOTAL	9,291	9,291	2,234	2,234	3,564	3,564

[1] Preliminary and incomplete; compiled from reports to the International Emergency Food Committee (IEFC).

increasing difficulties in developing mutually acceptable distribution patterns, since exporting countries have tended to impose conditions with regard to finances and the supply of exchange goods. The difficulties of importing countries in obtaining rice from Western Hemisphere and other dollar areas have increased. Even more significant is the increasing tendency of the major rice-exporting countries of Southeast Asia to emphasize certain financial conditions, especially requiring payment in dollars. Increasingly, the major rice-exporting countries have insisted on sending supplies to countries able to pay in dollars or with essential goods, thus departing, at least to some extent, from the criteria of need. Unless exchange goods are available or long-term financial arrangements are developed, the difficulties of rice-importing countries will increase steadily, and ever larger portions of the total exportable supplies will be diverted to other countries in which rice does not constitute the staff of life.

The level of consumption of the principal rice-eating peoples has shown very little improvement over the previous year. Certain deficit countries have maintained rice rationing and, while the quantity distributed varies from time to time according to the spot supply situation, it has generally been insufficient to maintain the health and working efficiency of the people.

Future Outlook

The world's premier rice problem is to increase production so as to (1) restore per caput consumption to a more satisfactory level; (2) keep pace with the increase in population; and (3) permit of an improvement in diets above prewar levels.

Studies made in the spring of 1948 by representatives of 19 governments that met at Baguio, Philippines, indicated that world production of rice could be increased by 5.7 million metric tons over the 1947/48 level by 1950/51 through a co-ordinated effort to relieve some of the difficulties presently faced by rice growers.[3] This increase in output would result from an increase of 3.4 million hectares or 4.5 percent in the harvested area and 2.5 percent in average yields. Of the world total increase of 5.7 million metric tons, 5.3 million tons would be accounted for by Asia and 0.4 million tons by other

[3] FAO, *Report of the Rice Meeting,* Washington, U.S.A., June 1948.

parts of the world. In order to accomplish this increase in production the information assembled indicated that six major rice-producing countries of Asia would want to import during the three-year period 1948-50, 1.7 million metric tons (product weight) of fertilizers, mainly ammonium sulphate, as well as over 3,000 tractors, 10,000 irrigation pumps and engines, nearly 6,000 pumping plants for percolation wells, and nearly 1 million meters of pipe for reboring surface percolation wells. In addition, it was pointed out that progress would have to be made in improving health conditions, reducing animal diseases, furnishing rice growers with many types of consumer goods, and providing technical assistance to governments interested in increasing rice supplies.

Even if these production targets are completely achieved, are they high enough? The rice-eating population of the world is increasing at the rate of something like 10 million per annum, requiring some 1.3 million tons of additional rice each year. Present consumption levels in most of the countries in which rice is a major part of the diet are below prewar levels. Japan's former imports of 2 million tons will some day have to be resumed at least in part. European countries, which have been almost without rice for several years, are most desirous of returning rice to its customary place in the food supply. In view of these considerations it would seem that the target of 5.7 million extra tons by 1950/51 is not high enough even to restore consumption to prewar levels and feed the additional mouths, and hence that there is no possibility of improving on prewar dietary standards.

Nutritionally desirable levels of consumption were estimated at Baguio, and the production plans for 1950 still leave a deficit of 13.6 million tons in relation to these levels. If the present position is to be improved, governments will need to do everything within their power, not only to implement the programs considered at Baguio, but also to find additional means of reducing losses and adding to rice supplies. To initiate an adequate program of rice expansion will entail action on many fronts, including stimulating of further research, persuading more farmers to adopt improved practices, providing appropriate economic incentives, and developing more adequate health and other services which can contribute to rural welfare.

Since the war, rice production and exports have been expanded in the Western Hemisphere and Africa. Asia has been the destination of the increased net exports. Already payment difficulties have begun to handicap this trade, and production plans of the non-Asiatic countries indicate considerable caution regarding further expansion of production and exports, despite the Baguio meeting's conclusion that Asia's needs for much more rice than is likely to be produced in the region will continue at least until 1950. The non-Asiatic countries submitting production targets at Baguio indicated an increase in production from 3.2 million metric tons in 1947/48 to 3.6 million tons in 1950/51. Indicated exports from these countries would increase from 0.7 million metric tons in 1948 to 1.1 million tons in 1950. But the plans of the United States indicate a reduction in both production and exports, and some of the Latin-American countries are not pushing plans for expanding rice production as rapidly as they might were market prospects firmer.

The immediate question is: How can the rice-deficit countries of Asia obtain currencies acceptable to the non-Asiatic rice-exporting countries? Behind this question is one more basic: Will the countries of Asia find it to their economic advantage to export other commodities in exchange for rice at the exchange ratios that may be expected to prevail? It may be that despite its needs for more rice Asia will choose to limit itself to what it can produce and save its foreign exchange resources for the purchase of other commodities in which it has less relative production advantages. At any rate, this is a

matter in which exchange of information regarding plans is clearly in order. Only in this way can production and trade in rice between regions be geared together in the most economical manner.

FATS AND OILS

Production and Trade

Such statistical evidence as is available indicates that the total world production of fats and oils is estimated to have recovered during 1948 to approximately 100 percent of the average output for the years immediately prior to the war. The estimates include production of fats and oils for use as such from all origins—oilseeds, butter, slaughter fats, and whale and fish oil. During the war and immediately after, world production of all fats and oils had dropped about 10 percent below prewar. For some countries available data are extremely scanty. If the comparison is confined to supplies for which reasonably firm data are available, the decline from prewar production levels was apparently greater than for the world as a whole.

It will be noted (Table 58) that in North America and the Philippine Republic production levels are materially higher than before the war, and that in Europe, Japan, Indonesia, and Malaya there have been substantial declines. The European decline is entirely in butter and animal fats (western and central Europe) since the production of oilseeds and olive oil is, if anything, above prewar levels. Whaling operations are now limited under the Whaling Convention at what is considered to be the appropriate conservation level.

Under prewar conditions 25 percent of the world production of fats and oils was exported—a much higher proportion than was the case for most other primary foods. Although many areas are still preponderantly on an export basis, there has been a significant trend in the case of a number of major exporting areas towards a higher domestic retention of available fats supplies. Since in most of these instances there has not been a corresponding rise in production, the net result has been a considerable reduction in the supply available for international trade. It is early to predict future tendencies, even for 1949, in respect of production and local retention, but the trend of exports under postwar conditions is appraised in Table 59.

The principal importing regions are Europe and North America, which together in the 1934-38 period took almost 90 percent of the primary fat material entering world trade, a similar percentage in 1947, and again in 1948, as judged by the preliminary (August 1948) international allocations. Under prewar conditions Japan was also a large importer; postwar imports, however, have been on a much reduced scale, although a considerable increase is programmed under 1948 allocations. In the case both of the United States of America and of Canada, following the large expansion in the production of vegetable and animal fats during and since the war, there has been a noteworthy increase in exports of indigenous fats and a decrease in imports, with the result that both these countries show a much smaller net import position as compared with

TABLE 58.—WORLD PRODUCTION OF FATS AND OILS: BUTTER, OILSEEDS, AND ALL VISIBLE FATS AND OILS IN TERMS OF OIL EQUIVALENT

Source	Prewar (1934–38)	1948/49 (Crop year)	
	(*Thousand metric tons*)		(*Percentage of prewar*)
Whaling (all areas)	530	330	62
Europe			
North and Western Europe (incl. Iceland)	1,246	980	79
Central Europe (Germany, Austria, Czechoslovakia and Poland)	1,368	702	51
South and Eastern Europe	1,627	1,665	103
U. S. S. R.	2,230	2,100	94
North America (excl. Mexico)	3,326	5,210	157
Central and South America (incl. Mexico)			
Argentina and Uruguay	905	880	97
Others	744	928	125
Africa			
West and East Africa	1,750	1,780	102
North Africa and South Africa	315	280	89
Asia			
China/Manchuria	3,100	4,900	90
India/Pakistan	2,360		
Japan	325	185	57
Indonesia/Malaya	1,190	900	76
Philippines	465	620	133
Others	1,060	1,150	108
Oceania			
Australia and New Zealand	455	440	98
Others	200	125	63
TOTAL (rounded) AND AVERAGE	23,200	23,200	100

TABLE 59.—WORLD EXPORT SUPPLIES OF INDIGENOUS MATERIAL, PREWAR AND POSTWAR (Oilseeds, Butter, and All Visible Fats and Oils)

Source	Actual Shipments				Forecast of Export Supply	
	1934–38	1945 (Calendar year basis)	1946 (Calendar year basis)	1947 (Calendar year basis)	1948/49 (Crop year basis)	1951/52 (Crop year basis)
	(*Thousand metric tons in oil equivalent*)					
Whaling (production)	530	65	145	340	330	650–700
Europe (incl. Iceland and U.S.S.R.)	520	110	120	120	250	
North America (excluding Mexico)	150	410	340	435	530	800–900
Latin America	755	480	445	520	600	
Africa and Near East	1,050	675	760	725	950	1,100
India	515	140	80	90	280	400–500
China/Manchuria	660	[1]	40	115		
Philippines	355	3	375	645	500	500
Indonesia/Malaya/Siam	740	[1]	45	155	460	650–700
Other areas (including Australia and New Zealand)	625	337	310	355	420	500
TOTAL (rounded)	5,900	2,220	[2] 2,660	[2] 3,500	[2] 4,300	4,700–4,800

[1] No data are available, but movement is believed to have been negligible.

[2] Exclusive of shipments by private individuals and relief organizations in parcels not covered by Customs reports. In 1947 these are variously estimated between 50,000 and 100,000 metric tons of fat, mainly from U. S. A.

prewar. It is in Europe, which under prewar conditions accounted for 70 percent of the world imports of fats, representing 45 percent of its consumption, that the effects of the postwar world fats shortage are felt most heavily. (See Table 60.)

During the war, not only was most of Continental Europe deprived of all imported supplies, but the indigenous production of butter and other animal fats steadily declined with the curtailment of supplies of imported feeds. This was offset to only a limited extent by the expansion of oilseeds production, always a risky undertaking under European climatic conditions. The crop year 1947/48 witnessed a notable recovery in olive-oil production throughout the Mediterranean countries and a substantial improvement in over-all fats production in the Danubian area. In central and northwestern Europe, however, production was still greatly below prewar on account of the bad fodder conditions and of the priority claims on agricultural resources of crops for direct consumption rather than for livestock feeding.

For the 1948/49 crop year it is anticipated that most if not all of the European countries will show a notable improvement in the indigenous production of fats and oils. It would appear that the production of visible fats during 1948/49 will attain 80 percent of the prewar level in northwestern Europe as a whole but that in Germany, Poland, and the rest of central Europe it is unlikely to exceed 50 percent.[4] In southern and eastern Europe production has probably regained the prewar level, although there is considerably more vegetable oil and less butter and slaughter fats.

In actual tonnage the shortage of indigenous supplies in central and western Europe has probably been even greater than the shortage of imported supplies, and the combined shortage has fallen with maximum severity upon the industrial or non-farm populations.

1948/49 Supply Prospects

As appraised in Table 59, world export supplies in 1948/49 seem likely to be 0.8 million metric tons above the total movement in the calendar year 1947, and although no allocations have yet been developed for this period it can be safely assumed that a considerable part of this increased tonnage will be obtained by Europe. In general, it seems reasonable to anticipate that, with the exception of Germany, the European fats-importing countries will obtain substantially increased supplies both from imports and domestic production, and that for the crop year 1948/49 the total supply per caput will attain between 80 and 90 percent of prewar levels as compared with 65 to 75 percent in 1947. In the case of Germany, there will probably be a further increase in imports, largely conditioned by the extent to which a larger proportion of available financial resources is appropriated for what is a relatively expensive import item.

In North and Latin America it is also anticipated that there will be a further increase in imports, although not a return to prewar levels. Some Latin-American countries actually obtained increased supplies during the war—largely from Argentina—but with the resumed flow of supplies to Europe under postwar conditions imports into most of Latin America have been diminishing and in general are now below the relatively small prewar volume.

A desire to increase imports obtains in the Union of South Africa, French North Africa, and in the Near East, where the supplies received under postwar conditions

[4] These figures relate only to products of indigenous agriculture and coastal fisheries and exclude whale oil produced by European expeditions in the Antarctic, etc.

have not kept pace with increases in population, purchasing power, and general rate of industrialization.

However hazardous may be the attempt, it is useful at this juncture to appraise the trend of import distribution through the present crop year, and in Table 60 a forecast is made of the likely range of imports in 1948/49 (assuming a world export supply of 4.3 million metric tons) compared with the movement in the calendar years 1945 to 1947 and the prewar (1934-38) average.

TABLE 60.—SHIPMENTS OF OILSEEDS, BUTTER, AND ALL VISIBLE FATS AND OILS TO RECIPIENT AREAS, PREWAR AND POSTWAR

Destination	Actual Movement by Calendar Years				Forecast 1948/49 (July-June)
	1934–38	1945	1946	1947	
	(.....*Thousand metric tons in oil equivalent*.....)				
United Kingdom and Northwest Europe (excluding Germany)	2,520	...	1,520	2,085	2250/2350
Central Europe (including Poland)	1,335	(Analysis	85	175	450/500
Other Europe (including U.S.S.R.)	295	incomplete)	115	130	200
SUBTOTAL (Europe and U.S.S.R.)	4,150	1,460	1,720	2,390	2950/3050
North America (excluding Mexico)	1,045	490	525	680	650/700
Latin America	150	105	155	125	150/175
Africa and Near East	165	85	125	175	200
Japan	170	...	10	20	80/100
Other Asia and Oceania (including Australia and New Zealand)	220	90	115	110	150
WORLD TOTAL [1]	5,900	2,230	2,650	3,500	4,300

[1] Exclusive of quantities re-exported, with or without processing, and also exclusive of voluntary relief parcels and military relief feeding.

The estimated imports shown in this table, together with indigenous production, would result in a widely divergent range of consumption in many countries as compared with prewar. In terms of total supply of fats per person (for edible and industrial usage), consumption would range within Europe from about 100 percent of prewar in the relatively self-sufficient areas of the Mediterranean and the Balkans to 80-90 percent in most of Northwest Europe, with the level in Germany probably below 50 percent. The supply estimated for North America would be equivalent to 95-100 percent of the prewar level, while in Central and South America there would be a very wide range with some countries above rather than below 100 percent of the very low prewar levels.

Future Outlook

Even with the anticipated increase in export supplies during 1948/49, and assuming a substantial recovery in indigenous production in the importing countries, it is clear that there will still be an appreciable fats deficit. The brunt of the shortage will continue to fall on the major importing areas, most heavily on Germany and Japan and to a lesser extent on western Europe. Under present financial conditions, Germany and Japan provide a cushion for the impact of the world fats shortage on the other importing countries, but this position is likely to change gradually. The European importing countries thus face the prospect of a continuing, though much less severe, shortage than that which has existed during and since the war. It should be recognized, however, that effective demand will not necessarily be as large as requirements measured in terms of prewar per

caput consumption. On the purely statistical basis, the supplies assumed as being available to Europe in 1948/49 would be over 2 million tons short of prewar consumption levels. Even if such a supply were available, it is highly unlikely that any large proportion could be financed by the importing countries under present price and currency conditions. On the other hand, it may well be that the supplies assumed (see Table 60) as being available to the non-European importing countries may be below the effective demand of those countries.

It seems reasonable to anticipate further recovery in supplies over the next few years, both from exporting countries and from agriculture in the importing countries. On the present provisional indications world export supplies by 1951/52 may total between 4.5 and 5 million metric tons. They will probably be nearer the higher figure if production is maintained in the United States, if further rehabilitation is accomplished in colonial areas, if more normal conditions are achieved in Manchuria, and if such new projects as that begun in British East Africa go forward according to schedule. Supply prospects for high-protein feed indicate that butter production in Europe, taken as a whole, may not have recovered to the prewar level even by 1951/52.

There seems no reason to believe that world supplies of fats available over the next few years will be sufficient both to cover the increasing requirements of the local populations in the exporting areas and to restore consumption in the importing areas to prewar levels.

Either the majority of the importing countries, taken as a whole, must accustom themselves to a permanent reduction from their prewar standards, or much greater efforts to expand fat production must be made than have yet been contemplated. The outlook is further obscured by the abnormal price relationships and terms of trade which have been developed since the war. The price levels of fats and oils vary widely from country to country, even for the same type of oil. In the United States, market prices during 1948 have been 250 to 300 percent of the 1935-39 level, whereas in those markets which are the most fully subject to world scarcity demand—e.g., Philippine copra and Norwegian whale oil—the price is five to six times the prewar level.

Although some exporting countries report that the prices of other goods and general costs of production are also five to six times the prewar level, it appears that in general the prices now being paid to producers of fats and oils are 50 to 100 percent above the corresponding level of consumer and general industrial goods and services. This reflects the fact that the world scarcity in fats is more severe than in most other commodities. In view of the future outlook this position can be expected to change only gradually.

The situation should, however, be viewed against the historical trends in world supply and demand. It should be recalled that (1) although total world export supplies averaged 5.9 million metric tons in 1934-38, they were only 3.2 million tons in 1913 and 2.8 million tons in 1909; and (2) the per caput utilization of fats and oils for all purposes appears to have increased between 1909-13 and 1934-38 by about 25 percent in North America, the United Kingdom, Germany, Denmark, and probably in the rest of Northwest Europe. Part of this increase in supply came from greater livestock production, but in the main it was provided by the development of tropical and primary sources of supply (oilseeds and whale oil). Nevertheless, the 1934-38 period cannot be regarded as a norm to which countries generally can expect to return, particularly those whose high fat-consumption standards were based on imports of relatively cheap primary fats and oils.

An attempt is made in Table 61 to analyze prewar world production and distribution

of visible fats and oils, grouped according to the apparent range of per caput consumption in the 1934-38 period. This suggests that if the United States is excluded, the importing countries with high or relatively high fat consumption relied on imports to the extent of 55 percent. The United States normally had a much smaller dependence on imports. Of the countries contributing net exports, 75 percent was provided from those with a consumption below 9 kilograms per person, most of the balance coming from countries with a specialized or mechanized agriculture. It would also appear that, taking all countries with a consumption level above 15 kilograms, some 22 percent of the world's population utilized over 50 percent of the total production of fats, whereas in the low-standard countries—below 9 kilograms—over 65 percent of the world's population consumed only 36 percent of the total production.

From the foregoing considerations, the following would appear to be the outlook:

(1) Total supplies likely to be available to those high-standard consumption countries which are heavily dependent on imports will be 10 to 20 percent below prewar per caput consumption.

(2) Prices of fats in international competitive markets will remain considerably above the price level of most other commodities.

(3) Such price prospects should stimulate not only recovery in export production in existing supply areas but also the development of new sources of supply, both in the short term and the longer term.

(4) Such supplies will probably be on a relatively high cost-of-production basis, this applying not only to fats produced through livestock but also to oilseeds in many areas.

TABLE 61.—PREWAR WORLD SUPPLIES AND DISTRIBUTION OF VISIBLE FATS AND OILS (1934–38 AVERAGES)

Level of Fat Consumption	Indigenous Production	Net Imports (or Exports—)	Apparent Consumption	Percentage of World Population
	(.... *Thousand metric tons in oil equivalent*....)			(*Percentage*)
High fat consumption (27 kg. per caput and over)				
Net exporters (Denmark, Norway, Australia, and New Zealand)	890	— 420	470	
United States of America	3,100	770	3,870	
Other importers	1,810	2,560	4,370	
SUBTOTAL	5,800	2,910	8,710	14
Fairly high fat consumption (15–27 kg.)				
Argentina/Uruguay	910	— 600	310	
Other exporters	710	— 45	665	
Net importers	1,205	1,040	2,245	
SUBTOTAL	2,825	395	3,220	8
Fairly low fat consumption (9–15 kg.)				
U.S.S.R. and 3 Baltic States	2,280	— 55	2,225	
Net importers	765	95	860	
SUBTOTAL	3,045	40	3,085	13
Low fat consumption (below 9 kg.)				
Net importers	900	220	1,120	
Net exporters	10,830	—3,565	7,265	
SUBTOTAL	11,730	—3,345	8,385	65
TOTAL	23,400	[1] 5,900	23,400	100

[1] This figure represents the total export of indigenous material and is considerably larger than the addition of the net export balances of each area, since many countries export part of their supplies of indigenous material yet have large or relatively large imports.

Nevertheless, there will inevitably be continued heavy pressure for more supplies to meet the present unsatisfied demand. The situation clearly calls for a careful review of production plans and prospects, not only within each country but on an international basis.

SUGAR

Current Situation

The sugar situation changed during 1947/48 from one of shortages and allocations to one raising fears of future surpluses. World production in 1947/48 exceeded that of the previous year by over 1 million metric tons and was slightly above the 1934-38 prewar average. On a per caput basis, however, 1947/48 production still was 7 percent below the prewar average. Production in the Western Hemisphere was 4.7 million tons above prewar. The United States of America and Cuba each produced a record output. Production was down 2.2 million metric tons in Asia and 2 million tons in Europe (see Table 62). In Europe 1947 production was badly damaged by drought and marked a relapse from 1946 production levels. In Asia, however, and notably in India and Taiwan, 1947/48 production showed a general improvement over the previous year.

TABLE 62.—SUGAR: PRODUCTION (RAW VALUE), BY REGIONS, 1934–38 AVERAGE, 1946, AND 1947

Region	Production			Production Increase or Decrease in 1947/48 over	
	1934–38	1946/47	1947/48	1934–38	1946/47
	(*Thousand metric tons*)				
Western Hemisphere					
Cuba	2,837	5,848	6,100	3,263	−252
Other Caribbean, Mexico, and Central America	2,242	2,644	2,617	375	− 27
United States and Canada	1,736	1,868	2,082	346	214
South America	2,199	2,849	2,968	769	119
TOTAL	9,014	13,209	13,767	4,753	558
Europe	6,536	5,187	4,536	−2,000	−651
Asia					
Java, Philippines, and Taiwan	3,429	187	757	−2,672	570
Other Asia	3,947	4,082	4,409	462	327
TOTAL	7,376	4,269	5,166	−2,210	897
Africa	1,146	1,196	1,394	248	198
Oceania	1,717	1,351	1,542	−175	191
WORLD TOTAL (excl. U.S.S.R.)	25,789	25,212	26,405	616	1,193

NOTE: Years refer to production year generally beginning 1 September. Figures include Indian gur and Philippine panocha and muscovado; other low-grade sugars are excluded.

The prospects for the 1948 season are extremely good in Europe, where the area planted in almost all countries is larger than prewar and production may approach 6 million tons raw value. The production outlook is less favorable in the United States. It is too early to make any forecast for next season's sugar output in Cuba but production will continue to expand in other Latin-American countries. In Far Eastern areas production is likely to be better than in the past year, notably in the chief exporting areas of Java, the Philippines, and Taiwan.

The pattern of international trade continues to be radically different from prewar. The share of the Caribbean in world exports in 1947 was about 75 percent, compared with 38 percent prewar. The three large Asiatic exporters, Java, the Philippines, and Taiwan, which formerly exported more than 2.8 million metric tons, exported negligible quantities in 1947/48 but may supply something approaching 1 million tons in 1948/49. This should somewhat ease the dollar drain on European sugar importers, which has been acute during the period of almost exclusive reliance on the Caribbean.

Europe's 1947 imports were less than 80 percent of prewar, the decrease falling mainly on France, Belgium, the Netherlands, and the United Kingdom (see Table 63).

TABLE 63.—SUGAR TRADE IN CALENDAR YEARS, SELECTED COUNTRIES, 1934–38, 1946, AND 1947

Country	Exports			Imports			Net Trade (Exports− Imports+)		
	1934–38	1946	1947	1934–38	1946	1947	1934–38	1946	1947
Europe	(*Thousand metric tons*)								
Belgium-Luxemburg	104	0	6	132	48	37	+ 28	+ 48	+ 31
Czechoslovakia	213	141	196	0	0	0	− 213	− 141	− 196
France	234	8	159	363	269	86	+ 129	+ 261	− 73
Norway	0	0	0	88	79	79	+ 88	+ 79	+ 79
Netherlands	63	0	41	136	158	51	+ 73	+ 158	+ 10
Poland	81	26	116	0	4	0	− 81	− 22	− 116
Switzerland	1	0	1	152	90	204	+ 151	+ 90	+ 203
United Kingdom	352	163	277	2,203	1,486	1,902	+1,851	+1,323	+1,625
TOTAL	1,048	338	796	3,074	2,134	2,359	+2,026	+1,796	+1,563
Western Hemisphere									
Canada	2	1	1	427	399	461	+ 425	+ 398	+ 460
United States	81	361	186	2,747	3,713	5,346	+2,666	+3,352	+5,160
British West Indies[1]	221	329	104	3	0	0	− 218	− 329	− 104
Cuba	2,560	3,723	5,583	0	0	0	−2,560	−3,723	−5,583
Dominican Republic	421	412	462	0	0	0	− 421	− 412	− 462
Puerto Rico	776	853	931	0	0	0	− 776	− 853	− 931
Peru	306	260	276	0	0	0	− 306	− 260	− 276
British Guiana	172	171	171	0	0	0	− 172	− 171	− 171
TOTAL	4,539	6,110	7,714	3,177	4,112	5,807	−1,362	−1,998	−1,907
Asia, Africa, and Oceania									
Indonesia	1,045	0	2	0	...	...	−1,045	...	− 2
Japan	198	0	0	970	2	42	+ 772	+ 2	+ 42
French Morocco	8	0	0	200	96	94	+ 192	+ 96	+ 94
Australia	430	154	53	0	0	0	− 430	+ 154	− 53
Hawaii	841	543	732	1	0	...	− 840	− 543	− 732
Fiji Islands	131	100	143	0	0	...	− 131	− 100	− 134
TOTAL	2,653	797	921	1,171	98	136	−1,482	− 699	− 785
GRAND TOTAL	8,240	7,245	9,431	7,422	6,344	8,302	− 818	− 901	−1,129

[1] Includes Barbados, Windward Islands, Leeward Islands, and Jamaica.

In Asia the occupation authorities imported into Japan only 42,000 metric tons compared with nearly a million prewar, but imports will be higher in 1948. By contrast United States sugar imports doubled and, in order to meet a very high domestic demand, in 1947 reached the record figure of 5,346,000 metric tons.

Consumption of sugar has increased rapidly during the last 10 years in North and South America and in Africa—by as much as 30 to 40 percent per person. It has declined in Asia and in Europe. Indeed, Europe's supplies in 1947/48 were notably smaller than in the previous year. Consumption in most deficit countries is still heavily curtailed by rationing and would otherwise be much larger; under present conditions of high purchasing power, the taxes levied on sugar do not act so effectively as a deterrent on buyers as they did in the 1930's.

Consumption has increased rapidly in French North Africa and the Union of South Africa. As a result, the former has become a larger importer and the latter has ceased to export at least for a time. In Latin America, most of the increased production is for local consumption, but Mexico has recently joined the ranks of exporting countries and may export 150,000 metric tons in 1949.

Future Outlook

The concern over future surplus arises from the expected recovery in European production and in exports from Asia at the same time as production in the Caribbean remains high. In the 1947/48 season no Caribbean surplus arose, largely because the United States Government purchased 1.1 million metric tons of the Caribbean crop for use in occupied ex-enemy countries and in countries co-operating with the Economic Co-operation Administration. For the calendar year 1948, Cuba was also assigned part of the Philippine quota for United States imports, bringing the Cuban quota for shipment to the United States up to 2.6 million metric tons. As a result, present indications are that any stocks in the Caribbean at the end of 1948 will be small.

The uncertainty about the Cuban crop in 1949 and the extent to which Europe may be able to import sugar from soft currency areas, coupled with a continuous weakening of prices on the futures market, has caused some governments to consider the desirability of reviving the International Sugar Agreement. At the August 1948 meeting of the International Sugar Council, following a request from Cuba for a new agreement, a working party was set up to examine the desirability of negotiating an agreement and the form such an instrument might take.

In a period of uncertainty like the present, many governments desire international assurances in some form, so that they may plan production and foreign trade programs. Other governments faced with problems of postwar reconstruction are not yet able to say whether and to what extent they wish to resume their exports or their imports of sugar and are not willing to be bound by quota regulations. It would, of course, be possible in these circumstances to negotiate a transitional agreement of more limited duration, with the understanding that quotas assigned for the transitional period would not be regarded as appropriate for a subsequent agreement but would be liable to substantial revision. Whatever may be done, it has to be remembered that sugar production constitutes the livelihood of large numbers of people in low-income countries, just as sugar-beet cultivation is an integral part of the farming system of many high-income countries. It is not easy for farm populations to turn suddenly to another crop or move to a completely different occupation. If adjustments have to be made, they should be made gradually so that the people will not suffer from them.

LIVESTOCK PRODUCTS

Current Situation

The most notable change in the livestock situation during the past year has been the reduced output of livestock products in North America and western Europe, largely on account of the poor maize crop in the United States in 1947 and the general failure of crops in western Europe because of drought. Meantime, there have been small increases in output during the year in eastern Europe, South America, and Oceania.

The war seriously injured the livestock industry of Europe, and the damage was even more serious in eastern than in western European countries. Recovery has been very slow, partly because of unfavorable weather, and partly because government policy has emphasized crops for direct human consumption. The present level of output is only about 65 percent of prewar (see Table 64). Prospects for 1948/49, however, are improved because of the generally excellent 1948 harvest, which will provide not only more feed crops but also more milling offal as the flour extraction rates begin to be reduced.

In the United States and Canada, where output of meat, milk, and dairy products expanded enormously during the war, there are good prospects for a reversal of the downward trend of the past three years as a result of excellent 1948 crops. However, the main effects of the improved situation will not become apparent in increased milk and meat output until late in 1949. In South America prospects are also good. The cattle industry of Uruguay is recovering from the disastrous drought of 1943, and in Brazil, Argentina, and Chile local demand for livestock products continues strong. There has been a notable increase in output of milk and dairy products since the prewar period. In Australia and New Zealand the gradual upward movement is likely to continue.

International trade in livestock products is largely a movement of supplies from a few countries, principally Argentina, Australia, New Zealand, Canada, and Denmark, to the United Kingdom (see Table 66). During 1947/48, United Kingdom imports of meat and dairy products have remained at about the same level as in 1946/47, but the large imports of meat into eastern Europe which occurred in 1946/47 under UNRRA's auspices, and which came principally from North America, have now ceased.

Whereas during the war the United Kingdom, for shipping reasons, relied more heavily on supplies from North America, Argentina, and Uruguay, it is now reverting gradually to prewar sources of supply. The United Kingdom currently takes all the exportable surpluses of meat and dairy products from New Zealand and Australia and is beginning to resume imports from Europe, particularly Denmark. The minor European exporters, namely the Netherlands, Sweden, Finland, and Poland, have as yet very little to offer.

Because of some decline in production and the continued high level of per caput consumption, the United States of America has ceased to be an important exporter of meat and in 1948 will import more than it exports. Exports of dried milk from dollar areas, while still important, are in demand primarily in relief programs. Canada's exports are declining as a result of the rearrangement of United Kingdom sources of supply. Exports from Australia and New Zealand are maintained at a steady level, but they continue to include slightly more cheese and less butter than prewar. Efforts are being made in both these countries to increase production of animal products for export.

The United Kingdom has contracts with each of the major suppliers. Currently

TABLE 64.—PRODUCTION OF MEAT, MILK, BUTTER, AND CHEESE IN THE PRINCIPAL PRODUCING AREAS, PREWAR, 1946/47, AND 1947/48

Producing Area	Meat (excl. poultry) [1]			Milk			Butter			Cheese		
	1934–38	1946/47	1947/48	1934–38	1946/47	1947/48	1934–38	1946/47	1947/48	1934–38	1946/47	1947/48
	(*Thousand metric tons*)											
Europe (excl. U. S. S. R.)	12,900	7,701	7,833	104,022	73,624	69,121	1,665	1,056	911	1,447	897	917
Western Europe [2]	9,268	5,681	5,513	69,667	56,488	50,260	1,243	879	730	793	552	521
Eastern Europe (excl. U. S. S. R.)	3,632	2,020	2,320	34,355	17,136	18,861	422	177	181	654	345	396
United States and Canada	8,635	12,444	12,085	54,751	62,327	60,907	1,144	909	858	344	611	570
Argentina, Brazil, Uruguay, and Chile [3]	4,886	4,937	5,248	8,000	9,625	9,630	70	105	105	90	160	150
Australia and New Zealand	1,540	1,516	1,546	9,834	9,678	9,766	367	297	316	111	137	139

[1] Dressed carcass weight including offal. Slaughter fats excluded.
[2] Western Europe includes United Kingdom, Ireland, Iceland, Sweden, Norway, Denmark, the Netherlands, Belgium, Luxemburg, France, Germany, Switzerland, Spain, and Portugal.
[3] For South American countries the figures are for 1934–38, 1946, and 1947.

TABLE 65.—CONSUMPTION OF PRINCIPAL LIVESTOCK PRODUCTS IN MAJOR CONSUMING AREAS, PREWAR, 1946/47, AND 1947/48

Consuming Area	Meat (excl. poultry) [1]			Milk [2]			Butter			Cheese		
	1934–38	1946/47	1947/48	1934–38	1946/47	1947/48	1934–38	1946/47	1947/48	1934–38	1946/47	1947/48
	(*Kilograms per caput per year*)											
Europe (excl. U. S. S. R.)	37.1	24.8	24.7	99.8	84.0	79.5	5.4	3.2	2.9	4.1	2.8	2.9
Western Europe [3]	47.1	31.1	30.2	103.3	97.6	90.7	7.4	4.4	3.9	4.4	3.1	3.0
Eastern Europe (excl. U. S. S. R.)	22.9	14.8	16.0	94.9	62.8	61.9	2.6	1.3	1.2	3.6	2.3	2.6
United States and Canada	61.8	77.1	74.8	155.4	188.7	180.0	8.2	5.9	5.4	2.4	3.3	3.2
Argentina, Brazil, Chile, and Uruguay [4]	67.1	56.2	60.0	83.2	77.2	80.0	1.1	1.3	1.2	1.5	2.0	1.9
Australia and New Zealand	119.3	94.6	98.3	112.6	142.3	142.1	16.5	13.0	10.3	1.4	3.3	3.0

[1] Dressed carcass weight including offal. Slaughter fats are excluded.
[2] Consumed as whole or as standardized milk.
[3] Western Europe includes United Kingdom, Ireland, Iceland, Sweden, Norway, Denmark, the Netherlands, Belgium, Luxemburg, France, Germany, Switzerland, Spain, and Portugal.
[4] For South American countries the figures are for 1934–38, 1946, and 1947.

TABLE 66.—NET TRADE (IMPORTS LESS EXPORTS) IN PRINCIPAL LIVESTOCK PRODUCTS FOR MAJOR CONSUMING AREAS, PREWAR, 1946/47, AND 1947/48

Consuming Area	Meat (excl. poultry) [1]			Butter			Cheese		
	1934–38	1946/47	1947/48	1934–38	1946/47	1947/48	1934–38	1946/47	1947/48
	(*Thousand metric tons*)								
Europe	+1,371	+1,722	+1,600	+299	+156	+194	+81	+197	+179
Western Europe [2]	+1,357	+1,556	+1,544	+328	+138	+188	+106	+189	+184
United Kingdom	+1,660	+1,567	+1,600	+481	+210	+259	+142	+192	+190
Denmark	−256	−133	−131	−149	−87	−100	−10	−17	−15
Ireland	−215	−137	−155	−25	...	...	...	...	...
Eastern Europe (excl. U. S. S. R.)	+14	+166	+56	−29	+18	+6	−25	+8	−5
United States and Canada	−48	−489	−256	0	+1	−6	−10	−105	−64
Argentina, Brazil, Uruguay, and Chile [3]	−956	−936	−914	−8	−13	−15	−2	−17	−10
Australia and New Zealand	−543	−636	−616	−229	−176	−219	−97	−113	−111

+ Net imports.
− Net exports.
[1] Dressed carcass weight including offal. Slaughter fats excluded. Meat equivalent of live animal trade is included for European countries.
[2] Western Europe includes United Kingdom, Ireland, Iceland, Sweden, Norway, Denmark, the Netherlands, Belgium, Luxemburg, France, Germany, Switzerland, Spain, and Portugal.
[3] For South American countries the figures are for 1934–38, 1946, and 1947.

these agreements cover the entire surplus of Australia and New Zealand, 73 percent of Argentine meat exports, 65 percent of Danish butter exports, and 80 percent of Danish bacon exports, while agreements with Canada cover nearly its total surplus of meat and cheese. For a variety of reasons, these contracts have been negotiated at prices lower than the export prices in other markets. For example, in December 1947, American importers were paying for Argentine canned beef prices about 45 percent above the British contract price. Moreover, on a rising market such as has been experienced since the war, contracts have undoubtedly worked to the disadvantage of the exporting countries, since prices have risen more rapidly than was anticipated at the time contracts were entered into or renewed. For example, the 1948 Canadian-United Kingdom cheese contract provides for a price of 30 cents per pound, yet the domestic (Montreal) price in June 1948 was 33 cents. Similarly, the contract price of top-grade beef in May 1948 was 27.5 cents per pound in contrast with an average domestic price of 31.4 cents at Toronto for the same month. As a result of this situation and because of the United Kingdom's shortage of dollar exchange, the two governments agreed that the remainder of the 1948 beef contract should be met by shipments of bacon, and in August Canada lifted the embargo which for six years had prevented shipments of live cattle (other than breeding stock) and beef to the United States. This action resulted in a marked increase in Canadian cattle prices. Under existing trade agreements between Canada and the United States, most of Canada's exports of other animal products could, in the absence of Canadian restrictions, enter the United States at prices in excess of the United Kingdom contract prices. Nevertheless, the contract prices have been advancing in each year, with very marked increases in 1948. The following figures show the change as between early 1947 and mid-1948:

1948 British Contract Prices as Percentages of 1947

	Bacon	*Beef*	*Butter*	*Cheese*
Canada	144	114	....	120
Denmark	140	112	134	....
New Zealand	118.5	118.5	135	130
Australia	108	110	[1] 117	[1] 111

[1] Does not include prices renegotiated in July 1948.

Consumer demand for livestock products is everywhere high, a natural result of high levels of purchasing power. But whereas in the United States this demand has been translated into high-level consumption, in Europe and until recently in the British Dominions consumption has been curtailed by rationing. European countries, apart from the United Kingdom, which imports such a high proportion of its meat and dairy products, have found rationing extremely difficult to enforce and have in many cases abandoned the attempt to continue controls.

Future Outlook

The longer-term outlook for the livestock industry of the more advanced countries depends largely on the outlook for feed grains and for oilcake and meal. The 1948/49 favorable outlook for cereals benefits all the countries concerned, but there still remain difficulties for those which hitherto relied on large imports of feed grain. Formerly, large quantities were obtained from southeastern Europe and Argentina, and smaller amounts from the United States, U.S.S.R., and the Near East. At present, southeastern Europe's exports are still low, Argentina's are less than one-half the prewar quantity, and the United States has become the principal supplier, thereby aggravating the dollar problem. Already prices are being adjusted downward, which should help the livestock industries of the feed-deficit countries. However, the continued reliance on two countries, Argentina and the United States of America, for almost the entire supply of coarse grains creates great uncertainties for the future. A crop failure in either country might renew the condition of scarcity.

Much less promising is the outlook for protein feeds, principally oilcake and meal. Table 67 shows Europe's supply in 1947 and estimated supplies in 1948/49 compared with prewar.

TABLE 67.—EUROPE (EXCLUDING GERMANY): SUPPLIES OF OILCAKE AND MEAL, PREWAR, 1947, AND ESTIMATES FOR 1948/49

Type of Oilcake and Meal	Prewar	1947	1947 as Percentage of Prewar	1948/49 Estimates
	(....*Thousand tons*....)		(*Percentage*)	(*Thousand tons*)
From home-grown seed	181.5	146.7	81	170
From imported seed	3,282.2	920.0	28	1,010
Imported as cake or meal	1,730.8	1,341.2	77	1,520
TOTAL OR AVERAGE	5,194.5	2,407.9	46	2,700

The contrast would be even greater if Germany, which before the war consumed 1.2 million tons of cake and since the war has received none, were included. The table shows not only the serious shortfall in supplies but also the change in the character of the trade, a large fall in import of seeds for crushing in Europe.

While some improvement is to be expected in 1948/49, any major recovery in supplies of oilcake is bound up with the future of the world's oils supply, which, as has been seen, is not hopeful. Already a number of European countries are seeking to make such adjustments as may be possible by trying to increase the protein content of domestically produced feedstuffs, improving pasture management, increasing silage of green crops, and grass drying.

The longer-term outlook for the world's livestock industry depends to a high degree on the rate of progress which could be made in improving standards of living. At the

present time consumer demand is high in almost all countries but, as was noted in Part I, this demand has gone largely unsatisfied. On the other hand, consumption of livestock products has during this period increased among certain groups in the advanced countries where formerly consumption was low. Such, for example, has been the effect of rationing and retail price subsidies in some European countries; a similar trend is observed in certain other countries where particular occupational groups have benefited from inflationary wages. This situation is creating food habits which the groups concerned will try to maintain.

If the demand for livestock products generated by present levels of purchasing power were satisfied there would, in the absence of all controls, be an immense strain upon the world's agricultural resources. One effect would be a reduction of the surplus of both livestock products and of feedstuffs available for export from the United States and certain South American countries. There would be an attempt in Continental Europe to raise the level of crop yields and so increase the supply of feedstuffs to support a larger number of livestock. In the United Kingdom the further expansion of consumption would soon reach a limit imposed by capacity to pay for imports, and this limit would in turn set limits to the livestock production programs of Australia, New Zealand, and the other principal suppliers of the United Kingdom.

In the low-income countries consumption of livestock products is as yet unimportant. There are prospects for gradual expansion of the livestock industry in such of the more sparsely populated of these countries as are situated in the temperate zone, but in the densely populated countries and those in tropical zones the opportunities are quite limited. For these countries—and they contain the bulk of the world's low-income population—a demand for livestock products could reach substantial proportions only when a sufficient volume of exports had been developed to finance the import of such products. The one exception is dried milk, which a number of countries might import for their special nutritional programs.

Apart from this, it seems that for some time to come the production and consumption of meat and dairy products will continue to be confined to a relatively small number of higher-income countries, and within this group the livestock industry seems likely to prosper as long as present high levels of employment and income are maintained.

Chapter 13

AGRICULTURAL PRODUCTS—FIBERS

NATURAL fibers used in manufacture include a large variety of different materials of vegetable and animal origin. Of these, the following nine fibers of major economic significance are considered in this report: cotton, wool, silk, flax, hemp, jute, abaca, sisal, and henequen. The last three are the major hard fibers.

The world structure of natural fibers economy has several characteristic features, among which the following are perhaps of special significance:

(1) The ratio of world trade to production is much higher for the natural fibers than for most foodstuffs. While almost all countries produce some fibers, large-scale production for the world market is concentrated in a relatively small number of countries outside Europe, with the exceptions of flax and hemp, which are mainly European crops. The United States, India, Pakistan, Egypt, and Brazil account for the bulk of the total cotton exports. More than four-fifths of all wool entering international trade comes from five countries of the Southern Hemisphere—Australia, Argentina, New Zealand, South Africa, and Uruguay. The world silk market is dominated by exports from Japan. Three-quarters of the jute crop is grown in Pakistan and nearly all the world's jute comes from the subcontinent of India in the form of fiber or fabric. Crops of the major hard fibers are also highly concentrated by origin—about 90 percent of abaca cultivation is in the Philippine Republic, more than one-half of the world sisal crop in British East Africa, and nine-tenths of all henequen in Mexico.

(2) The economy of most of the major fiber-exporting countries is greatly dependent on receipts obtained from the sales of their products. This is indicated in Table 68, which shows prewar and postwar exports of fibers expressed as percentages of total exports for the main fibers and the chief exporting countries.

While more than nine-tenths of world fiber production is still accounted for by the natural fibers, the output of man-made fibers has resumed a strong upward trend in the postwar period. Sharply increased prices of natural fibers have changed the cost relationship between natural and synthetic textile raw materials. The recent weakening of some markets for fibers still leaves the prices of most types of natural fibers at levels very much higher than those of prewar, while the synthetic fibers are only moderately higher.

The range of raw materials employed in the production of man-made fibers is being constantly widened. Animal and vegetable proteins as well as materials of mineral origin are utilized in production of synthetic fibers. The quantitative importance of these raw materials is, however, minor. The bulk of the world's production of man-made fibers consists of rayon filament yarn and staple. These cellulose fibers are predominantly derived from wood pulp and to a very minor extent from cotton linters. Nylon, which is rapidly rising in importance, is made from benzene or phenol, ammonia, and oxygen.

TABLE 68.—EXPORTS OF FIBERS AS PERCENTAGES OF TOTAL EXPORTS IN SELECTED COUNTRIES, 1936–38 AND 1946

Fiber-exporting Countries	Percentage of All Exports (Values)	
	1936–38	1946
Western Hemisphere		
Brazil (cotton)	19	16
Peru (cotton)	23	33
United States (cotton)	11	6
Uruguay (wool)	46	34
Eastern Hemisphere		
Africa		
Egypt (cotton)	74	73
Kenya (sisal)	15	12
Sudan (cotton)	63	51
Tanganyika (cotton and sisal)	52	48
Uganda (cotton)	74	58
Union of South Africa (wool)	29	33
Asia		
India (cotton and jute)[1]	42	39
Philippines (abaca)	[2] 14	11
Oceania		
Australia (wool)	35	32
New Zealand (wool)	24	27

[1] Includes jute manufactures.
[2] 1936–37.

TABLE 69.—WORLD PRODUCTION OF FIBERS, 1938/39, 1946/47, AND 1947/48 [1]

Fiber or Fiber Group	Quantities			Percentage Change from 1938/39		Percentage Change from 1946/47	Production as Percentage of All Fibers (By Weight)	
	1938/39	1946/47	1947/48 [2]	1946/47	1947/48 [2]	1947/48	1938/39	1947/48 [2]
	(*Thousand metric tons.*)			(*Percentage*)			(*Percentage*)	
1. Cotton	6,495	4,673	5,530	−28	−15	+18	54.6	54.3
2. Wool, clean	1,086	1,032	1,014	−15	− 7	− 2	9.1	10.0
3. Raw silk	50	11	12	−78	−76	+ 9	0.4	0.1
4. Flax	807	350	390	−57	−52	+12	6.8	3.8
5. Hemp	414	225	300	−46	−28	+33	3.5	2.9
6. Jute	1,665	1,050	1,575	−37	− 5	+50	14.0	15.5
7. Hard fibers [3]	509	365	449	−28	−12	+23	4.3	4.4
8. Rayon filament yarn	452	499	595	+10	+32	+19	3.8	5.8
9. Rayon staple fiber	421	260	308	−38	−27	+18	3.5	3.0
10. Nylon [4]	—	14	18	—	—	+29	—	0.2
TOTAL	11,899	8,479	10,191	−29	−14	+20	100.0	100.0
Natural fibers (1–7)	11,026	7,706	9,270	−30	−16	+20	92.7	91.0
Man-made fibers (8–10)	873	773	921	−11	+ 5	+19	7.3	9.0
Mainly apparel and household (1–4 and 8–10)	9,311	6,839	7,867	−27	−15	+14	78.2	77.2
Mainly industrial (5–7)	2,588	1,640	2,324	−37	−10	+42	21.8	22.8

[1] Data for cotton, wool, and jute relate to production seasons; those for silk, flax, hemp, hard fibers, rayon, and nylon relate to calendar years.
[2] Preliminary.
[3] Abaca, sisal, and henequen.
[4] Approximate estimates.

Recent Trends

Expansion of the world area under fiber crops from the severely curtailed wartime levels was greatly limited during the first three postwar seasons by the overriding necessities of the world food situation. The combined 1947/48 output of the major natural fibers was about one-fifth higher than a year earlier but still 14 percent below the output of the last prewar season. (See Table 69.) With a rise in world population of approximately 9 percent during the last decade, the 1947/48 output of fibers per caput was nearly one-quarter below prewar.

World consumption of the major natural fibers, while still below prewar, has been exceeding current production during the first three postwar seasons. The resulting decline of world stocks of fibers has surpassed by far expectations held at the end of the war, when it was feared that surpluses of cotton and wool might constitute a serious drag on the market and lower producers' returns.

Production Outlook

At present, however, there are indications of a turning of the tide, especially in regard to the world's supply of raw cotton.

Cotton

Planting of fibers to be harvested during the 1948/49 season has been stimulated by remunerative returns compared with those from some other crops, by the relaxation of restrictions on planting area in some countries, and by the continuation of development programs in others. Because of exceptionally favorable weather, increased use of fertilizer, and a larger portion of the cotton being planted in heavy-yielding districts, the United States cotton crop, which will be harvested from an area about 10 percent larger than in 1947/48, is estimated the seventh largest on record and about 28 percent above that of the previous season. Considerable cotton area increases are reported from India, Egypt, northern Brazil, and Mexico, and some expansion is expected in most of the other cotton-producing regions.

The outlook for the production of other major fibers can be briefly summarized as follows:

Wool

Production in the chief exporting countries has been stimulated by remunerative prices, but the 1948/49 world clip will probably not increase by more than 3 to 5 percent. The decline in North American wool production may be expected to continue.

Silk

World production in 1948 is still not likely to exceed one-quarter of prewar. In Japan, production is expected to be about 10 percent higher than in 1947, while Italian output may decline considerably.

Flax and Hemp

Some expansion in world production of both flax and hemp should occur in 1948, owing to the emphasis being placed on these fibers in the agricultural programs of eastern European countries and the U.S.S.R.

Jute

No official forecasts of 1948/49 production of jute in India and Pakistan are yet at hand. However, preliminary estimates indicate that the area planted was about 5 percent larger than in 1947 but that corresponding increases in production may not be realized, owing to recent excessive rainfall.

Hard Fibers

The production outlook in sisal and henequen in most of the major producing regions is favorable, and moderate gains in world output of these fibers in 1948 are anticipated. World output of abaca in 1948 will probably fall below the 1947 level.

Rayon

It is estimated that by the end of 1948 the world rayon industry may have a maximum operable capacity of 1,500,000 tons.[1]

Changes in Production Pattern

Changes in the production of fibers by continents are shown in Table 70. The world's major fiber-producing regions are North and Central America and Asia, which

TABLE 70.—WORLD PRODUCTION OF FIBERS BY CONTINENTS, 1934–38 AVERAGE, 1946/47, AND 1947/48 [1]
(Cotton, Wool (Clean), Silk, Flax, Hemp, Jute, Sisal, Abaca, Henequen, Rayon Filament and Staple Fiber, and Nylon)

Continent	1934–38	1946/47	1947/48 [2]
	(*Thousand metric tons*)		
Europe (excl. U.S.S.R.)	815	747	831
U.S.S.R.	1,558	817	1,008
North and Central America	3,205	2,634	3,431
South America	720	687	686
Asia	4,465	2,506	3,128
Africa	835	719	734
Oceania	356	369	373
TOTAL	11,954	8,479	10,191
	(*Percentage of world total*)		
Europe (excl. U.S.S.R.)	7	9	8
U.S.S.R.	13	10	10
North and Central America	27	31	33
South America	6	8	7
Asia	37	30	31
Africa	7	8	7
Oceania	3	4	4
TOTAL	100	100	100
	(*Index: 1934–38=100*)		
Europe (excl. U.S.S.R.)	100	92	102
U.S.S.R.	100	52	65
North and Central America	100	82	107
South America	100	95	95
Asia	100	56	70
Africa	100	86	88
Oceania	100	104	105
AVERAGE	100	71	85

[1] Data for cotton, wool, and jute relate to production seasons; those for silk, flax, hemp, hard fibers, rayon, and nylon relate to calendar years.
[2] Preliminary.

[1] Textile Economics Bureau, *Rayon Organon,* New York, June 1948.

together accounted for about 64 percent of the total output in 1934-38. Production in North and Central America was 7 percent higher in 1947/48 than before the war because of a vast expansion of rayon production, which was almost four times as large as the 1934-38 average and more than counterbalanced the lower output levels of cotton and wool (clean basis). Production of fibers for 1947/48 in Asia, on the other hand, was merely 70 percent of prewar, reflecting the decline of cotton production in India and China, the lower levels of jute output in Pakistan, and the drastic reduction in hard fibers production in Indonesia and in the Philippines and in rayon manufacture and sericulture in Japan. Europe's share in world production of fibers is extremely small compared with its importance as a consumer of textile raw materials. Production of fibers in the U.S.S.R. exceeds that of all Europe, but output of fibers in the U.S.S.R. for 1947/48 was low, owing to a cotton crop below prewar and to the reduced size of postwar flax and hemp crops. The African share, accounting for 7 percent of the 1947/48 total, represents cotton production of the continent, wool clips of the Union of South Africa and of North African territories, and sisal production in colonial territories. Oceania, though of predominant importance as a supplier of apparel wool, contributes the smallest continental share of world output of fibers by volume.

World Consumption and Trade

World consumption of fibers in the postwar period has been strongly influenced by high levels of mill activity in the United States and by consumption larger than that of prewar in a number of Latin-American countries and in the British Dominions. The major fiber-importing regions—Europe and the Far East—have not yet reached prewar levels of textile manufacturing activity though mill activity is running at or above prewar levels in some European countries. Measures aiming at the revival of Japan's textile manufacture still leave the country's industry at a mere fraction of prewar. Table 71

TABLE 71.—COTTON: CONSUMPTION BY MAJOR AREAS, 1934–38, 1946/47, AND 1947/48

Consuming Area	Quantities Consumed			Index of Change		Percentage of Total	
	1934–38	1946/47	1947/48	1946/47	1947/48	1934–38	1947/48
	(....*Million bales*[1]....)			(*1934–38=100*)		(..*Percentage*..)	
Reduced Consumption							
United Kingdom	2.75	1.68	1.91	61	69	9.4	6.7
Continental Europe	5.50	4.74	5.15	86	94	18.7	18.0
U.S.S.R.	3.05	1.70	1.91	56	63	10.4	6.6
Japan	3.45	0.73	0.61	21	18	11.8	2.1
China [2]	3.08	2.87	2.90	93	94	10.4	10.0
TOTAL OR AVERAGE	17.83	11.72	12.48	66	70	60.7	43.4
Increased Consumption							
United States	6.45	10.02	9.35	155	143	22.0	32.5
Latin America	1.10	1.87	1.84	170	167	3.8	6.4
India (subcontinent)	3.00	3.47	[3] 3.78	115	126	10.2	13.1
Other areas	0.97	1.26	1.31	130	135	3.3	4.6
TOTAL OR AVERAGE	11.52	16.62	16.28	144	140	39.3	56.6
TOTAL CONSUMPTION	29.35	28.34	28.66	97	98	100.0	100.0

SOURCE: Data compiled by the International Cotton Advisory Committee, Washington, D. C.
[1] Bales of 226.8 kg. net weight except for running bales for the U. S. A.
[2] Includes estimates for home consumption.
[3] Dominion of India, 3.55 million bales; Pakistan, .23 million bales.

gives cotton consumption in selected areas; if other apparel fibers could have been included, they would not alter the broad classification of regions into those above and those below the prewar level of consumption.

The slow recovery of world trade in fibers has been largely linked with these developments, though the reasons are a little more complex. In Table 72, a comparison is given of the prewar and postwar volume of shipments of fibers. The first column of the table indicates the proportion of prewar world exports covered by this summary survey for each of the major natural fibers. As will be seen, the proportions are fully or fairly representative for all fibers listed, excepting flax and hemp, for which postwar trade information is lacking for the U.S.S.R., including its newly acquired territories, and for certain eastern European countries.

With the exception of apparel-wool shipments, which in 1946/47 were inflated to some extent by the transportation of wool sold during the previous season, the postwar volume of shipments of fibers remained considerably below the prewar average, as it had generally revived more slowly than world production. In the case of raw cotton, the lowered ratio of world exports to world production reflects in part the trend of industrialization and increased consumption of raw cotton in certain major producing countries. Exports of raw jute from India have been severely limited by the curtailment of output and by the reorientation of the Bengal jute economy in 1947/48 following its partition between India and Pakistan. The drastic reduction of overseas sales of Japanese raw silk in 1947 was mainly due to difficulties of disposing of supplies in the United States market at comparatively high fixed prices and in the face of vastly increased competition from nylon and rayon filament yarn.

However, while conditions vary from fiber to fiber, the obstacles most generally applicable to world trade in fibers during the 1947/48 season were the growing impact of foreign exchange shortages in the major importing countries of Europe and the supply difficulties in Japan. At the same time, the general inflationary trend and the very high rate of textile-manufacturing activity in the United States contributed towards a very sharp rise in prices of fibers that made it even more difficult for the European importing countries to use their dwindling currency reserves for the replenishment of stocks of

TABLE 72.—EXPORTS OF MAJOR NATURAL FIBERS, PREWAR, 1946/47, AND 1947/48 [1]

Fiber Exported	Exporting Country	Percentage of World Exports in 1934–38	Quantities			Percentage of 1934–38 Average Exports	
			1934–38	1946/47	1947/48 [2]	1946/47	1947/48 [2]
		(*Percentage*)	(...*Thousand metric tons*...)			(...*Percentage*...)	
Cotton	All exporting countries	100	2,810	2,201	2,156	78	77
Wool, actual weight	Argentina, Australia, New Zealand, South Africa, and Uruguay	84	795	1,128	1,000	142	126
Raw silk	Japan and Italy	78	32	7	2	22	6
Flax	All exporting countries other than U.S.S.R., new boundaries	44	77	60	80	78	104
Hemp	Italy	51	43	14	14	33	33
Jute	India (subcontinent)	98	761	305	400	40	53
Hard fibers [3]	All exporting countries	100	490	298	366	61	75

[1] Figures for cotton, wool, and jute relate to production seasons; those for silk, flax, hemp, and the hard fibers, to calendar years.

[2] Preliminary figure.

[3] Abaca, sisal, and henequen.

TABLE 73.—AVERAGE PRICES OF MAJOR FIBERS, SELECTED PERIODS

Fibers and Wholesale Price Indices	1934–38	1946	1947	Jan.–June 1948	July 1948	1946	1947	Jan.–June 1948	July 1948
	(*U. S. cents per pound* [1])					(*Index: 1934–38=100*)			
Cotton									
United States, Middling 15/16″, 10 U. S. markets, average	11.18	30.56	34.43	35.64	34.01	273	308	319	304
Mexico, Middling 15/16″, Torreon	9.78	23.87	27.71	32.59	31.49	244	283	333	322
Brazil, Type 5, Sao Paulo	9.37	21.67	26.07	28.66	30.76	231	278	306	328
India, Jarilla fine, Bombay	7.05	17.27	16.89	24.68	25.51	245	240	350	362
Egypt, Ashmouni good, Alexandria	10.49	...	35.39	63.53	65.63	...	337	606	626
Peru, Tanguis, Type 5, Lima	7.74	22.61	24.18	30.13	36.15	242	312	389	467
Wool									
Merino—Australian, 64's average, clean basis, London	52.9	65.9	101.8	150.9	174.5	125	192	285	330
United States, Territory staple, 64's, 70's, 80's, clean basis, Boston	84.1	102.6	121.6	130.3	148.0	122	144	155	176
Crossbred—Argentina, 56's, greasy basis, Buenos Aires	...	18.3–25.6	20.8–29.5	[2] 27.3–36.5	...	...	...	...	...
New Zealand, 56's av., clean basis, London	37.6	54.1	66.8	81.7	80.6	144	177	217	214
New Zealand, 46's av., clean basis, London	26.6	39.4	44.7	49.9	47.8	148	168	188	180
Carpet—East Indian, av. white vicanere, greasy basis, Liverpool [3]	31.6	43.0–49.8	42.8–51.0	[4] 51.6–61.8	55.4–68.0	147	148	179	195
Silk									
Japanese, 13/15 denier, white, D Grade, New York	165	...	455	260	260	...	276	154	154
Rayon									
Filament, Viscose, 150 denier, U. S. A.	57	56	67	74	74	98	118	130	130
Staple Fiber, Viscose, 1½ denier, U. S. A.	30	25	32	36	36	83	107	120	120
Nylon									
30 denier, 10 filaments, U. S. A.	[5] 427	275	255	255	255	64	60	60	60
Jute									
Indian, Native Firsts, New York	4.3	9.8	15.8	17.2	18.9	228	367	400	440
Abaca									
Davao, I, New York	7.1	[6] 13.8	24.2	28.0	26.3	[6] 144	341	394	370
Sisal									
British East African, No. 1, U. K.	4.74	9.72	13.83	16.11	17.54	205	292	340	370
Henequen									
Mexican, Sisal, Grade A, U. S. port of entry	4.8	7.4	14.6	15.5	15.5	154	304	323	323
Wholesale Price Indices									
United States wholesale prices, general (Bureau of Labor Statistics)	...	...	...	...	...	151	190	204	210
United Kingdom wholesale prices, general (Board of Trade)	...	...	...	...	...	182	199	226	...

[1] Quotations in local currencies converted at International Monetary Fund rates.
[2] Four-month average (January–April).
[3] Indices calculated at mid-point of range.
[4] Four-month average: January, March, April, and May.
[5] 31 December 1939=100.
[6] 11-month average.

raw matrials. The world dollar scarcity in particular became even more acute from mid-1947 onward, thus contributing to even sharper rises in the prices of some fibers sold against other currencies. A summary survey of the postwar rise of fibers prices compared with prewar levels is given in Table 73. Prices of American cotton are about three times as high as before the war and those quoted for Egyptian types have risen out of all proportion. Australian merino values have trebled and the spread between merino and crossbred quotations has been widened markedly in the postwar period, even though medium and coarse types have also become much more costly. The sharp price rises recorded for cotton and wool appear in strong contrast to the very moderate change in the cost of rayon staple fiber, which in the United States is quoted at merely 20 percent above the prewar average.

Prices fixed for the sale of raw silk in the United States, the world's major silk market, were reduced sharply by SCAP at the beginning of 1948 and now stand at 54 percent above the prewar average. This brings the price relationship of raw silk to rayon more nearly in line with that existing before the war. At the same time, raw silk is still more than three times as expensive as rayon filament.

Prices quoted for jute and for hard fibers have risen even more sharply than those of wool and certain types of cotton. A comparison of prices of natural fibers with wholesale commodity price indices in the United States and in the United Kingdom shows that, in general, prices of natural fibers have advanced considerably more than the combined commodity indices.

Some relief against the rising foreign exchange expenditure on purchases of fibers in 1947/48 was provided to importing countries by barter agreements, general-purpose and special-commodity credits, and various types of processing arrangements. Hard-currency credit assistance in 1947 and during the first quarter of 1948 was small, however, as compared with that available in the immediate postwar period. In France the shortage of raw cotton became so acute that supplies had to be provided under the United States interim-aid program.

1948/49 World Trade Outlook

Prospects for financing trade in fibers during the 1948/49 season are better. One major factor responsible for the improved financial situation is the European Recovery Program, which will enable the participating European countries and western Germany to obtain a good share of their cotton requirements and possibly also imports of some other fibers on credit or by way of grant-in-aid.

Study of the postwar European economy reveals that the restoration of the equilibrium of balances of payments in European countries is a problem far more than transitional and that every possible effort will need to be made to promote adjustment by means of changes in the volume, composition, and direction of commodity trade. In view of the importance of imports of fibers and exports of textiles in European trade accounts, it may be inevitable to consider some shifts in sources of supply for apparel fibers, while close attention will need to be given to sales prospects for European textiles.

Official and semiprivate dollar credits and arrangements for barter with a number of countries will assist Japan in obtaining cotton from the United States, Pakistan, and Egypt and some wool from Australia, New Zealand, and South Africa, while sales of Japanese textiles will also be facilitated to some extent by barter and by the relaxation

of the originally very stringent requirements of 100 percent dollar payments for exports of textiles made in Japan from American cotton.

Wool, in contrast to cotton, is predominantly exported from sterling areas, and is an important earner of dollars. Sales have been large in the postwar period, and good demand may be expected to continue under generally favorable economic conditions. Revolving credits have been established for the wool purchases of some European countries, and special relief shipments to six countries are being provided by the Australian Government under the United Nations post-UNRRA relief program.

The U.S.S.R., while supplying eastern European countries with some cotton and wool under barter agreements, is exchanging some wheat for Egyptian cotton and has recently also appeared as a fairly substantial buyer of raw wool in the world auction market.

The scope and functions of centralized competitive world markets for fibers have been narrowed and changed in comparison with prewar by the strengthening of governmental control over trade and foreign exchange payments, enlargement of the state trading sector, and wide-scale adoption of barter and special processing arrangements. It may be noted, however, that despite these developments the importance of centralized world markets for fibers has reasserted itself to some extent in the postwar period. The system of the Joint Organisation (U. K.-Dominion Wool Disposals, Ltd.) for determining the size of wool offerings and maintaining reserve prices has been combined with the sale by private auctions of the predominant share of all wool entering world markets. The Raw Cotton Commission in the United Kingdom, which is the central organ responsible for all cotton purchases from abroad, follows the declared policy of adjusting internal selling prices of cotton to spinners to the changes in world market prices. A number of adjustments were made at short intervals since the beginning of the Commission's operations in January 1948. Thus, prices quoted in competitive or semicompetitive world fibers markets continue to govern or influence the terms of a large share of world purchases of fibers, irrespective of whether these transactions are conducted on private or government accounts.

While the supply of textiles is adequate in a number of countries, and there are even signs of growing inventories in some of them, large regions of the world are still unable to meet their requirements for these goods. Trade in semimanufactured and finished textiles is reviving slowly, and their distribution has undergone marked changes as the result of the war. Among the major factors accounting for this change are the expansion of textile-manufacturing industries in some of the newer industrial countries and the disruption of Far Eastern trade, previously dominated by exports from Japan. The first of these factors must be expected to continue and even grow in strength, while the second will readjust itself gradually. Up to the end of 1947, progress made in developing cotton textiles trade was generally slower than the revival of manufacture (see Table 74). Figures for production of textiles from other fibers are not completely available, but would show broadly the same trend except for a few countries. One striking feature of world trade in cotton textiles during the 1947 season was the large absolute and relative increase of exports from the United States which took place in the face of acute dollar shortages. With the development of supplies of textiles from other sources, the predominance of United States exports will not be maintained to the same extent as in 1947. Strenuous efforts are being made by the United Kingdom and other traditional major European textile-exporting countries to develop their postwar markets, especially in hard-currency areas.

While Japanese textile-manufacturing activity is still sharply curtailed, the long-term

TABLE 74.—COTTON TEXTILES: PRODUCTION AND EXPORTS, 1936-38 AND 1947

Country	Production [1]			Exports			Exports as Percentage of Production	
	Average 1936-38	1947	1947 as Percentage of 1936-38	Average 1936-38	1947	1947 as Percentage of 1936-38	Average 1936-38	1947
	(*Million sq. meters*)		(*Percentage*)	(*Million sq. meters*)		(*Percentage*)	(*Percentage*)	(*Percentage*)
United Kingdom	2,926	[2] 1,505	51	1,456	444	30	50	30
United States	7,132	[2] 9,030	127	211	1,254	594	3	14
Japan	3,537	552	16	[3] 2,100	334	16	59	61
Mexico	309	376	122	...	8	...	...	2
Brazil	752	1,003	133	6	134	2,233	0.8	13
India/Pakistan	3,278	3,236	99	[4] 167	[4] 209	...	5	7
France	1,171	1,087	93	313	268	86	27	25
Italy	711	836	118	304	92	30	43	11
Belgium	418	460	110	119	100	84	28	22
Netherlands	418	334	80	156	59	38	37	18
Western Germany	1,672	585	35	159	17	11	10	3
Spain, Portugal, and Switzerland	585	1,171	200	50	84	168	9	7
U. S. S. R.	3,010	2,090	69	167	...	...	6	...
Czechoslovakia	460	251	55	50	13	26	11	5
Poland	418	376	90	8	67	838	2	18
TOTAL	26,797	22,833	85	5,266	3,083	59	20	14

SOURCE: Data compiled by the Cotton Board, Manchester, England.
[1] Approximate estimates.
[2] Estimated from linear yards at prewar conversion rates.
[3] Excluding exports to Korea.
[4] By sea.

course is set by SCAP's declared policy of making "a self-supporting Japanese economy" the primary objective of the occupation. It is estimated that by 1953 the population of Japan will be 30 percent greater than that of 1930-34, while the non-farm population will be 60 percent greater. Japan must import food to live, and a larger industrial capacity than prewar will be required to maintain even the barest minimum living standards without foreign aid. Textiles will be a major group of exports required to pay for essential imports. Market prospects for manufactured goods will determine the extent to which Japan will be able to draw on foreign supplies of fibers or to supplement them by home-produced synthetic fibers. Long-term prospects for raw-silk exports are not encouraging, but the partial revival of Japanese sericulture appears necessary as an expedient to obtain or save some foreign exchange.

Long-Term Outlook

The long-term outlook for producers of natural fibers depends primarily on prospective levels of effective demand and on their ability to meet the competitive strength of synthetic fibers and other substitute materials. It may be of interest in this connection to consider trends of world production of apparel fibers, which over the long-term period can be taken as a fair indication of world consumption. (See Table 75.) From 1909-13 to 1939-43 the combined output of cotton, wool, silk, and rayon increased by about one-half, compared with a rise in world population of about one-fifth. Cotton and wool production expanded at a slightly higher rate than the world population. The fact that aggregate fiber production expanded more than the output of either cotton or wool was largely due to the spectacular development of rayon production, which rose from 0.2

TABLE 75.—WORLD PRODUCTION OF MAJOR APPAREL FIBERS AND WORLD POPULATION, SELECTED PERIODS, 1890–1947/48[1]

Period	Fibers					World Population [3]
	Cotton	Wool, Clean	Silk	Rayon [2]	Total	
	(*Index: 1909–13=100*)					
Indices						
1890	58	87	41	...	62	85
1909–13	100	100	[4] 100	100	100	[5] 100
1924–28	125	112	172	1,200	125	108
1929–33	123	115	197	2,656	126	113
1934–38	143	124	186	7,022	151	118
1939–43	130	129	159	12,822	150	[6] 121
1945/46	96	117	38	7,044	110	125
1946/47	100	124	38	8,433	117	128
1947/48 [7]	119	122	41	10,033	135	130
	(*Percentage distribution*)					
Percentage						
1890	78.6	21.1	0.3	...	100.0	
1909–13	84.2	15.1	0.5	0.2	100.0	
1924–28	84.2	13.5	0.7	1.6	100.0	
1929–33	82.0	13.8	0.8	3.4	100.0	
1934–38	79.0	14.6	0.8	5.6	100.0	
1939–43	72.6	12.7	0.6	14.1	100.0	
1945/46	73.4	15.9	0.2	10.5	100.0	
1946/47	72.2	15.9	0.2	11.7	100.0	
1947/48 [7]	74.1	13.6	0.2	12.1	100.0	

[1] Data for cotton and wool relate to production seasons; those for rayon, silk, and world population to calendar years.
[2] Rayon filament yarn and staple fiber.
[3] Population estimates are not entirely comparable for various years, because of changes in statistical reporting and compilation.
[4] 1911–15.
[5] 1910–13.
[6] 1939.
[7] Preliminary figures.

percent of the combined total in 1909-13 to 14 percent in 1939-43. Towards the end of World War II, world rayon production suffered a temporary setback, caused in part by the disruption of staple-fiber-producing industries in Germany and Japan. For the past two years, however, the curve of rayon output has again risen sharply upward, influenced by an unprecedented expansion of filament yarn production in the United States, a fair record of recovery in a number of European countries, and the development of new plants in other parts of the world. Nylon production is now well in excess of silk output.

The development of new cheap raw materials adds to the wealth of the world and, if pursued on the basis of comparative economic advantage, must be welcomed from the consumer's point of view. The effects on the major natural-fiber-producing economies are more complex, depending largely on the course of general world economic development. In an expanding world economy with rising living standards and larger industrial potential, especially in less developed countries, there may be room for the simultaneous expansion of consumption of natural and synthetic fibers. At the same time, the vastly increased food needs resulting from the expanding world income and population may then make it essential to promote shifts from natural to man-made fibers in the world production of textile raw materials. If aggregate world consumption levels are not expanded and if political insecurity and economic instability impede the use of world resources on a truly international basis, inter-fiber competition will be intensified. Under such conditions, the possibilities of technological improvement and cost reduc-

tion in the production of natural fibers, important in any circumstances, will become vital for the maintenance of their position in the world supply pattern of fibers. There is still scope for considerable expansion in production of natural fibers by methods which need not involve a proportionate extension of land use. In regard to raw-wool production, for instance, further advances in the average yield per sheep can be brought about by improved selective breeding and pasture management. Cotton yields can also be increased. In the United States, the average yield per hectare of cotton in 1941-43 was 46 percent higher than it was in 1928-32.

While the improvement of agricultural techniques should be encouraged, the problems of adjustment resulting from the uneven rate of progress in different parts of the world must also be considered. Such problems may be brought about, for instance, by the development of mechanized cotton production in the United States. The progress of fully mechanized methods of cotton cultivation and harvesting has been slow so far, owing for the most part to technical (probably largely transitory) difficulties, organizational problems, and financial limitations. However, while the development of mechanized methods in the United States may take time, the cost advantages to be derived from their adoption in many of the major cotton areas in the United States are indisputably large and the trend is clear. Other more primitive and poorer cotton-producing economies are not likely to be able to afford the introduction of mechanized methods on a scale comparable to that in the United States.

World fiber needs cannot be determined in accordance with as precise and objective standards as food needs. In the case of clothing, there are no physiological measuring rods. Apparel fibers provide warmth and protection against exposure, are essential for hygiene and comfort, satisfy conventional standards of modesty, taste, and fashion, and enable people to conform to the dictates of tradition and social environment. There is no way of reducing these varied purposes to a single standard of requirements, nor is there any objective measure of the extent to which the various fibers satisfy the above purposes. The fact that there is no exact measure of requirements of apparel fibers for human health and well-being does not mean that these needs are any the less real.

Effective demand for textiles and other fiber products depends on the level of spendable income. Calculations made for 26 countries and country groups reveal a very close relationship between prewar averages, real income levels, and net fibers consumption per caput, well-to-do countries consuming nine or ten times as much per caput as poor countries. Even when climate and social traditions are taken into account, the differences are striking. It is evident that very large increases in real incomes would be necessary to bring consumption of fibers in chronic deficit areas up to adequate levels.

Finally, it must be remembered that expenditure on clothing is liable to great fluctuations. Experience shows that changes in total income spent, especially in the low- and medium-income brackets, lead to more than proportionate changes in clothing expenditure. It is not surprising that this should be so. Given a basic minimum of apparel, clothing expenditure can be varied more easily than food expenditure or other budget items such as rent and insurance. The world's textile industry is thus particularly vulnerable to fluctuations in the level of business activity. Only the maintenance of steady and high levels of production and employment can make possible an orderly expansion in the production of fibers and textiles.

Chapter 14

FISHERIES PRODUCTS

THE shortage of land-produced food during and after the war has turned increasing attention to the sea and inland waters as sources of protein food. There is an awakening of interest in both the western and eastern nations in the latent possibilities of the fisheries. Relatively high prices have increased the extent of fishing activity. A similar influence has been exerted by the development of methods for the detection of fish in the sea, such as the use of sonic depth sounders, and by the use of improved gear, often of new pattern. In countries where fishing is mechanized the higher fisheries earnings of recent years have resulted in the building of vessels with greater cruising radius. This development, which recently has been coupled with the development of fast refrigerated carrier vessels and factory ships, is extending the areas of effective fishing operations. Largely because of exchange difficulties and other problems of reconstruction and rehabilitation, much of the trade in fisheries products is still controlled by governments. Various kinds of special stimuli for fishing, fish-processing, and trade are still in existence.

Recent Developments by Regions

Europe

Landings in Europe began to show an upward trend as soon as the war was over and have now, in the aggregate, surpassed the prewar level (see Table 76).

This increase is due partly to the exceptionally favorable catches in the North Sea and adjacent fishing grounds since the war, and partly to the greater exploitation of much more distant waters.

Increasing quantities of fresh and frozen fish are being marketed in Europe as compared with the prewar period, although further expansion of this branch of the industry is being hampered by lack of refrigerated storage and especially transportation and other distribution facilities. These storage and transportation problems are now receiving the attention of FAO in co-operation with the Economic Commission for Europe. The quantity of fish canned is also on the increase despite a shortage of tinplate. The continued shortage of olive and other vegetable oils used in canning fish has been mitigated to some extent by the use of herring oil especially refined by processes developd in Norway. This refined herring oil is suitable for use in margarine and other foods, as well as for the manufacture of soap and certain industrial products.

Countries which had exported fisheries products to Germany in the prewar period have found difficulty in re-establishing this trade, and their exports are considerably smaller than those which existed prewar. Germany imported only about 42,000 metric

TABLE 76.—LANDINGS OF FISH IN CERTAIN EUROPEAN COUNTRIES, PREWAR, 1946, AND 1947

Country	1934–38 [1]	1946	1947
	(*Metric tons, round fresh weight*)		
United Kingdom	1,162,056	1,031,885	[2] 1,111,981
Norway	1,055,674	933,300	1,205,300
France	[2] 368,968	[2] 244,500	[2] 306,600
Iceland	268,915	368,150	477,152
Germany (1934–37)	372,760	260,000	[3] 280,000
Belgium (including Luxemburg)	39,863	73,983	81,205
Denmark	90,931	197,400	205,400
Netherlands	227,546	190,362	247,283
Sweden	115,998	183,900	163,400
Finland (1933)	35,998	49,000	46,000
Ireland	10,512	21,082	18,312
Italy (1939)	120,000	160,200	132,500
Spain (1940)	438,736	594,000	[4] 450,000
Portugal (incl. Azores and Madeira)	245,470	285,569	[4] 285,000
TOTAL	4,553,427	4,593,331	5,010,133

[1] Unless otherwise indicated.
[2] Excluding shellfish.
[3] Estimated; 1946 and 1947 figures for Bizonal area only.
[4] Estimated figure.

tons of fresh herring in 1946 and 64,000 tons in 1947, as compared with 128,000 tons in 1938. This decrease was not compensated by the importation of frozen herring, which amounted to about 10,000 tons in 1946 and in 1947.

Fish landings in the Mediterranean have reached, and in some countries have exceeded, the prewar level.

Information received thus far on the progress of the 1948 fisheries is fragmentary. In Norway the winter herring catches reached record-breaking levels of 800,000 metric tons. In Iceland winter herring fisheries developed for the first time in many years and resulted in a catch of 90,000 tons. In both countries over two-thirds of the catch was used for oil and meal. However, the cod fisheries, the greater part of which are concluded in the first six months of the year, were below 1947 levels. In Norway the quantity landed was 134,000 tons, which is about one-half that landed in the same period last year, while in Iceland landings amounted to 100,000 tons as compared with 120,000 tons in 1947. In both countries a larger proportion was marketed as fresh and frozen when compared with 1947 operations. In Norway the supply of cod used for stockfish (dried, unsalted) and for salting was but one-third and one-half respectively of the quantities so used last year. In Iceland the quantity salted was less than one-third of last year.

During the first six months of 1948 British vessels landed in the United Kingdom 463,656 metric tons; in 1947 the comparable figure was 426,255 tons. In Denmark total landings amounted to 77,395 metric tons during the five months of January through May in 1948, compared with 60,066 tons durings the same period in 1947.

North America

Fish production in North America in 1947 (Table 77), while 5 percent below the 1946 figure, was 7 percent above prewar (1938). The drop in Canadian production was caused largely by reduced landings on the east coast brought about by a weakening of the United States market for frozen fillets. In Newfoundland reduced landings reflect the termination of UNRRA procurement activities. In the United States of America total production has remained fairly constant in the past several

TABLE 77.—LANDINGS IN NORTH AMERICA, PREWAR, 1946, AND 1947

Country	1938	1946	1947
	(*Thousand metric tons, round fresh weight*)		
United States	1,927	1,996	1,996
Canada	506	612	553
Newfoundland	204	377	278
TOTAL	2,637	2,985	2,827

years, although catches of individual species fluctuated greatly. On the west coast the pilchard fishery in 1948 for the second year in succession was practically a failure, with lowest landings in 20 years, but east coast menhaden landings and canned tuna pack set new records.

As in Northwest Europe, increasing quantities are being marketed in the fresh and frozen state. In the United States both the volume and variety of frozen packaged fish are showing a marked increase. Imports of frozen ground-fish fillets into the United States which, because of a weakening of the market, declined from 24,600 metric tons in 1946 to 16,800 tons in 1947, are again on the upswing, and 11,500 tons were imported in the first six months of 1948. An important development has been the introduction of refrigerated carriers which operate between shore plants and fishing craft in distant waters. As an illustration, Pacific Coast purse seiners are now operating in Central American waters whereas formerly their operations were limited to fishing grounds near shore installations.

The 1948 landings in Canada up to the end of June reached about 247,000 metric tons as compared with 184,000 tons in the same period of 1947. Compared with 1947, a larger proportion of cod and haddock is being marketed in the fresh and frozen state, and less is being converted to the salted product.

Latin America

Current statistical information is not sufficient to permit a proper evaluation of the fisheries of Latin America. Most of the Caribbean Islands and some of the mainland countries normally import substantial quantities of cured fish, especially dried, salted cod, which is particularly suited to meet the need of the people for a concentrated protein food containing sodium chloride. However, many other countries of South America have substantial potential fisheries resources and these are beginning to be developed. Particularly is this true of the sardine fisheries of Venezuela and Brazil, and the tuna fisheries of Peru and Costa Rica. Governments of these and other countries are showing a keen interest in the further development of their fisheries, and considerable progress can be expected in the next few years. As an example, the production of Venezuela has increased from 28,000 metric tons in 1945 to 41,000 tons in 1947.

Africa

With a few exceptions, notably French Morocco and the Union of South Africa, fisheries remain largely undeveloped on a commercial scale. In South Africa the Government has encouraged the further development of its fisheries, and both the fleet and processing facilities have shown considerable expansion in the past few years. Under the stimulus of the Government-sponsored Fisheries Development Corporation, and through investments by private industry, the production of canned fish and fish

meal and oil has expanded rapidly. For instance, landings of trawler-caught fish increased from 18,000 metric tons in 1938 to about 30,000 tons in 1947, and canned fish production, apart from canned crawfish, has increased from some 200 tons to over 7,000 tons. Further development can be expected in this area.

Oceania

In Australia attention is being directed to the development of offshore pelagic fisheries and, in addition to the extension of Danish seining operations, a number of large boats capable of handling purse seine nets have been constructed. The increased production of pelagic fish will have the effect of reducing the need for imports of canned fish, which prior to the war approached 20,000 metric tons. In New Zealand, despite investment in larger and more powerful fishing boats and modernized equipment, the per unit yield has not increased proportionately and efforts are now being directed towards the conservation of resources. A survey of the territorial waters of Papua-New Guinea is now being carried out with a view to the location of new fishing grounds, accompanied by improvements in native methods of catching and preservation of their fish catches.

Far East

It is estimated that in prewar years the fish catch of the Far East, including Japan, accounted for about one-quarter of the world's supply. In most of the countries of this area fish makes up a large part of the total animal protein intake. Fresh and brackish water fisheries in countries such as China and Siam constitute an important source of supply.

The Far Eastern countries are keenly interested in the further development of this important food resource and, at the fisheries meeting sponsored by FAO[1] and held in the Philippine Republic in February of this year, agreed on the establishment of an Indo-Pacific Fisheries Council with the aim, through co-ordinated action, of development and proper utilization of the fishery resources of this area. In some countries such as China, India, and the Philippines long-term programs have been initiated for the training of fishermen in mechanized fishing and the building-up of mechanized fishing fleets for the exploitation of offshore fisheries. One of the limitations is the lack of trained fishery personnel. However, it is felt that fish supplies can be expanded materially through a further development of Eastern methods of catching and processing and the adaption to them of Western technology where appropriate and advisable.

According to reports supplied by SCAP, in the area now authorized for fishing by the Japanese the production averaged 3.3 million metric tons annually prewar (1930-34), compared with a Japanese fish production of about 2.5 million tons in 1947 and about 3.2 million tons in 1946. The decline in 1947 has been attributed to a shortage of fishing materials despite a considerable increase in imports of these materials by SCAP. Production in 1948 will depend primarily on the amount of cotton, hard fibers, and fuel oil which can be imported for the Japanese fisheries. If the supplies are adequate, a production of some 3 million tons is expected. Prior to World War II exports of fish products from Japan totaled approximately U. S. $40,000,000 per year. Because of the critical food shortage in Japan, exports in 1947 were limited to certain luxury-type aquatic products. Present indications are that the 1948 export of marine products will

[1] FAO, *Report of the FAO Fisheries Conference* (P48/Co. 1/27), Washington, U.S.A., 6 March 1948.

be somewhat greater than in 1947. Japanese prewar fish consumption was 34.4 kilograms per caput. It is estimated that consumption in 1949/50 will be about 31 kilograms.

World-wide Trade Trends

It is evident from developments in various parts of the world that a change in emphasis on the processing methods is taking place. Relatively speaking, more fisheries products are being marketed fresh, frozen, or canned and a smaller quantity is being salted and dried. For the world at large, the quantity of canned products is increasing. Production of oil and meal is approaching the prewar level.

Postwar trade statistics are available for eight of the major fisheries countries, representing an important part of the total world trade in fisheries products. For these countries, the exports of fresh and frozen fisheries products increased from 298,000 metric tons in 1938 to 367,000 tons in 1946 and 412,000 tons in 1947. For the same countries the total exports of salted and dried fish went down from 345,000 tons in 1938 to 312,000 tons in 1946 and 314,000 tons in 1947. Canned fisheries products amounted to 137,000 tons in 1938 and increased to 190,000 tons in 1946 and 208,000 tons in 1947.

This switch to fresh, frozen, and canned products could not, however, be carried through very speedily in all countries, for it means a change in consumers' habits and the establishment of proper transportation and distribution facilities. Moreover, the frozen fisheries products are relatively high in price. As total landings increased during the postwar years, a great part of the landings therefore had to be processed in the traditional way.

The figures in Table 78 for exports of herring products, salted cod and related species, and canned fisheries products indicate the trend in some countries.

The world landings of herring, which in 1947 approached the prewar landings, continued to be utilized in approximately the same way as before the war. However, in some countries some switch to fresh and frozen products is apparent; for example, in 1946 Canada exported about 42,000 metric tons of fresh and frozen herring, compared with only 11,000 tons as an average for 1934-38.

For most countries which traditionally have been canning fish the postwar quantities of canned fish did not change very much when comparing 1946 and 1947 with the prewar average. Canada and the United States account for most of the recorded increase in total world production of canned fisheries products. These countries and Denmark, the Netherlands, and Sweden, where canned fish production also increased but remained relatively unimportant, are the only countries for which definite information is available on the extent of the canning industry. However, it is known that canning plants have been established in several other countries during and since the war, and it is to be expected that complete figures would show considerable increases during the last years over and above the increase indicated here.

The total production of fish oil, excluding whale oil, is recorded for five of the most important producing countries. Their total production in 1947 amounted to 228,000 metric tons, which is slightly below the 1946 production and about 50,000 tons lower than the 1938 and 1939 production. When splitting this production into two groups (herring oil and all other fish oil), it is found that postwar production of oil other than herring is slightly in excess of the prewar production, whereas the production of herring oil is still lagging. However, extremely favorable winter herring fisheries in Norway and Iceland contributed to an increase in the herring oil production of 1948.

For five important producing countries it has been possible to record the fish meal production. In 1947, it amounted to 271,000 metric tons, compared with about 340,000 tons in 1938 and 1939. Most of the difference is due to a reduced production of herring meal, which amounted to 209,000 tons in 1947, compared with 270,000 tons in 1938. Herring-meal production in 1948 is expected to be considerably higher than in the previous year.

TABLE 78.—EXPORTS OF SOME FISHERIES PRODUCTS FROM SELECTED COUNTRIES, 1934–38, 1946, AND 1947

Commodity and Country	1934–38	1946	1947
	(*Metric tons*)		
Herring (excluding canned)			
Canada			
Fresh and frozen	11,139	41,863	33,953
Salted, dried, smoked, etc	17,242	14,541	9,548
TOTAL	28,381	56,404	43,501
Iceland			
Fresh and frozen	358	48	867
Salted, dried, smoked, etc	22,937	15,866	5,663
TOTAL	23,295	15,914	6,530
Netherlands			
Fresh and frozen	16,489	3,304	6,799
Salted, dried, smoked, etc	68,359	14,670	48,772
TOTAL	84,848	17,974	55,571
Newfoundland [1]			
Fresh and frozen	635	251	317
Salted, dried, smoked, etc	3,405	30,022	15,067
TOTAL	4,040	30,273	15,384
Norway			
Fresh and frozen	91,328	55,827	85,389
Salted, dried, smoked, etc	43,046	101,384	92,873
TOTAL	134,374	157,211	178,262
Sweden			
Fresh and frozen	15,594	2,682	1,155
Salted, dried, smoked, etc	3,185	17,761	7,990
TOTAL	18,779	20,443	9,145
Salted cod and related species			
Canada	19,698	15,433	17,856
Faroe Islands	15,489	7,000	22,401
Iceland	44,903	10,924	26,630
Newfoundland	[2] 58,089	56,648	43,457
Norway	40,584	51,743	55,346
Canned fish and shellfish			
Canada	28,239	39,531	39,891
Denmark	[3] 244	251	1,489
Netherlands	491	1,359	6,493
Norway	32,084	26,037	33,809
Portugal	40,242	46,421	37,825
Sweden	754	2,487	2,533
United States	40,386	72,888	83,275

SOURCE: Figures for 1946 and 1947 from *Reports of Newfoundland Fisheries Board*, St. Johns.
[1] Four-year average, 1936–1939.
[2] Four-year average, 1935–1938 for wet-salted.
[3] Four-year average.

Whaling

Fats and oils continue in short supply throughout the world and prices have remained high. Consequently profits from whaling also have continued high; whaling activities increased during the year.

New shore stations were established in various parts of the world, but by far the greatest activity continued in the Antarctic. In this region 17 floating factory ships with 162 whale-catcher boats and 3 shore stations with 22 catcher boats caught and processed 17,500 blue-whale units,[2] of which 16,286 blue-whale units were processed by floating factories by 31 March, this being the earliest closure of the whale fisheries to date. The quantity caught was slightly in excess of the quota allowed by the International Agreement for pelagic whale in the Antarctic. New, highly efficient catching and processing units are being prepared for next season.

If the present catch limit is continued, the production of whale oil from the Antarctic region will not be appreciably increased. There is a tendency, however, to use more and more of the whale meat and whale oil for human food.

The average catch of whales and production of whale oil as well as the operating units for the four prewar whaling seasons 1936/37 to 1939/40 are compared with the postwar years in Table 79.

TABLE 79.—WHALING, SELECTED PERIODS, 1936–1948

Period	Factory Ships	Shore Stations	Catcher Boats	Whales Caught	Oil
	(*Number*)				(*Metric tons*)
Average 1936–40	35	19	655	45,990	524,502
1945/46	9	3	93	13,381	139,003
1946/47	15	3	147	25,596	328,862
1947/48	17	3	184	31,179	353,097

Outlook

Present signs point to a higher world level of fisheries production and a more complete utilization of the catches than has existed. It is probable that in the absence of relatively adverse economic conditions the trend towards mechanization and expansion which is evident in some countries will spread to others.

Increase in production, if it occurs, will not so much be due to the increased productivity of certain areas which were not fished during the war, but rather to the increased fishing effort in areas that were little used in the past—for example, the western and central Pacific Ocean and the waters adjacent to Latin America. The increased interest in fish farming and pond culture will tend to further increase total production. Nations also recognize that, in exploiting the resources of the sea, sources of food can be tapped without any encroachment upon the living space of man himself, and that no husbandry is necessary, which in itself is an incentive in the face of expanding populations.

There is already evidence of competition in fishing, between nations, in waters of the high seas that have not been subject to sovereign rule or regulation. Governments

[2] One blue-whale unit equals 1 blue whale, 2 fin whales, 2½ humpback whales, and 6 sei whales. These are considered to be roughly equivalent in the production of oil. An approximate limit has been placed by international agreement on the production of whale oil, but not on the number of whales taken, as the proportions of the species taken vary in different seasons.

are turning their attention to the protection of their interests in these areas. In some cases this takes the form of the assertion of an exclusive right to regulate fishing of their own and other nationals in waters of the high seas contiguous to their shores.

Many of the resources in these waters may be exhaustible, and it is likely that unregulated competition between nations for them will lead to commercial failure. On the other hand, some of the living resources may not be so affected, and in others the yield might actually be increased by more intensive fishing.

The prime requisite in this situation is some form of agreement between interested nations to co-operate in a research for the facts and to regulate their behavior towards the exploitation of these resources in accordance therewith. Certain nations are conducting work towards getting these facts, and examples of such agreements exist;[3] while many of them may be held to be insufficiently effective, they illustrate the acceptance of the concept that the assertion of "rights" should not be divorced from the acceptance of "duties." But many areas of the high seas and many important species are not covered by any such fisheries agreements, and awakening interest and increasing fishing effort in them call for this kind of attention.

The attempt on the part of many nations to make more of their fisheries and to develop latent aquatic resources in the light of chronic food shortages has re-emphasized the shortage of trained personnel. This illustrates not only a failure of educational institutions to cope adequately with the growing needs, but also the failure to provide sufficient incentive, both tangible and intangible, to prospective workers. There is a great need for a re-examination of the fisheries educational problem, such as has occurred in agricultural education, to provide a sound basis for future progress in this respect.

From a sociological point of view, the mechanization of the fisheries industry implies significant changes which have to be taken into account. As long as the fisheries industry is in a primitive stage, the small capital equipment which is needed is in most cases owned by the fishermen themselves. Further mechanization usually means a higher degree of capitalization, which most fishermen cannot afford. There is therefore a tendency to concentration of capital in large firms. This process might very suddenly change the status of the fisherman to that of an employee in an enterprise over which he has no control.

Cognizance of this fact has encouraged several governments to aid the fishermen in financing a modernized industry or in developing co-operative arrangements. As the fisheries industry becomes mechanized and highly capitalized, it becomes more important to keep the producing units as permanently employed as possible. From one angle this need is dictated by competition, since permanent operations reduce the overhead costs per unit. From another angle it must be recognized that mechanized fishing means a decreasing combination of fishing and farming or other activities ashore. Possibilities for such still exist in many countries, but the tendency away from this combination seems to be evident.

In this way the industry becomes much more vulnerable than in the primitive way of fishing. When successful, mechanized fisheries will give the people employed a higher standard of living; but when reverses are encountered, distress will be more acute.

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[3] Whaling Convention, International Fur Seal Convention, Pacific Halibut Convention, Pacific Salmon Convention, North Sea Convention, Baltic Convention, Skagerrak-Kattegat Convention.

Chapter 15

FOREST PRODUCTS

A RECENT appraisal undertaken by FAO in connection with the publication of the first yearbook of forest products[1] places world output of wood in 1946 at 1,000 million metric tons and the approximate value of primary forest products at U. S. $14,000 million. By weight, wood production continues to be second only to coal. By value, annual output of the forest equals 20-25 percent of the world's food production.

Incomplete statistics make it almost impossible to determine accurately the year-to-year changes in world output. It appears, however, that world supplies of wood probably rose 5 percent between 1945 and 1946, yet in the latter year remained some 6 percent below prewar. In view of further rises during 1947 and 1948 in Europe and North America, it is safe to assume that by now the world production of wood is equal, or even slightly superior, to the prewar average.

Total wood output was broken down in 1946 by principal categories as follows:

Category	*Percentage*
Sawlogs and veneer logs	41
Pulpwood	13
Pitprops	3
Sleepers	4
Fuelwood and all other wood	39

These figures are based on reports from countries accounting for not quite half the world's production. More complete information would probably reveal that fuelwood still represents 50 percent or more of total forest output. Indeed, fuelwood consumption had a comeback during the war and early postwar years, especially in Europe where many countries had to offset serious shortages of coal and oil by burning huge amounts of wood. By now, 1948 fuelwood consumption, even in war-affected areas, is back to where it was before the war and the downward trend in consumption of this least valuable of all forest products is likely to be resumed.

Aside from its use as fuel, wood has served mainly as a structural material in building or for packaging. These uses continue to be the predominant commercial outlets for wood, not only in its traditional form as lumber but in more modern and better processed forms, such as plywood, fiberboard, and even plastics. So far, many of these new forms are too small to show up in world statistics.

[1] FAO, *Yearbook of Forest Products Statistics—1947,* Washington, U. S. A., 1948.

The most important shift in the structure of wood uses by categories is caused by the growth of an increasing number of chemical wood industries, converting not only pulpwood but waste wood from the forests and from sawmills. Prior to the war, pulp industries absorbed 7 percent of annual forest output. It is fair to estimate the present share of pulpwood at about 9 percent of the total wood cut.

The trend towards increased pulp production at the expense of lumber and fuelwood is likely to continue. It finds its most significant expression in a gradual change in the price relationship between sawlogs and pulpwood. Sawlogs have always brought a higher price than pulpwood; in recent years, however, the difference has become smaller and smaller. If the growth in demand for pulp products continues, the tendency for diversion to pulp mills of wood that otherwise would be sawn into lumber will also increase. The competition between lumber and pulp users for raw materials has become a significant factor in the European situation. It has aggravated the shortage of lumber for reconstruction needs and has even interfered with adequate supplies of pitprops to meet the needs of increasing coal production. In the Scandinavian countries, in particular, there is a strong tendency to divert as much roundwood as possible to pulp, which can be sold for much needed dollars to the United States, while lumber and pitprops can only be exported to Europe for softer currencies. Irrespective of this temporary situation, there are permanent factors favoring pulp industries in competition with other users of the same raw material, in particular the fact that a cubic meter of wood when converted into pulp is worth more than twice as much as the same cubic meter converted into lumber and almost three times as much as when it is sold as pitprops or railway sleepers.

The shifts in the relative importance of different forest products are not equally noticeable in all parts of the world. The decline of fuelwood begins only when a country develops sawmill industries on a fairly large scale and this has not yet happened in large parts of the Far East, Africa, and even in certain Latin-American countries. The regression of lumber in favor of pulp is likewise confined mainly to Scandinavia and North America, where 82 percent of the world's pulp is produced.

Progress in industrial methods, which is among the principal goals of FAO and other United Nations agencies, will accentuate the trends just mentioned and spread them gradually to all regions of the world. That same progress will result in a substantial rise in the world's need for wood in all its forms. Even where forest resources are large, the wood consumption of the world's less developed regions and countries is still very low. Improved housing, progress in literacy, and larger consumption of the goods that are wrapped in pulp products or crated in wood will only be possible when more lumber, pulp, building boards, and rayon fiber can be made available not merely for one-third but all the world's people. Therefore, FAO's foremost task in the field of forestry and forest products is to plan and promote increased wood production on all continents.

Sawn Lumber[2]

The world's lumber production in 1946 is estimated to have been 41 million standards, corresponding to 320 million m^3 of roundwood. Of this, more than three-quarters was softwood.

[2] Excluding railway sleepers.

During the first postwar year world lumber production showed a remarkable recovery, rising 21 percent between 1945 and 1946. Nevertheless, lumber output in 1946 was 5 percent below the prewar average and probably remained substantially at that level in 1947. Output in 1948 shows some slight improvement but is still several percent below 1937, the best prewar year.

Requirements per unit and the number of units needed are the two main factors in lumber consumption trends. Technical advances in industrialized countries are usually accompanied by a falling rate of lumber consumption per house and per ton of goods that have to be packed. The recent war-caused shortage of wood has greatly accentuated that trend. In Britain, for instance, the amount of wood allocated to builders has now been reduced to 1.6 standards per dwelling unit, compared with a prewar average of 2.5 standards and more. In the United States, on the other hand, lumber needs continue to average 5 standards per dwelling unit. The same is true for many European countries. However, the FAO/ECE Timber Committee for Europe has started a special investigation of possible economies in the use of wood and by this means expects to produce recommendations that can further diminish wood consumption per unit of use.

The trend toward smaller lumber requirements per unit is more than offset by increases in the number of units—houses, packaging cases, railway cars, etc.—for which lumber is needed. A recent estimate by the Housing Panel of the ECE, which covers 14 countries containing about 40 percent of Europe's population, produced the following illustration of present and prospective housing needs:

Period	*Volume of Construction in 14 European Countries (1,000 dwelling units)*
Prewar, annually	600
Planned for 1948	660
Necessary program—1948-52, annually	1,600-1,700
Desirable program—1948-52, annually	3,700

Likewise, in the United States present housing programs anticipate an average annual construction of 1.25 million to 1.5 million dwelling units for the next ten years, requiring each year 5 to 7 million standards of lumber.

What is true for housing is equally true for most other outlets of lumber. Hence, the lumber needs of the high-income countries are likely to rise at least for the next five or ten years, until the housing crisis and other pent-up demands have been met. If these countries can maintain reasonably full employment and achieve progressively rising national incomes and living standards, the high level of lumber consumption is likely to continue; otherwise, a decline of lumber consumption in Europe and North America, after completion of the present housing programs, is possible.

This possibility does not exist in the low-income countries. There is an extraordinary discrepancy in lumber consumption levels between high-income and low-income countries. Inhabited by less than one and one-third of the world's population, Europe, the U.S.S.R., North America, and Oceania consume over 80 percent of the world's lumber output. The 1,500 million people of Asia, Africa, and Latin America have a total annual consumption of only 4.75 million standards, which is less than 8 kilograms per person compared with 150 kilograms in the high-income countries. The additional needs for lumber which will accompany industrialization and rising incomes in the world's less advanced regions are beyond measure.

Although close to 8 percent of world lumber production enters international trade, most of this trade takes place within each of the world's two principal lumber-consuming regions. Lumber is a very bulky commodity. Even at the present price level, it has a wholesale value of only 6 U. S. cents per kilogram. Therefore, separate consideration is given here to the lumber problems of three groups of countries: Europe, including the Near East and the U.S.S.R.; North America, excluding Mexico; and the rest of the world.

Europe, including U. S. S. R. and Near East

Before the war Europe's lumber consumption was estimated at around 13 to 14 million standards (approximately 36 million tons). Of these, 90 percent were sawn softwoods. Table 80 shows the structural changes in the pattern of European softwood trade which have taken place since then and their effects on the softwood consumption of this region.

In 1947 consumption of softwood lumber in Europe (excluding the U.S.S.R.) was 30 percent lower than that of ten years earlier. The entire reduction was borne by the timber-importing countries, the timber imports of the United Kingdom amounting to only 60 percent and those of central and southern Europe to only 33 percent of the prewar quantities.

The shortage results from a heavy drop in supplies from all of Europe's traditional sources of softwood imports. Most significant in that connection is the disappearance

TABLE 80.—EUROPEAN OUTPUT, TRADE, AND CONSUMPTION OF SOFTWOOD, 1937 AND 1947

Area	1937			1947			
	Output	Net Trade (Imports+ Exports−)	Available for Consumption	Output	Net Trade (Imports+ Exports−)	Available for Consumption	Consumption in 1947 as Percentage of 1937
	(*Thousand standards*)						(*Percentage*)
Western Europe [1]	665	+3,379	4,044	863	+2,014	2,877	71
Germany	[2] 1,084	+ 731	1,815	[2] 1,132	− [2] 616	[2] 516	...
Central and southern European countries (importing) [3]	381	+ 620	1,001	533	+ 206	739	74
Scandinavia [4]	3,245	−1,916	1,329	2,185	−1,097	1,088	100
Central and southern European countries (exporting) [5]	2,935	−1,377	1,558	1,937	−319	1,618	104
TOTAL EUROPE (excl. U.S.S.R.)	8,310	+1,437	9,747	6,650	+ 188	6,838	70
U. S. S. R.	7,250	−1,362	5,888	[6] 6,000	− 30	5,970	...
TOTAL EUROPE (incl. U. S. S. R.)	15,560	+ 75	15,635	12,650	+ 158	12,808	...

[1] Belgium, Luxemburg, Netherlands, France, Denmark, and the British Isles.

[2] Three western zones only.

[3] Switzerland, Hungary, Italy, Greece, and Turkey.

[4] Norway, Sweden, and Finland.

[5] Yugoslavia, Rumania, Bulgaria, Poland, Czechoslovakia. Austria. and Portugal.

[6] Estimate.

of the U.S.S.R. as a timber exporter, as prior to the war it contributed from its present borders over 30 percent of all exports. Simultaneously, softwood exports from Scandinavia and central Europe declined by 60 percent from 3.2 million to 1.2 million standards. The only major offsetting factors were Germany and North America. Prior to the war, Germany had been a large timber importer, but in 1947 it exported close to 65,000 standards of sawn softwoods and, in addition to that, sawlogs which the importing countries were able to convert into 550,000 standards of sawn lumber. North American exports to Europe, on the other hand, totaled in 1947 close to 875,000 standards, a 41 percent increase over prewar exports.

To alleviate the alarming timber situation, the International Timber Conference held at Marianske Lazne in May 1947 was able to agree on a number of measures which, as far as the short term is concerned, have since then been taken up by the FAO/ECE Timber Committee in Geneva. Constituted originally as a subcommittee of the Industries and Materials Committee of ECE, this body has now been given the status of a full committee. Its terms of reference provide that it should pay attention primarily to:

(1) increasing available timber supplies and decreasing waste of wood in order to help meet the needs of European reconstruction;

(2) aiding in reducing economic difficulties mentioned in the resolution on increased production by certain countries, by assisting them in obtaining necessary economic help; and

(3) improving the distribution of available timber supplies.

In three sessions the Committee has been able to secure significant progress in each of these fields.

Compared with the timber situation in 1946, the first signs of improvement could already be noticed in 1947. European softwood imports from all sources reached 2.7 million standards, which was 1 million standards more than in 1946. On the other hand, it was found that urgent requirements were substantially below the Marianske Lazne estimate of 4.2 million standards, first, because reconstruction activities were limited by lack of manpower, plumbing, glass, and other building materials than wood, and, second, because the general pace of European recovery slowed down toward the end of the year. An additional cause for low softwood consumption was the control of timber consumption imposed in many countries. In the case of Great Britain this control was so severe that timber stocks in that country rose between 1 January 1947 and 1 January 1948 from 215,000 to 616,000 standards, a figure which corresponds to the level of British stocks of prewar years at a time when annual consumption was twice as high as it is now.

In 1948 export supplies available to Europe are estimated at 2.50 to 2.75 million standards, an amount which comes close to the 1947 figure. At the June 1948 session of the FAO/ECE Timber Committee the importing countries indicated that their effective demand would not exceed 2.73 million standards, and accepted for their timber purchases in 1948 buying limits corresponding to these estimates.

Reduced consumption in 1948 must be attributed to the same causes as in 1947. Moreover, the improved stock position in the United Kingdom and most other importing nations of Europe will help these countries meet unexpected emergencies without an immediate increase in imports.

The outlook for the future is far from encouraging. Actual import needs remain high and tend to increase the longer the filling of these needs is postponed. On the

other hand, it is expected that the European Recovery Program will generally improve economic conditions in western and southern Europe and that effective demand will then come close to the import needs put forward by the Paris Conference of the 16 nations—3 million standards for 1948 and a rise to 4 million standards by 1951.

There is no prospect of a corresponding increase in exportable supplies to meet such a rising demand; indeed, there are indications of a substantial reduction. Shortages of timber may become an increasingly serious obstacle to European reconstruction and in many respects might even endanger the objectives of the European Recovery Program.

In 1949 Germany's exports will either come to a standstill or at best be a fraction of the 616,000 standards of lumber and roundwood exported in 1947. This is the inevitable result of the new policy designed to conserve Germany's forest resources and to speed up the reconstruction of western Germany. Within the near future, Germany may again become a timber importer.

Scandinavian softwood exports are also likely to decline. The forest owner has a price incentive to send his logs to the pulp industry rather than to sawmills, and the Governments of Sweden and Finland are bound to encourage this trend, as it helps to secure much needed dollars.

Last June it was announced that the United States and Canada were ready to export 700,000 standards of softwood to Europe annually. The dollar shortage of European importers is such, however, that they do not expect to buy more than 400,000 standards from North America this year. Actual imports from North America during the first six months of 1948 have been at an even lower annual rate, totaling only 150,000 standards.

In recent months, American prices for all commodities have risen so much that a revision of all the original European Recovery Program estimates has become necessary. As a result of this, the committees working in Paris have been compelled to reallocate the available credit, diverting some of the money originally set aside for timber to other even more urgent purchases in the Western Hemisphere and to curtail their timber import program from North America accordingly.

The combined result of these developments is a reduction of Europe's prospective softwood imports ranging between 1 million and 1.2 million standards below those of 1947. Since there are no indications of an impending large-scale resumption of U.S.S.R. exports or any reason to anticipate a substantial change in central European exports in the normal course of events, the total softwood likely to be available to Europe and the Mediterranean area in 1949 and after threatens to fall to 2 million standards, a figure which represents 50-65 percent of the estimated effective demand of 3.5-4 million standards for that period.

Intergovernmental co-operation has brought about increases in timber production. Early in 1948 the Coal Committee of ECE, acting upon the recommendation of the FAO/ECE Timber Committee, allocated an additional amount of coke to Sweden, enabling that country to pledge for 1948 an increase in exports of 100,000 standards of softwood and 30,000 m^3 of pitprops. Similar arrangements are contemplated for the coming year.

There are possibilities of increased supplies from other European exporting nations. Finland, Poland, Czechoslovakia, Austria, and Yugoslavia have indicated that they would be able over a period of two years to supply European markets with 700,000 standards of additional timber, representing a value of roughly 110 million U. S. dollars, if they were given credits amounting to 16 million U. S. dollars. Half of this would represent equipment to be paid for in dollars, for which a loan has been requested from the

International Bank for Reconstruction and Development; the other half would represent equipment to be obtained from, and financed by, western European countries.

Since February 1948 this proposal has been under active consideration by the International Bank for Reconstruction and Development in co-operation with FAO and ECE. A meeting of the majority of the European timber-exporting and -importing countries is scheduled to open in Geneva in September 1948 to discuss the proposals further; a representative of the Bank will be present.

If the proposed measures can be put into effect, total softwood exports between 1949 and 1951 from European sources may average 1.5 million standards annually. Since this figure represents less than half the effective import demand anticipated for these years, it will be necessary for European countries to attach substantially larger dollar amounts to timber purchases from North America than during the current year. They will also have to renew their efforts to obtain substantial timber supplies from the U.S.S.R.

If all these measures should succeed simultaneously, supplies available to Europe would approximate 3 million standards, an amount which would be 10 percent more than was imported by Europe in 1947, 30 percent less than prewar imports of these countries, and probably one-half million to 1 million standards short of effective demand.

United States and Canada

The United States and Canada produce and consume, at present, about as much lumber as the rest of the world combined. In 1947 their lumber production amounted to almost 22 million standards (softwood and hardwood), or close to 50 percent of estimated world production. Prior to the war the corresponding percentage ranged between 35 and 40 percent. Although the region as a whole is a net exporter of lumber, over 92 percent of the 1947 production of Canada and the United States was consumed within the region. North American lumber consumption per caput is the highest in the world—300 kilograms per caput per year as against 50 kilograms for the world average.

The lumber consumption of the United States is characterized by extreme fluctuations. In 1932 it reached an all-time low with 7.5 million standards, while during the latter part of the 1930's it averaged 12 million standards. Even present United States consumption of 18 million standards is 10 percent below the record consumption of 1924-1926, but according to estimates of the United States Department of Agriculture this record will be matched and even surpassed in the near future. A careful appraisal of prospective lumber needs places consumption between 1950 and 1955 at an average of 21.25 million standards, broken down as follows:

Type of Consumption	*Million Standards*
Construction (urban and rural)	15.75
Packaging	3
Furniture and other manufacturing	2.50
Total	21.25

In 1948 North American lumber production and consumption were in line with expectations and thus slightly higher than in 1947. Requirements for building and other uses continue to run high, but the urgency of demand is definitely less great than during the immediate postwar period.

North American lumber stocks at mills and with retailers usually represent 3 to 4 months' production. In 1946 stocks had fallen to less than 2 months' production, but in

the last 18 months they have been building up from 2.7 million to almost 5 million standards, which can be regarded as normal.

U. S. lumber prices have risen far higher than those of any other building material. The lumber price index at the end of the war is indicated in Table 81.

TABLE 81.—PRICE INDICES OF BUILDING MATERIALS IN THE UNITED STATES, 1946, 1947, AND 1948

Period	Lumber (Composite)	All Commodities	All Building Materials	Cement	Structural Steel
	(*Index: 1939=100*)				
Yearly average					
1946	191.1	157.1	146.5	114.0	110.3
Quarterly averages					
1947, First	280.0	188.3	192.3	120.7	119.0
1948, First	327.3	210.8	213.1	139.1	139.2
Monthly averages					
January 1948	329.7	214.8	213.4	138.4	133.3
May 1948	335.7	212.5	216.9	140.4	142.9

SOURCE: U. S. Department of Commerce, *Lumber Industry Report*, Washington, June 1948, p. 8.

As a result of this exceptional price rise, the competitive position of lumber with other building materials has greatly deteriorated and this in turn may result in substitution and a corresponding reduction of lumber requirements below earlier estimates. Even at present, despite high consumption, American lumber markets show a slightly weakening tendency for certain specifications.

Although North American lumber exports are small compared with the region's own consumption, their role in wood trade is very noticeable. Prior to the war combined softwood exports from the United States and Canada amounted to 1.5 million standards compared with 4.6 million standards of exports from Europe, including the U.S.S.R. In 1947, however, North American exports of 1.8 million standards were just about equal to total European exports (including the lumber equivalent of the German shipments of sawlogs).

In 1948 the position would be substantially the same if dollar shortages had not interfered with North American timber sales. European countries may be able to buy only half the lumber which North American exporters would be prepared to supply. The same is true to a lesser degree of the Far East, Latin America, and the Union of South Africa, which usually take more than half the lumber exported by the United States.

Other Regions

Only 10 percent of the world's lumber is produced and consumed outside Europe and North America. In the rest of the world lumber is still mainly a local commodity produced not by sawmill industry, as in the more advanced countries, but by very small units which cut up logs mainly for consumption nearby.

There are some exceptions to this rule. Japan, for instance, has had a large lumber industry and a fairly high degree of lumber consumption for some time. In Brazil and a few other Latin-American countries a lumber industry is being built

up and has started the sawing of logs for exports to neighboring countries and even to Europe. In New Zealand, increasing amounts of sawlogs are harvested every year from large pine plantations and are converted in modern installations into lumber for domestic use and for export to Australia.

While more such illustrations could be cited, it remains generally true that in all these regions lumber production is still in a very early stage of development and that lumber trade and industry have not yet reached a stage of organization which permits a discussion in general economic terms.

Although Latin America has larger forest resources than any land area of comparable size in the world, the region as a whole has been, until recently, a net importer of lumber. Also, the more advanced parts of Africa, the Pacific area, and Asia have been accustomed to rely mainly on Europe and North America for their lumber supplies, despite the fact that large and sometimes excellent forests are located much nearer.

The present world lumber shortage in Europe and the fact that lumber imports from the United States and Canada call for dollars which are not easily available have greatly curtailed the lumber supplies of the principal importing countries in Africa, Latin America, and the Pacific area. They are still receiving some lumber from Europe and North America, but total 1947 lumber imports of the countries in the Pacific area were 50 percent smaller than those of ten years earlier. African and Latin-American countries are retarded in their industrial development by the lack of lumber. All these countries realize now that they should come to rely on more nearby sources for their growing lumber needs and are taking measures accordingly.

Pulp and Paper

The world production of wood pulp in 1946 was estimated to be 24.3 million metric tons, or 2 percent greater than output in 1937. During the decade the combined production of Canada and the United States increased from 10.6 million to 15.6 million metric tons; significant increases took place in Latin America and in Australia. On the other hand, the combined production of Sweden and Finland, the principal producers of Europe, fell from 5.8 million to 3.9 million metric tons. At the same time, production in Germany and Japan, formerly important producers of pulp and pulp products, fell to a fraction of its former volume.

FAO has received official statistics covering 20.7 million metric tons of the 1946 production of wood pulp. Of the quantity reported, 34 percent was classed as mechanical pulp and 62 percent as chemical pulp. Reported production was distributed by regions as follows:

Region	*Million metric tons*	*Percentage*
Europe	4.7	22.7
North America	15.7	75.8
South and East Asia	0.2	1.0
Oceania	0.1	0.5
Total	20.7	100.0

The additional 3.6 million metric tons not reported is estimated to cover the output of the U.S.S.R., Germany, several countries in South and East Europe, Latin America, and India. Total consumption of pulp and pulp products reported to FAO amounted to 19.6 million metric tons and was distributed in 1946 as follows:

Region	*Million metric tons*	*Percentage*
North America	15.6	79.7
Europe	3.3	16.8
Near East	0.1	0.5
South and East Asia	0.3	1.5
Oceania	0.3	1.5
Total	19.6	100.0

Three countries—the United States, the United Kingdom, and Canada—consumed more than two-thirds of the estimated total world ouput in 1946. The United States alone consumed 59 percent.

Consumption of pulp and pulp products per caput was only slightly lower in 1946 than in 1937 for the world as a whole. On the other hand, the distribution of that consumption by regions had altered radically. Consumption in the United States increased from 81 kilograms per caput to 102 kilograms, while that of the reporting countries in Europe fell from 34 to 21 kilograms. Even within Europe there were great differences between individual countries. Sweden and Finland, being large producers, were able to increase their domestic consumption, whereas severe reductions were the rule in most of the other countries. For example, consumption in the United Kingdom fell from 64 to 24 kilograms, and that of France fell from 24 to 14 kilograms.

Since pulp products include most of the paper needed for the distribution of news and other information, packaging materials required to protect the products of industry, the raw material for the manufacture of rayon, and fiberboards needed for building, the shortages experienced within those countries of Europe that suffered war devastation constitute a serious handicap to political, economic, and physical reconstruction.

The existing demand for pulp in hard currency countries, together with high prices, has stimulated the installation of new production facilities in North America, and considerable interest is being shown in the possibilities for expanding production in Latin America and introducing the pulp and paper industry into Africa and Alaska. Plans for the expansion of production in India and elsewhere have also been reported. To a considerable degree the present distribution of production and consumption must be regarded as artificial, and therefore temporary, and it seems necessary to view plans for radical increases in productive capacity with considerable caution until the probable trends of demand in the immediate future can be more clearly defined. Certain countries of northern Europe have found that their installed capacity is, when reviewed in light of wood requirements for other uses, in some places greater than the sustained yield capacity of the forest on which it must depend. For this reason, certain pulp mills have been sold outright and will be moved to other countries where more extensive forest resources are available.

Pitprops

It has been estimated that under normal conditions world consumption of pitprops is of the order of 30 million $m^3(r)$ annually. As an adequate supply of pitprops is essential for the mining of coal, the importance of the pitprop to the general economy is far greater than the relatively small volume of annual consumption may suggest.

Since the value per unit of volume is relatively low, the trade in pitprops is essentially local and some of the principal coal-producing countries, such as the United States and the U.S.S.R., are self-sufficient. Taken as a whole, Europe is also self-sufficient, as the needs of countries which are large producers of coal but which possess relatively small forest resources are met through intra-European trade. The single exception to this situation occurs in the case of the United Kingdom, which secured more than 1 million $m^3(r)$ of pitprops from Canada in 1946.

Finland is the largest exporter of pitprops in the world, and in 1946 provided other countries with 1,254 million $m^3(r)$, of which all but an insignificant amount went to other countries in Europe. The United Kingdom received 722,000 $m^3(r)$ of Finnish wood and Belgium imported 417,000 $m^3(r)$. Next in importance among European exporters stood Sweden, which provided 133,000 $m^3(r)$ to the United Kingdom and 97,000 $m^3(r)$ to the Netherlands. Imports by European countries from Germany during 1946 have been reported as follows:

Country	*Thousand m^3 (r)*
United Kingdom	94
Belgium	137
Netherlands	195
France	29

The countries of central Europe did not export pitprops to the West during 1946, but it is possible that severe damage caused in the forests by bark beetles will make necessary supplementary fellings which, in turn, may increase the pitprop supplies available to European mines.

The relationship existing between prices obtainable for pitprops and for pulpwood have encouraged producers to favor the latter product, since it appears to be more profitable. The question of price is particularly important in Finland, because of rising costs of production, transportation, and fuel. The northern countries desire that the price of pitprops should be fixed with that of coal. It is pointed out that, while the price of coal has risen 500 percent since 1938, the price of pitprops has risen only 300 percent.

On the whole, the pitprop supply situation in Europe is reasonably satisfactory at the present time, but if coal production is to be increased according to plan from 492 million tons in 1948 to 592 million in 1951, the supply of pitprops will have to be increased from 14.8 million $m^3(r)$ to 16.9 million $m^3(r)$. The coal-producing countries can themselves produce about 10 million $m^3(r)$ of pitprops, but the remainder will have to be imported from other European countries, the U.S.S.R., and Canada. According to present prospects, a shortage appears likely in the years to come. Among possible solutions, the FAO/ECE Timber Committee is studying the possibilities of using certain broadleaved tree species in the mines to supplement the supply of coniferous wood. If this can successfully be accomplished, it would go far to ensure adequate supplies.

Railway Sleepers

Available information does not permit an estimate of world output and consumption of sleepers. Statistics regarding this product are particularly weak, in part because some countries include production of sawn sleepers under lumber production while others do not.

Since sleepers are a heavy and bulky product and are relatively cheap, they do not ordinarily enter to a large extent into international trade. During the last three years, however, the short-term problem of restoring the damaged railways of Europe has resulted in considerable trans-Atlantic movement of sleepers.

Plywood

The total production of plywood reported to FAO for the year 1946 was 1.9 million m^3, of which 82 percent was produced in three countries—the United States (1,275,000 m^3), Canada (165,000 m^3), and Finland (140,000 m^3).

The rate of world output of plywood has increased rapidly in recent years, as has production of fiberboard. In the United States production in 1925 was only 140,000 m^3 as compared with the 1946 production stated above. In that country and in some others the greater part of plywood manufactured is made from domestic wood. In some other producing centers, however, notably in the United Kingdom, most of the plywood produced is made from imported logs. Current high prices of such logs are now forcing many countries which previously relied on imports to explore the possibilities of supplying their mills with indigenous species. A great deal of research is being done in central and western Europe looking toward the use of beech for the manufacture of plywood.

Since many species occurring in the complex forests of the tropics are known to be well adapted to the production of plywoods of high quality, it is to be expected that new plywood factories will be established in Africa, South America, and the Far East. This development would have the advantage of avoiding excessive transportation charges on raw materials.

Fiberboards

The output of fiberboards in 1947 was estimated to be 1.7 million metric tons. Of this amount Canada and the United States produced more than 70 percent and European countries about 20 percent.

Output of this category of forest products, which includes hard boards (or wallboards) and insulating boards, has expanded rapidly during the past two decades, and many new plants are under construction or are planned for erection in the near future. This trend of development is justified because current demands are far in excess of supply and because the manufacture of fiberboards provides a satisfactory means for using wood refuse from other types of manufacturing plants, such as sawmills.

At the present time, the United States is by far the greatest producer and the output in 1947 of 1.1 million metric tons was 27 percent greater than 1946 production and about double the prewar figure.

Sweden, the largest producer in Europe, manufactured 235,000 metric tons in 1947, which was also substantially above the 1946 figure and practically double

the 1939 output. Canadian output in 1947 amounted to 145,000 metric tons, and the industry is expanding at about the same rate as that of the United States. Among European countries with outputs in excess of 20,000 tons annually are Norway, Finland, and the United Kingdom, but fiberboard is manufactured in many others. Other producing countries are Japan, Australia, and New Zealand, and some small-scale production has been carried on in South America.

New mills are under construction in Czechoslovakia, England, France, Italy, Switzerland, the U.S.S.R., the Union of South Africa, and Australia, while additional projects in Latin America and central Africa are under consideration.

In addition, a number of fiberboard factories in Europe destroyed during the war are being rebuilt, and some installations removed from Germany in connection with reparations are being re-erected in other countries.

PART IV

TOOLS FOR PRODUCTION

OF PRIME importance to the recovery and expansion of food production is an adequate supply of fertilizers, agricultural machinery, pesticides, and other materials used on farms. Since the war the demand for these items has been much larger than available supplies, although in many cases, notably in fertilizers and farm machinery, present world output is much greater than prewar. In many countries agricultural programs are being held up through inability to obtain desired quantities of equipment.

These so-called "industrial bottlenecks" have been examined by the Conference and Council of FAO, and were discussed by the United Nations Economic and Social Council at its session in March 1948. At that meeting the Council passed a resolution on "Measures to meet the continuing world food crisis," which requested FAO to examine the supply situation of these various materials, in collaboration with the regional Economic Commissions and other specialized agencies. Accordingly, joint working parties have been established in the Far East between FAO and the Economic Commission for Asia and the Far East, and in Latin America between FAO and the Economic Commission for Latin America. The matter will also be reviewed in Europe by the Ad Hoc Agricultural Committee of the Economic Commission for Europe. In the light of studies made by these various bodies, FAO will be presenting a general report on the farm equipment situation to the January 1949 meeting of the Economic and Social Council.

Because the study of these questions is still in progress, it has seemed best in the present Report to give only some interim information on fertilizers and on farm machinery.

Chapter 16

FERTILIZERS

ONE of the most encouraging features of the agricultural food picture is the phenomenal increase in the utilization of chemical fertilizers as a means for raising the food output and preventing the exhaustion of soil resources.

The shortage of food has made governments anxious to produce or acquire larger supplies of fertilizers, and the favorable prices of farm products have made farmers in many countries willing and anxious to purchase much larger quantities than before the war. The agriculturally less developed countries are showing a new interest in fertilizers in connection with their food-production programs. Thus, although world production of nitrogen, phosphates, and potash is higher than prewar, a large unsatisfied demand remains.

As before the war by far the greater part of the world's fertilizer supply is produced and consumed in North America and Europe. Consumption has increased very substantially in North America, and is even above prewar in many European countries, although most of these have a reduced supply of animal manure as a result of their livestock losses. Because production of nitrogenous fertilizers is concentrated in a few industrialized countries, and because mineral deposits of phosphate rock and potash are available in comparatively few parts of the world, it follows that a large number of countries have to rely on imports for their supply. During a period of scarcity there is a natural desire on the part of exporters to ship to hard currency areas or to countries where other favorable trade arrangements can be made. In consequence, purchasers in Asia and Africa, for example, have found it difficult to obtain a reasonable proportion of their requirements. Some of these countries are planning to establish fertilizer plants; but this will take time, and meanwhile the excess of demand over available supplies is expected to continue.

The current world demand/supply position for the three major plant nutrients—nitrogen, phosphates, and potash—is discussed in the following sections.

Nitrogen

World production of nitrogen has increased steadily since the end of the war. Yet the gap between requirements and supplies remains almost as great as during the past three years. The world shortage of commercial nitrogen for the year 1948/49 will be close to a million metric tons. The following summary figures show the relative position of production and requirements for the world as a whole (exclusive of the U. S. S. R., Bulgaria, Hungary, and the U. S. S. R. Zone of Germany, for which no information is at hand) for the years 1947/48 and 1948/49:

	1947/48	1948/49
	(*Thousand metric tons N*)	
Requirements	3,620	4,061
Production	2,750	3,083
World shortage	870	978
	(*Percentage*)	
Shortage as percentage of requirements	24.2	24.1

The current demand for nitrogen is stronger than for any other fertilizer material; and even if, as a result of some recession from the present high level of farm prices, the demand were to diminish in a few countries, there would remain an increasing demand to be satisfied in the developing countries.

International allocations have been continued in spite of the marketing and distribution problems which so complicate the nitrogenous fertilizer picture. But for the allocation system, the supply difficulties of many countries would have been even greater, while larger quantities would have been shipped to the hard-currency countries and those countries which offer other commercial advantages. Indeed, so keen has been the competition for supplies that more than once during the long weeks of international negotiations it appeared unlikely that an allocation recommendation could be developed for 1948/49. The following brief notes on the situation in the various continents indicate, at least in part, the impact of the financial and marketing problems outlined in the previous paragraph.

Europe

Europe expects to produce almost 50 percent more chemical nitrogen for fertilizer in 1948/1949 than in 1946/47. In spite of this remarkable increase, due primarily to rehabilitation of war-damaged plants, the spread between demand and total supply will be even larger than it was in 1946/47. Requirements have been increasing steadily, although at a much lower rate than production, but the quantities available to Europe from other sources are decreasing as urgent demands of non-European areas are also growing.

North and South America

In the Americas, total production of nitrogen for fertilizers (including the ordnance types) has increased about 15 percent in the past two years. Nitrogen requirements and utilization are estimated to have increased about 25 and 8 percent, respectively, reflecting the desire of farmers to expand production programs. Consumption has been kept down by the system of international allocations, which has made it possible to increase exports by about 31 percent in 1948/49 as compared with 1946/47.

Asia and Africa

Great supply difficulties have been experienced during the past three years by the countries of Asia and Africa. Governments in these continents have become aware of the importance of nitrogenous fertilizers for increasing production of food, and requirements have increased steadily. Asia alone, from the point of view of crop needs, could well utilize considerably more than a million tons of nitrogen fertilizers per year. However, problems of currency and transportation, among other difficulties, have restricted consumption much below this level. But the majority of countries in Asia and Africa depend on imports for meeting their nitrogen requirements (indigenous production

TABLE 82.—SUPPLIES OF NITROGENOUS FERTILIZERS, BY CONTINENTS, PREWAR, 1946/47, 1947/48, AND 1948/49

Continent and Period	Stated Requirements	Production	Net Trade Imports (+) Exports (−)	Total Availability
	(*Thousands of metric tons (N)*)			
Europe [1]				
1938/39	.....	1,261	−111	1,150
1946/47	1,568	965	+103	1,068
1947/48	1,732	1,191	+ 93	1,284
1948/49	1,980	[2] 1,425	+ 23	[2] 1,448
North and South America				
1938/39	.....	539	− 39	500
1946/47	834.0	1,168.8	−348.4	820.4
1947/48	935.1	1,317.6	−471.9	845.7
1948/49	1,043.2	1,343.9	−457.4	886.5
Asia and Africa				
1938/39	.....	275	+465	740
1946/47	741	171	+235	406
1947/48	956	230	+364	594
1948/49	1,017	[2] 302	+386	[2] 688
Oceania				
1946/47	17.9	4.6	+ 6.8	11.4
1947/48	18.6	7.5	+ 6.9	14.4
1948/49	19.2	[2] 12.2	+ 3.5	[2] 15.7

[1] Excludes U.S.S.R., Hungary, Bulgaria, and U.S.S.R. Zone of Germany. Prewar movement from eastern to western Germany counted as "import."
[2] Preliminary figure.

is of major importance only in Japan and in the Soviet Zone of Korea), and during the present period of shortage it has been extremely difficult to find exporters willing to ship to those areas.

Oceania

While the fertilizer requirements of Oceania are small, an adequate supply of nitrogen is very necessary in Australia and New Zealand for use on sugar, roots, fruits, and other crops. Indigenous production has increased but is still insufficient for local requirements.

Phosphates

The world supply of phosphates is reported to be adequate for current demands except for countries to which special reasons apply. The prewar world consumption of soluble phosphates is estimated at 3,053,000 metric tons P_2O_5. In contrast the stated requirements for soluble phosphates for the year ending 30 June 1947 were 5,356,000 metric tons P_2O_5, against which an estimated world production of 4,281,000 metric tons was allocated.[1]

With the removal of phosphates from allocation on 30 June 1947, conditions other than availability—such as prices, financing, and other factors—came to exert a relatively stronger influence on the actual supply in any country.

[1] IEFC Recommendation No. 17: Allocation of Soluble Phosphate, June 1946-June 1947, approved 24 January 1947.

In North America the production and supply of phosphates for 1947/48 were reported to be about adequate to meet demands. The 1935-39 average consumption of phosphoric acid (P_2O_5) in the continental United States, Hawaii, and Puerto Rico was 652,000 metric tons, while the quantity available in 1947/48 was estimated to be 1,678,000 metric tons.

In most countries of Europe, consumption of phosphates has probably regained—and in some cases may exceed—the prewar level. Because of the decline in the production of basic slag, a by-product of the steel industry, countries depending on this material have experienced more difficult supply problems. This is true in particular of Germany, where the production of basic slag is much lower than in prewar years. While the supply of phosphates in Germany is being constantly improved, it does not yet meet requirements. Any difficulties in the current supply of superphosphates in European countries may be attributed chiefly to damaged war plants, inadequate processing facilities, or insufficient supplies of sulphuric acid. Improvements in supply have been effected, and plans for the future include a further increase in production.

The production of phosphate rock in North Africa now exceeds the prewar level. The rehabilitation of the phosphate rock industry on Ocean and Naura Islands has made good progress since production was resumed about two years ago, although problems have recently arisen which have impeded production somewhat. The distribution of phosphates in Australia and New Zealand is still rationed.

Since the removal of phosphatic fertilizers from allocation on 30 June 1947 complete production/consumption data for the year ending 30 June 1948 are not yet available.

Potash

Current potash supplies are not sufficient to meet world needs even though production in some countries has increased appreciably. In contrast to a prewar consumption of 2,518,000 metric tons K_2O, stated world requirements for potash for the year ending 30 June 1947 were 3,245,000 metric tons K_2O, against which it was estimated that approximately 3,020,000 tons K_2O were made available.[2] In the United States, production in 1947 reached 953,000 metric tons K_2O, as compared with 283,000 metric tons in 1939.

The rehabilitation of the French potash industry is shown in the increase in production to an estimated distribution of 650,000 metric tons K_2O in 1947/48. Production in the French, United Kingdom, and United States Zones in Germany approximately meet current requirements. The main potash deposits are in the U. S. S. R. Zone but exports have been negligible compared with the large quantities exported prewar. Spanish production in 1947 reached 216,000 tons K_2O compared with 135,479 tons in 1946, a record year, and exports jumped from 86,039 to 184,295 tons.

The removal of potash from international allocation, as with phosphates, has caused the international trade to be influenced mainly by price factors and the United States financial aid.

[2] IEFC Recommendation No. 16: Allocation of Potash Fertilizers, July 1946-June 1947, approved 24 January 1947 (exclusive of the U.S.S.R.).

Chapter 17

FARM MACHINERY AND DRAFT POWER

THE use of modern farm machinery has grown up mainly in the industrialized countries of Europe and North America and in certain agricultural areas developed in comparatively recent times, e.g., Oceania. Use of modern equipment is making fairly rapid progress in parts of Latin America, but so far has found little application in southern and eastern Asia and in the bulk of the African continent.

Although the number of tractors in the world has trebled since 1930, draft animals still provide an overwhelming proportion of farm draft power in most regions. It is difficult to estimate the draft power used in farm operations, but some extremely tentative figures have been compiled on work-stock numbers in the major regions in terms of draft power units. These estimates show a steady decline in draft animals in the most highly mechanized parts of the world. In other areas animal numbers have tended to increase except where war devastation was serious. The drop is most marked in the Far East as a result of severe wartime losses of water buffalo and rinderpest outbreaks.

In Burma, Siam, and southern China, the shortage of draft cattle is delaying the recovery and expansion of rice production. Immunization against rinderpest, now being started under FAO auspices, can improve the working efficiency of the remaining herd. From a long-term point of view, some of these lands and also India are probably overstocked, but a reduction in numbers could be made only if tractors were introduced simultaneously or the quality and health of the remaining animals were improved.

The increase in tractors appears to have more than offset the decline in animal power in North America and the United Kingdom, but not in continental Europe and the Far East.

TABLE 83.—DRAFT POWER ON FARMS, REGIONAL AND WORLD TOTALS[1]

Region	1930			1938/39			1946/47		
	Tractors	Draft Animals	Total Draft Power Units	Tractors	Draft Animals	Total Draft Power Units	Tractors	Draft Animals	Total Draft Power Units
	(*Thousands*)	(..*Million units*..)		(*Thousands*)	(..*Million units*..)		(*Thousands*)	(..*Million units*..)	
North America	1,020	15.8	21.9	1,597	12.3	21.9	2,890	8.5	25.8
United Kingdom	20	0.6	0.7	60	0.5	0.9	200	0.4	1.6
Europe (excl. U. K.)	110	22.3	23.0	205	23.0	24.2	312	19.3	21.2
Latin America	20	39.8	39.9	35	41.2	41.4	62	42.2	42.6
Near East	4	4.6	4.6	7	5.2	5.2	10	6.3	6.4
Far East	1	110.5	110.5	5	112.9	112.9	10	96.5	96.6
Africa	10	7.8	7.9	17	8.5	8.6	26	8.8	9.0
Oceania	32	1.5	1.7	53	1.4	1.7	90	1.1	1.6
TOTAL[1]	1,217	202.9	210.2	1,979	205.0	216.8	3,600	183.1	204.8

NOTE: Draft Power Units as follows: tractor=6; horse and mule=1; buffalo=.9; draft cattle=.5.
[1] Excludes U.S.S.R.

In the devastated areas farm losses through war damage and obsolescence were not, of course, confined to draft power, but extended to all types of farm equipment. In many other countries interruption of overseas supplies and wartime diversion of domestic industries to other purposes have created somewhat similar problems of shortage of farm implements. Table 83 gives estimated tractor numbers used in agriculture in various regions of the world in 1930, just prior to World War II, and in a recent postwar year. The disparity in numbers of tractors from region to region becomes even more striking when considered in relation to the area of cultivated land as shown in Table 84.

TABLE 84.—NUMBER OF TRACTORS IN RELATION TO AREA OF CULTIVATED LAND

Region	Area of Crop Land	Percentage of World Total Cultivated Area	Percentage of World Total Tractor Numbers (1946/47)
	(*Million hectares*)	(*Percentage*)	(*Percentage*)
North America	202	16.9	72.1
Europe	145	12.1	12.8
Latin America	66	5.5	1.5
Near East	40	3.3	0.3
Far East	409	34.1	0.3
Africa	70	5.8	0.7
Oceania	21	1.8	2.3
U. S. S. R.	246	20.5	10.0

While tractor numbers provide an indication of the distribution of mechanical draft power, they give very little indication of the total amount of equipment on farms. Statistics of implements and machines in use in agriculture are available for only a few countries.

Production and Overseas Trade in Farm Equipment

Available data on tractor and other farm machinery production and trade between regions in 1947 are presented in Tables 85 and 86. Production data are not available for Latin America, the Near and Far East, Africa, and the U. S. S. R.; but except in the U. S. S. R. the industry in these regions is of limited capacity and mainly confined to the production of relatively simple implements. Exports from these regions are negligible. It is apparent that at least 75 percent of the production of tractors and other farm machinery combined was concentrated in 1947 in North America. This region also supplied the great bulk of material entering world trade. The principal markets outside North America were Latin America, Europe, and Africa, with relatively minor quantities going to the Near East and the Far East. Oceania, practically self-sufficient in other items, was a fairly large importer of tractors. Total world production of agricultural implements in 1947 was double the prewar volume. The volume of overseas sales has also increased in roughly the same proportion; in particular the great expansion in United States production has been associated with a proportionate expansion in United States exports. Nevertheless, demand is considerably in excess of the current capacity to supply. With elimination of Germany as a major exporter, a greater task has to be faced by remaining exporting countries and by domestic industry in importing countries.

The United States and the United Kingdom are the only major tractor producers now able to supply foreign markets. Output is, however, being rapidly stepped up in a number of European countries including France, Sweden, Poland, and Czechoslovakia, while

Canada is starting to produce tractors in appreciable numbers. Manufacture is being initiated in Australia and contemplated in Brazil and other areas. The U. S. S. R. plans to restore its prewar annual output of over 110,000 units by 1950/51. There has been a striking recent growth in the popularity of horticultural or garden-type tractors for the mechanization of small farms and gardens. The United States market appears to be nearing saturation for this type of equipment, but there is growing interest in small field-crop tractors suitable for operation on farms of 20 hectares or less. Some further expansion in international trade may be anticipated in the future as plant capacity in the United States is being increased and European plans contemplate considerable exports of medium and light units.

International trade in farm machinery other than tractors accounts for a smaller proportion of total production. Manufacturing processes are less specialized than is the case with tractors, and many countries are able to supply some at least of their needs. The salient features of production and international trade in 1947, insofar as it has been possible to determine them, are given in Table 85.

TABLE 85.—FARM MACHINERY SITUATION, 1947: TOTAL VALUE IN MILLION DOLLARS OF TRACTORS AND OTHER EQUIPMENT

Country or Region	Production [1]		Exports [2]		Imports [3]	
	Total	Machinery Other than Tractors	Total	Machinery Other than Tractors	Total	Machinery Other than Tractors
	(*Million dollars*)					
United States [4]	1,444	740	318	95	32	26
Canada [4]	50	40	48	42	106	35
United Kingdom	175	70	36	15	18	13
Europe(excl. United Kingdom)	[5] 200	[6] 170	...	...	[7] 68	[6] 26
Latin America	...	...	...	...	[7] 92	[6] 34
Near East	...	...	...	...	[7] 10	[6] 3
Far East	...	...	...	...	[7] 15	[6] 6
Africa	...	...	...	...	[7] 40	[6] 15
Oceania	[8] 20	[6] 20	[6] 2	[6] 2	[7] 22	[6] 4
U.S.S.R.	...	...	...	...	[9] 3	[9] .5
TOTAL OF AVAILABLE DATA	1,889	1,040	404	154	406	162

[1] Factory prices.
[2] Export prices at ports.
[3] Import prices where published, otherwise totals priced at ports of export from United States, Canada, and United Kingdom.
[4] Farm equipment exchanged by United States and Canada accounted for 136 million dollars of the exports and of the imports.
[5] Estimates based largely on OEEC (Organization for European Economic Co-operation) figures for 1946/47.
[6] Estimate.
[7] As the United Kingdom Trade and Navigation Accounts do not give a complete breakdown of exports by country of destination, it has been necessary to make rough estimates in some cases of imports from the United Kingdom.
[8] Estimated or partially estimated.
[9] From the United States.

The 1948 situation cannot be precisely assessed at this stage, but it is apparent that levels of output and international trade will be higher than in 1947. North American tractor production is expected to show at least a 10-percent increase in volume over 1947. Because of a price increase of some 10 percent, value of output will show a more marked rise. In the United Kingdom, tractor production will probably show a 50-percent increase while exports will be more than double. Output in continental Europe may also rise substantially. Considering the world as a whole, with the exclusion of the U. S. S. R., a 20-percent increase in the volume of production appears probable. The increase in the

TABLE 86.—TRACTOR SITUATION, 1947

Country or Region	Production	Exports	Imports
	(*Thousands*)		
United States			
Wheel and track	458	98	...
Garden	169	15	...
TOTAL UNITED STATES	627	113	6.6
Canada	...	6	42.5
United Kingdom			
Wheel and track	58	...	...
Garden	28	...	...
TOTAL UNITED KINGDOM	86	[1] 20	[1] 5
Europe (excl. United Kingdom)	[2] 20	...	[3] 30
Latin America	...	...	[3] 25
Near East	...	...	[3] 2
Far East	...	...	[3] 3
Africa	...	...	[3] 10
Oceania	...	...	[3] 13
U.S.S.R.	[4] 34	...	[5] 2
TOTAL OF AVAILABLE DATA	767	139	139

[1] Estimated from statistics of weight and value. [2] Approximate figure.
[3] United Kingdom Accounts of Trade and Navigation do not give complete breakdown of exports. These figures are for United States exports with estimated additions for United Kingdom and other sources. [4] Planned. [5] From the United States.

volume of tractor exports may be 30 percent over 1947. Increased supplies will probably be available to all areas, though Europe may receive a relatively larger share of North American exports as a consequence of the European Recovery Program.

Spare Parts for Machinery Already on Farms

Failure to make full use of machinery already on farms because of inability to secure spare parts represents a direct challenge to the organizing power of the farm-machinery industry and the governments. The problem is made the more difficult in Europe because the extent of the need in terms of specific spare parts for particular types of machines is unknown and because the great diversity of types and models gives rise to a manufacturers' problem in tooling up for small quantities of spare parts. A partial solution might lie in making spare parts in local machine shops, especially if farmers organized into groups and pooled orders for parts, with exact specifications where possible. However, the basic solution for the large number of machines of German origin may be to restore production of spare parts in German factories.

Servicing Problems

The problems of servicing machinery include the organization of technical services, repair facilities, a distribution network for spare parts, and the supply of proper fuel and lubricating oil, all of which require considerable time to become effective. These problems must be faced both in those European areas in which mechanization has so far been very limited and in non-European countries beginning to use machinery. Countries requiring only small quantities of machinery are at a disadvantage because manufacturers are unwilling to establish dealers for sales and service except where an expanding market can be expected. Where fully commercial services cannot operate profitably, the problem

requires the attention of governments. A certain degree of geographical concentration of any one type and make, if feasible, would facilitate servicing.

Effective Use in Previously Unmechanized Areas

In the past the use of machinery has spread gradually, as natural, economic, and cultural factors proved favorable. Unless careful attention is given to all of these factors, attempts to introduce machinery on an extensive scale into new areas are dangerous. Farmers in need of more power cannot necessarily change over rapidly to the use of tractors, even when these are available. It is necessary to determine the adaptability of mechanization and of the machines to the work to be done; the characteristics and experience of the people who will have to operate and maintain the machines; and the feasibility of organizing the many-sided services mentioned above. In short, a great many factors determine the successful use of machinery and, above all, the rapidity with which the use of machinery can be increased. Not the least of these are the training of operators and maintenance mechanics and the availability of machines suitable for local requirements—a matter which in new countries can often be determined only by experiment.

Future Prospects

It seems likely that the accumulated backlog of demand will be of relatively short duration and that long-term needs will be determined by fresh mechanization and replacements of worn-out and obsolete equipment. There is evidence of a progressive, long-term increase in the amount of farm machinery employed in response to steadily rising standards in the productivity of labor. However, short-term demand is largely conditioned by the prices obtained by farmers in relation to farm costs. During the economic depression of the 1930's, total sales of farm equipment fell to a fraction of the volume recorded in the late 1920's. In Canada, for example, tractor sales in the western provinces between 1931 and 1936 totaled only 9,000, compared with an addition of some 60,000 tractor units between 1921 and 1931; and Argentina was actually re-exporting equipment during the 1930's.

The present situation and the prospects for the immediate future differ in a number of important respects from the situation in the 1930's. First, prices of farm products, even if they recede somewhat from present levels in some countries, seem likely to remain relatively favorable for some time; consequently, farmers may be expected to maintain a strong demand for equipment. Second, there is a widespread shortage of farm labor. This draining of manpower from the land is largely irreversible, and only an extremely severe industrial depression would be likely to result in an increased agricultural labor supply. It appears to be a fair conclusion, therefore, that a sudden collapse in the demand for farm equipment is unlikely in the near future. On the other hand, there is evidence, at least in the United States and the United Kingdom, that production is catching up with demand to some extent.

Production of farm machinery would be stimulated considerably if manufacturers had more information on needs throughout the world. Much information on quantitative and qualitative requirements and on use of machinery is available and could be assembled in various countries. This assessment of demand would need to be made in terms of particular types of machines, with full regard to the problems of adaptability, training, maintenance, and servicing already outlined. The period of time over which machinery producers have a reasonable guarantee of demand for their products is a major factor in making possible the maintenance or expansion of production.

If, for instance, governments could enter into long-term commitments for the purchase of machinery, it would aid manufacturers in planning production.

On the supply side, much more detailed information is needed on the rate at which production of various types of machinery is expanding and on possibilities for further expansion. Possibilities of rehabilitating former factories, enlarging existing factories, and establishing new factories should be considered. The extent to which countries should depend on imports or manufacture their own machinery should be appraised.

Forestry Equipment

Increased production of wood calls for corresponding increases in the equipment needed for logging operations and for the industrial transformation of the roundwood into timber and other products. Meeting this need raises a variety of problems in different regions of the world.

In North America present output of forest products is close to an all-time record and meets with few equipment problems. However, even in the United States, the replacement of worn tractors, bull-dozers, and other logging equipment is complicated by long delivery periods.

European timber production is held up as a result of three types of bottlenecks:

In the first place, there are serious bottlenecks in logging operations. Worn and obsolete logging equipment which, as a result of war, prewar depression, and currency difficulties, has served far longer than it should, urgently needs to be replaced. In addition, since increased timber production makes it necessary to take logs from more remote and generally inaccessible forest areas, there must be new roads, cable ways, and in general additional logging equipment. Finally, European logging methods have so far made extensive use of horsepower, and the number of horses has declined greatly in recent years. It now has become necessary either to bring more horses into logging operations and to provide for the necessary fodder or else to change over from animals to mechanical power and in that case to supply timber producers with fairly substantial numbers of tractors and also with some bull-dozers to adapt logging roads to mechanized transportation.

In the second place, there are the equipment needs of the sawmilling industry. Here there is no problem of capacity because, generally speaking, the sawmilling capacity in all countries is sufficient. But once again equipment is worn and obsolete. Especially large amounts of such short-lived production equipment as sawblades, chains, and conveyor belts have to be replaced.

A third factor in this connection is the need for substantial amounts of consumer goods. This is part of the general problem of meeting the manpower shortage in forests and sawmills. In several European countries thousands of potential forest workers avoid this occupation because they do not have boots and warm clothing and cannot expect to get enough food to support the heavy effort needed in connection with forest work. Additional supplies of these consumer goods are believed by many experts to be the principal condition for raising European timber production.

In Latin America, Africa, and the Far East the equipment problems of the forest industries are of an entirely different order. What is needed here above all are modern industrial installations beginning with road-building equipment and ending with modern machinery for the fabrication of secondary forest products, such as doors, furniture, and paper. This poses a problem of heavy capital investment, i.e. of long-term credits. It also raises difficulties of currency to pay for machinery from dollar countries.

APPENDIX

CONSTRUCTION OF AN INDEX OF AGRICULTURAL PRODUCTION

Previous Work

Work on international index numbers of agricultural production has already been done by the League of Nations, the International Institute of Agriculture, and public and private agencies in individual countries.

(1) The League of Nations published agricultural production indices for the world and by continents as subindices of its world indices of primary production.[1] These indices were constructed according to Laspeyres' formula. They were based on the average annual production in the quinquennium 1925-29. The weights used were representative "world" prices prevailing in 1930, expressed in terms of gold dollars according to the average annual rates of exchange. No specific explanation is given for how, exactly, the representative "world" prices were obtained that were used as weights.

(2) The International Institute of Agriculture published a study, *Denrées et Matières premières agricoles, 1934-1938,* Rome, 1942[2], which contains data on world and continental agricultural production exclusive of fruits and vegetables, poultry, eggs, and minor products. Quantities produced of each commodity covered in the study are shown in quintals by continents and for the world. Since weights of heterogeneous commodities cannot be added, it was necessary to express the production of all commodities in a common unit. A scheme of uniform average 1934-38 "world market prices" was developed for weighting and aggregating the individual commodity production figures. These aggregates were computed for average annual 1934-38 production only. Thus, they were not used for the construction of any temporal index numbers. However, percentages indicating continental production relative to world production by individual commodities and by aggregates were given.

(3) The Office of Foreign Agricultural Relations, U. S. Department of Agriculture, published for selected countries food production indices which were weighted by calories.[3] With this approach non-food products have to be disregarded. Moreover, since the aggregation of food products in terms of calories permits no distinction between high-value animal products and low-value vegetable products, a calorie-weighted index has only circumscribed usefulness.

[1] League of Nations, *Statistical Yearbook of the League of Nations,* Geneva, 1939, pp. 175-177, and *World Production and Prices, 1938/39,* Geneva, 1939, pp. 15 ff. and 87-100. Methods of construction are explained in *World Production and Prices, 1936/37,* Geneva, 1937, p. 98.

[2] In the English edition, *Agricultural Commodities and Raw Materials, 1934-38,* Rome, 1944, data are presented in English rather than in metric units and in gold dollars rather than in gold francs.

[3] USDA, *Foreign Agricultural Circular,* Washington, 4 November 1946, p. 5.

Method of Construction

The FAO secretariat decided to adopt a price-weighted index and to use Laspeyres' formula as being the most suitable for comparisons through time. Most of the basic data on production and utilization given in this Report were taken from FAO's food balance sheets that have been constructed for 53 countries covering 85 percent of the world's population.

The countries listed below are those for which the food balance sheets were constructed. The proportion of the population of countries reported on in each region is expressed as a percentage of the total population of the region.

Far East—90 percent

Burma
Ceylon
China
India/Pakistan
Indo-China
Japan
Java and Madura
Malaya
Philippines
Siam

Europe—100 percent

Austria
Belgium
Bulgaria
Czechoslovakia
Denmark
Finland
France
Germany
  Bizonia
  French Zone and Saar
  Soviet Zone
Greece
Hungary
Iceland
Ireland
Italy
Luxemburg
Netherlands
Norway
Poland
Portugal
Rumania
Spain
Sweden
Switzerland
United Kingdom
Yugoslavia

United States and Canada—100 percent

Central and South America—80 percent

Argentina
Brazil
Chile
Colombia
Cuba
Mexico
Peru
Uruguay

Oceania—79 percent

Australia
New Zealand

Africa—32 percent

Algeria
French Morocco
Madagascar
Tunisia
Union of South Africa

Near East—33 percent

Egypt
Turkey

World Average—85 percent

It should be emhasized that all the index numbers applying to food in Part I of this Report, whether concerning production, international trade, or consumption, refer only to changes which have occurred in the groups of countries mentioned above.

In order to avoid double counting of feeds, first as crops and then again as meats, milk, and other livestock products, feeds were deducted from gross production. Since pasture and forage crops are completely utilized by livestock, they were simply omitted

on the work sheets rather than being listed and then deducted again *in toto*. Conceptually, this practice is assailable, since it is possible that a country exports, say, hay or fodder beets. In that case, the exporting country should have been credited with the production of these feed exports and the necessary deduction should have been made from the production aggregate of the importing country. It is believed that the error resulting from this omission is negligible. All crops which customarily do not exclusively serve as livestock feed were actually treated in the manner indicated, that is, they were listed and the portion fed to livestock was deducted from gross production. The resulting difference or "net production" was used for the making of the index number. Exports were credited to the producing country; if fed to livestock in the importing country, the imported feed grains were deducted from the production of the importing country. Thus, several maize-importing European countries show a negative maize production. In other words, this simply means that the maize fed to livestock was deducted from the agricultural production of the countries concerned. However, no deductions were made for skim milk, oilcakes, middlings, bran, beet pulp, brewer's grains, etc., fed. The very rough assumption has been made that all the value of milk used for butter went into the butter, all the value of oilseeds into the oil, all the value of grains into the flour, etc.

The FAO indices are essentially based on a gross production concept (modified only by the deduction of imported feed grains); but no other import or production factor is deducted. It should be noted that the use of the term "net production" is intended to express gross production minus feeds fed; it is not a "value added" concept.

That part of crop production which was used for seed or went to waste was generally not deducted. Only if the entire production of a crop in a country other than seed and waste was fed, then the entire production including seed and waste was deducted. This treatment of seed and waste is in line with the "gross production minus feeds fed" concept. Moreover, any other treatment of these two items would have necessitated additional assumptions and calculations which would have influenced the production aggregates only to a limited extent and the indices even less.

Base Period

The Standing Advisory Committee on Statistics recommended on 11 August 1947:

> "Production indices should be based insofar as possible on a common four- or five-year period within the years 1934-1940. One year's production as a base is to be avoided. Insofar as possible the same prewar base period should be used for all countries, but it is recognized that modifications will be necessary to avoid distortions of the index numbers of individual countries."

Following this recommendation a five-year base was used, most frequently that of 1934-38, but this varied for certain countries having special circumstances, e.g., China, 1931-37; Spain, 1930-34; and the United States of America, 1935-39.

The food balance sheets were generally set up for a "consumption year" running from July to June. However, this particular 12-month period could not always be rigidly adhered to in setting up the food balance sheets but had to be modified in accordance with the latitude of a country and with harvest seasons; Latin-American balance sheets are on a calendar year basis. The amounts of feed fed and deducted from gross production are supposed to represent the amounts fed during the crop year. This implies that there is no direct relation between amount of feed fed and amount of livestock and livestock products produced for consumption. This may be

illustrated by two extreme cases: (1) with a feed shortage and resultant livestock liquidation, small amounts of feed fed are associated with a large production of livestock; (2) when livestock numbers are rising, much feed may be fed but little livestock slaughtered. Inventory changes in numbers and weight of livestock have been disregarded. In some cases when price or quantity data were lacking for individual crops it was necessary to establish groups, e.g., "Vegetables," "Legumes (pulses)."

Prices for Use as Weights

In using prices as weights a decision has to be made whether uniform prices for all countries should be used or whether the production of each country should be weighted by its particular national price scheme. In order to obtain greater comparability it was decided to adopt a uniform international price scheme. It is important in this connection to recognize the fundamental conceptual difference between this method and the method of pricing used in national income studies. Aside from the net production concept underlying national income studies as compared with the gross production (minus feed fed) concept underlying the present study, the several constituents in a national income study are valued at their price in the national economy, whereas in this project a given amount of a commodity produced, and therefore also a given aggregate of commodities produced, is valued the same way regardless of the country in which it was produced.

After the decision was reached to use uniform prices in all countries for weighting the indices, a method of arriving at these uniform prices had to be devised. One method would be to calculate some sort of weighted average price for each commodity from all producing countries or from all important producing countries. This could be done by striking an arithmetic average. In that case each commodity would be priced independently of any other commodity. However, in using prices as weights for the construction of production indices, it is the *relation* of various commodity prices to each other that counts. Thus, another scheme of averaging would be to express each national commodity price as a relative, e.g., to wheat. For averaging relatives the geometric average is appropriate and, since the various national price relatives can be thought to vary in importance according to national production of each commodity, a weighted geometric average should be used. In either case—whether an arithmetic or a geometric average is used—protectionist policies would influence the average; prices prevailing in the "open" world market and prices prevailing behind tariff walls would both go into this average.

On the other hand, world market prices could be established by averaging the prices of exporting countries. This method was used in *Denrées et Matières premières agricoles,* the study quoted above.[4] Export prices were calculated from the values and quantities of specified agricultural commodities exported from 92 countries during the years 1934-36 and from 93 countries during 1937/38. These values (converted to reichsmarks) and quantities were added up in the *Statistiches Reichsamt* in Berlin and published in the *Statistisches Jarhbuch für das Deutsche Reich.*[5] The values were converted by the IIA from reichsmarks into gold francs at the rate of 0.81 RM=1.00 gold franc. FAO accepted the gold franc of 290.32258 milligrams of fine gold as the value unit in which prices were to be expressed for use as weights in this project (1) because

[4] IIA, *Denrées et Matières premières agricoles,* pp. 6 and 7.

[5] The 1940 and 1941 editions of the *Statistiches Jahrbuch* contain the data for all five years 1934-38. These editions are not generally available.

of the availability of many important prices in this form[6] and (2) because it so happens that the 1934-38 world export price of wheat was 100 gold francs per metric ton. Thus, each price quotation in gold francs per metric ton is simultaneously a price relative based on the price of wheat as 100 percent. Whenever dollars were used in our collection and computation of prices, the conversion of gold francs was made at the rate of $1=3.061 gold francs, since $1=888.6713 milligrams of fine gold.

The concept of a world market price often had to be modified. Dr. Valentino Doré, the author of *Denrées et Matières premières agricoles,* recognized already that the export price of some commodities is not indicative of the price of the bulk of the production. Export potatoes, for instance, tend to be earlier and of better quality than the bulk of the crop or they are seed potatoes. Thus, the price by which potatoes ought to be weighted should be lower than the average export price. The potato price was adjusted accordingly.

In the case of commodities for which no average of export prices could be computed for the years 1934-38, reference was made to the prices used in the IIA study quoted above; in default of a price from that source, the 1935-39 average prices received by United States farmers were used. For a few special commodities recourse had to be made to miscellaneous sources of information in the countries concerned.

The same series of price weights was used for all the calculations, that is, for index numbers of production, exports, imports, and supplies available for consumption. This last concept of "supplies" represents production less feed, less seed and waste, less exports, plus imports; it does not represent actual consumption since data are lacking for changes in stocks.

It must be emphasized that the index numbers which result from these procedures will not match with any individual country's index number on account of the international prices chosen as weights. Neither will the indices of changes in the volume of exports or imports match indices computed by using values recorded in trade statistics. However, these FAO indices do have the virtue of being all calculated on the same basis so that production, foreign trade, and supplies can be related to one another.

On the other hand, this first attempt at the construction of FAO index numbers must be regarded as tentative and provisional. The validity of the chosen prices requires further critical examination; likewise the quantitative information on production in many of the 53 countries requires revision and amplification, and it is planned to cover in due course a larger number of countries. It is hoped that work planned for the coming year will put the index on a sounder basis and make it more serviceable.

[6] IIA, *op. cit.,* p. 8.

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