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THE WORLD FOOD PROBLEM

proposals for national and international action

Item 9 of the Provisional Agenda

TABLE OF CONTENTS

PREFACE

The document on "The World Food Problem - Proposals for National and International Action" is the second main document prepared for consideration at the World Food Conference. In preparing this document and the proposals for action, the secretariat has been guided by the discussion and the various suggestions made by the Preparatory Committee of the Conference at its First and Second Sessions.

The document deals with item 9 of the provisional agenda of the Conference as recommended by the Preparatory Committee at its Second Session and approved by the ECOSOC at its 1916 Plenary meeting for adoption at the Conference:

Item 9. National and International Action:

(a) Measures for increasing food production in developing countries within the wider framework of development;

(b) Policies and programmes for improving consumption patterns in all countries, and aiming at ensuring adequate availability of food in developing countries, particularly to vulnerable groups;

(c) The strengthening of world food security through measures including inter alia a better early warning and food information system, more effective national and international stock-holding policies and improved arrangements for emergency relief and food aid;

(d) Specific objectives and measures in the area of international trade and adjustment which are relevant to the food problem, including measures toward stabilization, and expansion of markets for exports from developing countries;

(e) Arrangements for follow-up action, including appropriate operational machinery on recommendations or resolutions of the Conference.

In all these fields, specific proposals have been formulated and lines of action suggested, to facilitate the task of the governments in reaching a consensus on the main issues and actions that the Conference might take or recommend to resolve the world food problem in the short term and the longer term. In view of the vast and complex nature of the problem, the action programme has concentrated on specific areas where progress can be achieved by effective follow-up action at national and international level.

Each of the first four Sections of this document correspond broadly to the first four sub-items of agenda item 9. In the concluding and fifth Section of the document, arrangements for follow-up action have been suggested, including measures to increase the flow of resources for agricultural development and food production. At the beginning of the document the main proposals and recommendations are summarized in a manner that, taken together, they present the main elements of a strategy for resolving the world food problem.

The proposed action programme in the food sector has been prepared keeping in view the wider framework of development and the goals and objectives as agreed by governments in the context of the United Nations Development Decade and the Declaration on the Establishment of a New International Economic Order adopted at the Sixth Special Session of the UN General Assembly. Action along the lines suggested in this document is expected to contribute to the achievement of these wider goals and objectives.

In preparing this document, the secretariat has been assisted, to a great extent, by the wide technical expertise and accumulated experience of FAO, the main United Nations body in the field of food and agriculture. Also, the document has considerably benefited from the contributions received from other international organizations including the UN Secretariat, UNCTAD, IBRD, IMF, ILO, UNICEF, WHO, WMO, UNIDO, WFP, IAEA, UNDP and UNDRO. Without the intensive work undertaken by all these organizations, it would not have been possible to prepare this document in so short a time. I would like to place on record my warmest gratitude for their most valuable assistance. At the same time I would wish to emphasize that the proposals and statements in this document are presented on the responsibility of the Secretariat of the World Food Conference and do not necessarily reflect the views of all the agencies on all the subjects or issues.

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World Food Conference

A Strategy for Resolving the World Food Problem

1. In December 1973 the United Nations General Assembly decided to convene a World Food Conference because of the acute food crisis which had swept over the world since the previous year. This is a crisis more serious and widespread than the world has known since the forties. It has brought grave food shortages to some countries; prices of food, fertilizers and other commodities have skyrocketed. While some developing countries have gained in trade, most have suffered and faced labour unrest, social hardship and the effects of a growing inflation everywhere.

2. What happened in 1972? Looking back it can be seen that after nearly two decades of relative stability maintained by large surplus stocks of cereals, a combination of changes in national policies which reduced stocks and a series of natural events which reduced harvests in many parts of the world suddenly created a situation of worldwide shortages. Because of the high prices of cereals, fertilizers, farm machinery, and later of energy, a large number of developing countries have been experiencing a tremendous strain on their balance of payments which has dislocated their import programmes of other goods needed urgently for development. The importing developed countries have also experienced an interruption of supplies of foodstuffs and a sharp rise in retail food prices.

3. But there was something more than this. The fears and anxieties aroused during the past two years have reminded the world of the existence of a more profound and persistent food problem. This is nothing less than the continuing deprivation and suffering of the hundreds of millions of people who are permanently hungry and whose capacity for living a normal life cannot be realized. On the most conservative estimate there are well over 460 million of such people in the world today and their number is increasing. At least 40 percent of them are children. The majority live in rural areas; they are the small farmers, tenants and the rural people without land or employment. They include also the desperately poor in the slums of the major cities. Unless effective action can be mounted immediately, with sustained national and international support over the next decade, the gap between rich and poor countries and the gap between the least advantaged and the more affluent in the developing countries will widen to disturbing if not dangerous proportions.

4. What is called the world food problem is really two problems. The first is the threat of famine, food shortage or excessively high food prices, following the dislocation of supplies due to some disaster or unexpected fluctuations in production. This danger extends from relatively small dislocations affecting only a limited number of people to a major disaster caused by crop failures extending over many countries. The second problem is the ever present hunger of the poorest people of the world. The remedies for these two problems are different but they are interrelated. Action taken to achieve security in food supplies will in itself help the

people who are perennially hungry from facing actual starvation in years of poor harvests. Similarly, action taken to overcome poverty and promote development will in itself contribute to establish food security.

5. The main lines of an international strategy for resolving the world food problem have already been determined by the Preparatory Committee of the World Food Conference when it adopted the agenda for the Conference. Highest priority is accorded to the tasks and the objectives of increasing food production within the developing countries. In order to prevent the projected food deficits of the developing world, substantially higher goals of food production will have to be established and achieved. It is estimated in the following sections that the minimum requirement is to step up the average annual growth rate of food production from 2.6 percent in the preceding twelve years to at least 3.6 percent in the next twelve years. If this minimum acceleration in production is not secured, then, given the likely increase in demand, the developing countries as a whole might well face annual deficits approaching 85 million tons in normal years and over 100 million tons in years of bad crops.

6. The need for faster progress in future should not cause the success so far achieved by the developing countries to be underrated. In fact, when the developing countries examine their agricultural performance over the past twenty years they have some reasons to be gratified. Taking this group of countries as a whole, their agricultural production has been expanding as rapidly as that of the developed world even though they have had to contend with all the difficulties inherent in their disadvantaged position - their farmers' lack of capital, insufficiency of technological know-how, inadequate credit for purchases in inputs, shortage of trained manpower to expand agricultural services and obstacles to expansion of production for export because of market barriers in developed countries. In the absence of these significant gains achieved by many developing countries in introducing high-yielding varieties of wheat and rice and substantially improving supporting services, the present situation would have been much more serious. The main reason for the growing imbalance between the food supply and demand is the rate of population growth which in the developing countries is twice as fast as in the developed world. Today, there are about 2 500 million inhabitants whereas by the end of the century there might be 5 000 million mouths to feed.

7. If agriculture in developing countries is to respond in the future to the demands that are being made upon it, the sector will have to shift into higher gear. But output targets, though essential, will not be enough. Since the objective is to increase the food consumption levels of the undernourished groups of the population, special measures will be needed to bring the small farmers and the landless agricultural workers into the income and employment streams, to increase their productivity and purchasing power. This will involve the adaptation of improved food production technologies to small-scale farming operations, and the launching of

comprehensive rural development programmes. Whatever may be the circumstances of individual countries, all of them need to reexamine their food and agricultural policies in order to see how to move forward more rapidly toward the elimination of rural poverty.

8. Measures to increase production, including those which favour the rural poor will not be sufficient to solve the distribution aspects of the world food problem. The hundreds of millions of undernourished people cannot wait upon the slow-moving processes of agricultural modernization, rural development and urban prosperity for the relief of their hunger and ill-health. Direct measures for supplementing the food consumption of the needy groups of the population must find a place in the Conference agenda and in its overall strategy.

9. Experience has shown that no nation can achieve sustained economic and social development in the absence of an assured food supply, adequate as regards quantity and quality, at reasonable prices. Therefore, it is imperative that increases in food production and larger support for supplementary feeding programmes for the undernourished, are accompanied by an effective system of world food security to ensure that minimum food supplies are always available on reasonable commercial terms or on concessional or grant terms in the world system, to make possible the steady expansion of consumption everywhere, especially by the most needy populations. To this end, the Conference will consider the adoption of elements of a world food security system, based mainly on the draft International Undertaking on World Food Security being evolved under the auspices of FAO.

10. The stabilization of food prices is another important element of world food security included in the overall strategy before the Conference. By agreeing to a system of coordinated national stocks of security, the governments participating in the preparation of the draft Undertaking have taken a significant step toward stabilization. To complement this initiative governments may wish to take the next logical step toward stabilization by seeking to agree on price objectives within which they would operate their respective national stock policies. To this end, the documentation proposes some main lines of approach to possible international arrangements on grains, particularly wheat, for consideration and for further action by governments in the appropriate fora.

11. The overall strategy embodied in the agenda of the World Food Conference also recognizes the roles of trade and of international agricultural adjustment. Orderly and expanding trade in foodstuffs is essential to offset fluctuations in domestic production in both importing and exporting countries. Coordinated national stockholdings associated with international grains arrangements would go far toward the achievement of this objective. Beyond this, the document stresses the importance of export opportunities for both agricultural and non-agricultural products from developing countries that need foreign exchange to import food on a regular basis; and of assured outlets for food-exporting developing countries. At the same time, the concept of international agricultural

adjustment is necessary to provide a broad framework of world agricultural development objectives based on the goals of DD2 within which consultations to secure a longer-term balance between the demand for and supply of food can take place.

12. The World Food Conference is invited to endorse the main elements of the strategy for resolving the world food problem and at the same time, to go further and recommend how the strategy, as a whole and in its various parts, should be implemented, and to indicate - and so far as possible, mobilize - the additional resources required.

13. It is evident that the implementations of the strategy outlined above, which is as important as its identification and endorsement by the Conference, will call for a vast complex of interlocking and mutually supporting national and international actions, reflecting both the political independence and the mutual interdependence and cooperation of nations. Since national action is a matter of national resources, national priorities and national policy, it would be futile for the document to try to be specific in this area. No attempt has therefore been made to do more than indicate certain fields in which national policies should be developed, without trying to be comprehensive in view of the vast range of potential coverage of such policies. However, estimates of resources required for investment at national level have been presented. The document focuses primarily on recommendations for international action in the component parts of the overall strategy. The concept of international action is taken as referring to the establishment, strengthening or reorientation of an international policy an international programme, an international institution or an international fund.

14. In the crucial area of food production in developing countries marginal changes will not be enough. The implementation of the recommended national and international action would call for more than trebling of the current allocation of external resources for assisting the development of the agricultural sector in developing countries - from some U.S.$ 1.5 billion annually to around U.S.$ 5 billion annually over the period 1975-80. Governments have not yet reached a consensus on whether to favour a series of funds and approahces, or a single integrated fund. However, the magnitude of the additional effort needed is reflected in the amount of the total funding proposed.

15. In view of the size of the total effort required, the need to utilize existing agencies with their acquired competence, the importance of integrating the flow of external resources to individual countries for agricultural development projects with the new international initiatives proposed, the establishment of a new coordinating mechanism for the implementation of all the relevant recommendations has been proposed.

16. Action on the world food problem should have both a short-term and a longer term focus. There are many developing nations which by virtue of their adverse ratio of population to natural resources face special problems requiring special attention from the international community. Many of these developing nations lack fundamental aspects of trained manpower, stable and effective institutions, and adequate social and economic structures to effectively mobilize the inherent capabilities of their rural populations. Most of these countries have also been serious affected by the recent unfavourable economic events and deserve greater attention.

17. It is in this context of immediate special attention to major problem countries, while at the same time focussing upon the intermediate and longer run food problems of all the developing countries, that the World Food Conference should frame its recommendations. It should combine a sense of immediate urgency with a long-run optimism that the developing countries, with assistance from developed countries, can achieve the necessary increases in food output while meeting more adequately the goals of rural development and social justice. As regards longer-run solutions the Conference will be guided by the Declaration on the Establishment of a New International Economic Order, adopted along with a Programme of Action for its implementation, by the Sixth Special Session of the UN General Assembly. With respect to short-term measures, the Conference will take account of the Special Programme of emergency measures to mitigate the difficulties of the developing countries most seriously affected by the current economic crisis, initiated by the General Assembly as part of the above Programme of Action.

18. In the following paragraphs the main features of the component parts of the overall strategy for resolving the world food problem are summarized, and the recommended lines of action are indicated.

A. The Task of Increasing Food Production in Developing Countries

19. Various elements of a strategy for accelerating the expansion of food production in developing countries can be considered in four groups: (i) agricultural inputs; (ii) research; (iii) overall rural development and (iv) investment. It is not necessary to do more than recall here very briefly the main issues in each of these fields.

Fertilizers

20. In the immediate future increased food production is threatened by the supply of fertilizers, especially of nitrogen, which falls significantly short of the quantities demanded and needed by farm producers to increase or even maintain food output. This shortfall falls especially heavily upon the developing countries who are dependent upon imports from developed countries. The current high prices for fertilizers, even if the quantities required were fully available, denies them to many of the developing countries.

21. At the request of ECOSOC, the FAO Council has approved the establishment of an International Fertilizer Supply Scheme to increase the availability of fertilizers for developing countries at reasonable prices. The Scheme includes the creation of a Fertilizer Pool for receiving contributions of fertilizers in kind or in cash, financial assistance for the purchase of fertilizers, and measures to improve domestic fertilizer production in developing countries. Parallel or similar arrangements are proposed for pesticides. It is too early to judge whether these measures will achieve their short-term objectives, but it is absolutely vital to consider additional measures, as required, to ensure that the need of developing countries for fertilizers and pesticides are fully covered.

22. There is no inconsistency in asking developed countries to make available larger quantities of fertilizers to developing countries and at the same time produce more food for larger consumption and for world reserve needs. Without adequate fertilizers and pesticides, the developing countries would risk even bigger shortfalls in food production requiring larger food aid on concessional terms, and encounter further social and economic disruption caused by food shortages and high food prices.

23. Action is also urgently needed to evolve a medium- and longer-term fertilizer strategy as a part of the efforts to evolve a world fertilizer policy. Projections of future demand for fertilizers in developing countries show that if availability is not a constraint, and national policies continue to support larger use, the effective demand in developing countries (excluding centrally planned economies) could expand by about 11 percent per annum up to 1980/81, compared to 13 percent per annum in the period 1962-73. This would mean a doubling of consumption, from about 10 million tons (excluding potassium) in 1972/73, to 22.6 million in 1980/81. Against this the firmly committed expansion of production capacity might increase the expected supply of nitrogen and phosphates from about 4.8 million to 10.4 million over the same period, leaving an uncovered gap of about 12.2 million tons. Despite the rapid increase in new investment in fertilizer capacity in the developed countries in the past year, there is no prospect that they would be in a position to cover the whole of this projected gap. In fact, the total production capacity in developed countries, as existing and firmly committed as of April 1974, would not be enough to meet the total fertilizer requirements of about 65 million tons within the developed countries.

24. It is therefore important to develop a fertilizer production strategy which (a) creates fairly quickly new fertilizer capacity in those developing countries which have abundant raw materials, and also in countries where particular circumstances make local production viable, (b) evolves cooperative ventures to promote a more economic and stable system of fertilizer production and supply between potential producing countries and consuming countries. The international community must help to supplement the resources required in importing developing countries and at the same time facilitate the formulation of these cooperative ventures between the three parties - the producing countries with raw materials, the consuming countries with markets, and established fertilizer producers with technical and managerial skills to implement the proposed strategy. It is

estimated that total investments of about U.S.$ 6.5 billion would be required to produce about 11 million tons of plant nutrients by 1980/81 in the developing countries.

Water and Other Inputs

25. Other inputs such as increased water resources, better seed, better livestock and improved management are equally important. There are very few developing countries where all of these inputs are adequately employed, yet their proper and coordinated use could permit significant increments in average yields per hectare in the output of various crops. Immediate benefits could be obtained by making better use of existing irrigation facilities and by exploiting existing groundwater supplies, to mention only one example. In the longer run it may be necessary to bring into production large areas of hitherto uncultivated land, most of which is to be found in Latin America and in Africa. The importance of improved seeds is clearly illustrated by the success achieved by many countries in adopting and utilizing high-yielding varieties of wheat and rice.

Appropriate Technology

26. A second key ingredient needed to increase production is agricultural research. A substantial part of this has to take place in the developing countries themselves to assure adaptation to local conditions. A vital component must come from international centres and the research institutes in developed countries working on the problems of the developing world. The high-yielding varieties already evolved represent dramatic examples of a combination of intensive plant breeding at international centres coupled with far-reaching field trials of the new varieties in the developing countries. There is an urgent demand for expanded research resources so as to do for other basic food crops what has been done but not completed for wheat, rice and maize. Basic research is also urgently needed for evolving breeds of ruminants adapted to tropical climates, for devising ways of increasing the available supplies of fish, for discovering how to maintain the fertility of soils in the high-rainfall tropics, for improving the stock-carrying capacity of rangelands in the semi-arid zones and for many of the more long-distance problems concerning, for example, genetics and the photosynthesis of plants. Agricultural technology which until now has been concerned largely with the problems of the temperate zone countries must be drastically re-oriented to cope with the problems of the warmer regions where most of the undernourished people live.

Rural Development

27. The objective of doubling the output of food in developing countries over the next fifteen years is not merely a technical problem which can be resolved only by applying technology, investment and inputs. The key element is the involvement of the people, particularly the small farmer and the landless workers. Unless these poorest segments of the rural population can participate in the processes of production and employment, technology,

fertilizer and other inputs will not be utilized fully or efficiently, the food that is produced will not be distributed equitably and small farmers and the landless workers will remain poor and undernourished.

28. Every country will have to evolve its own approach to rural development to meet its own particular objectives and needs, but it is important to recognize that human resources are the most precious resource the developing countries have, that their mobilization and fuller utilization is a complex long-term process, that a beginning toward meaningful structural change can be made by organizing the small farmers and the landless workers in rural areas into viable institutions to improve their land, control and manage water resources, apply improved technology and to gradually diversify the rural economy. Viewed in this context, integrated rural development is essentially a self-help operation which seeks to achieve the maximum possible economic and social progress with a minimum of outside assistance and which takes a comprehensive view of the needs of human beings living in each particular community.

Investment in Agricultural Development

29. A principle factor required to achieve the food production goals is a major increase in the funds available to developing countries for agricultural and rural development. The present flow of external resources for agriculture in developing countries is about U.S.$ 1.5 billion per annum. It would seem necessary to increase this to at least U.S.$ 5 billion per annum in the next five years between 1975 and 1980. This would facilitate stepping up the rate of total investment in agriculture to a range of U.S.$ 16 to U.S.$ 18 billion during this period. If acceleration on this scale does not take place and the projected food gap is as large as indicated by the recent trends of demand and supply - viz. 85 million by 1985, the annual cost of importing this food would be many times larger and would be almost unbearable.

30. Land and water development will require support of about $2.5 billion annually from external sources (expressed in 1974 prices). Much of this would go to Asia, the Near East and parts of Africa where the immediate priority is renovation and improvement of existing irrigation systems to increase yields and cropping intensity, and thereafter expansion of new irrigation. New land development, particularly in Latin American countries, would be accelerated later in the period. A start would be made toward opening up the vast tse-tse fly-infested areas of Africa for livestock production.

31. Support for credit programmes for farmers, particularly the small producer, and for marketing, storage and processing facilities would involve about $1.2 billion, including annual increments of $200 million to revolving credit funds for farmers' purchases of seasonal inputs such as fertilizers.

32. External financial aid for the construction of fertilizer plants in poor developing countries, and assistance in meeting the high cost of increasing fertilizer imports, would add about $700 million per year ($200 million for plants, and $500 million for imports). The total net investment required for the expansion of fertilizer capacity in develop-

ing countries is much larger - about $6.5 billion in the period up to 1981, or about $1 billion a year, but about 80 percent of the required investment in the oil-producing countries is expected to come from the oil-producing countries themselves.

33. To expand total investment in national, regional and international agricultural research to the level required to build up the technological base for improving productivity would require about $600 million annually of external financial assistance, about half the total cost.

34. Without major initiatives to increase external funding, the amounts of such funds will fall far short of requirements. Despite significant shifts in priorities to agricultural and to small farmers, IBRD/IDA resources foreseen for allocation to agriculture are not likely to exceed $2 billion annually. Other multilateral agencies and bilateral donors, given present indications, may run about $500 million or a little higher. Thus, there is need to mobilize an additional amount of about $2 or 2.5 billion annually. It would be reasonable to expect that half of the additional requirements of at least $2 billion would be provided by the oil-producing countries and the rest could come through a further expansion of existing bilateral and multilateral assistance programmes for agricultural development.

35. The proposed expansion of investment in agriculture will require a considerable increase in technical assistance. Loans made by IBRD/IDA on average allocate about 10 percent for training, feasibility studies, project preparation and other related activities. For an interim period of several years, it seems clear that much more effort will need to be directed to this end to build up the capacity of developing nations to absorb investment effectively.

36. The investment needs of the developing countries are of course extremely unevenly distributed. On the one hand, there are a few countries sufficiently prosperous to have no financial problems at all, though they may have problems of an insufficiency of trained manpower. On the other hand there are the least developed countries and others with a substantial hard-core of poverty. The requests from these countries should be given urgent and sympathetic consideration as has been already envisaged in the Action Programme formulated at the General Assembly's recent Special Session. It is these countries where the most intensive programmes will be needed to overcome hunger and it is these who will be unable to launch their programmes without a major contribution from more affluent outside sources. It should also be emphasized that the costs of the proposed programme to assist agricultural development would be only a small fraction of the cost of filling the food deficits via concessional food aid.

Constraints and Obstacles

37. Officials and policy makers in the developing countries may find all too familiar this catalogue of objectives and programmes for the farm sector. They have been written about for many years and have been the subject of innumerable reports; they have been discussed at meetings of experts and at intergovernmental conferences. There is not a Minister of Agriculture or of Rural Development who would not like to be doing more to achieve these aims and who does not feel frustration at the constraints around him. What then are the obstructions which need to be removed to enable these agricultural policies to be prosecuted more vigorously? Of course, circumstances vary widely between countries and in real life there is never one but rather a whole network of difficulties standing in the way of progress. Yet, in the last analysis, the really major obstacles can perhaps be reduced to three: men, money and markets. It is the deficiencies in all of these which cause the frustrations and hold up progress.

38. Shortage of trained manpower to carry out even the existing programmes is a bottleneck which every developing country experiences. Many are making a vigorous effort to remedy this by expanding the provision for technical education and training and by granting fellowships for study abroad. However, in view of the continuing shortage and the prospect that it is likely to become more acute with the intensification of agricultural development, there are strong arguments for deciding to allocate much more generous funds for training purposes. Simultaneously, external assistance ought to be rapidly and massively augmented both in support of national training programmes at all levels and as a component of bilateral, UNDP and World Bank operations. Since it has been suggested that the agricultural research effort needs to be tripled or quadrupled between now and 1985, at least a similar increase in training activities would be appropriate. All training does not need to be formal and over-sophisticated. In fact, many countries have scores of unemployed agricultural graduates while their farmers badly need advice and assistance from trainers who can communicate with them and understand their problems.

39. The shortage of money or resources creates problems at three different levels; first, there is the question of external resources where requirements, as already indicated, are much larger than the available flows. Then there is the shortage of domestic resources for programmes of agricultural and rural development and finally, there are the difficulties of tapping local resources for local development. Organizing the rural communities to undertake projects to develop their own resources to meet their needs is often the most effective way to use the under-utilized manpower resources available to developing countries.

40. The third constraint concerns markets. It is not so much a question of expanding and modernizing the arrangements for the disposal of farm produce on domestic markets, important though such programmes

are. It is rather a question of developing and expanding agricultural export markets, chiefly because for many years to come the majority of developing countries will have to rely upon agricultural commodities as the principal means of earning foreign exchange. For many years, the developing countries have faced mounting difficulties in world markets, partly because of restrictive practices of most developed countries who erected and maintained tariff and non-tariff barriers, and partly because of competition in the case of temperate products from developed exporting countries with better-endowed farms and more elaborate marketing organizations. Though some progress has been made in recent years in removing certain of these restrictions, much more needs to be done and the need is urgent. It is to be hoped that the forthcoming negotiations within the GATT will seek solutions to these problems.

41. It cannot be disputed that progress in the rapid removal of these major obstacles, namely trained manpower, investment funds and secure markets, is the pre-condition to accomplishing an acceleration of food production in developing countries. The technical and institutional steps which have to be taken are well known. The nature of the constraints has been well identified and these constraints will continue to dominate the scene until national and international action is concentrated on their removal. Other technical reports will continue to be written, meetings will be convened and resolutions passed which take no effect. As the Secretary-General of the United Nations has said "Whether or not we can increase food production depends not on a torrent of words and resolutions but on adopting new and tangible objectives, hammering out the global strategies needed and revitalizing the machinery to achieve them."

B. Improving Consumption and Nutrition

42. An effective solution of the world food problem depends not only on larger food production, but also on its distribution. Hundreds of millions of humans in the present year, 1974, lack sufficient food for growth and health and work, and will continue to be short of food next year and the year after. Must these people be told to wait for the slow-moving processes of agricultural modernization to take effect? They live only once. Sufficient is known about the organization of group feeding programmes, about consumer education, about food fortification and about the direct administration of deficient nutrients, for countries to go ahead and set themselves the objectives of eliminating the more serious incidence of under- and malnutrition within a limited number of years. It is true that there are difficulties in reaching all the classes of people who are suffering deprivation, it is true that there are shortages of trained personnel, but the principal obstacle is neither of these, it is the cost which such programmes would impose on the governments concerned. But if the problem can be reduced to these simple terms surely also it can be solved. Already the world community through bilateral programmes, through UNICEF and the other international agencies and through the voluntary organizations, expresses its concern and contributes to the relief of malnutrition. But much more could be done.

43. It has been pointed out that at least 40 percent of the estimated 460 million undernourished people in the world are children. Isn't it possible to aim at providing supplementary nutrition to at least one quarter of these undernourished children? It will cost only $20 per year to provide 600 additional calories and 20 grammes of protein to each child every day. Another feasible target might be to concentrate on the undernourished population of those least developed countries that are prepared to attach high priority to special feeding programmes for this purpose. Again, it has been calculated that to eliminate the greater part of the diseases directly due to lack of vitamins and certain other nutrients would cost $50 million a year for a ten-year period.

44. These programmes will not solve the nutrition problem of the world overnight, but taken together, they will constitute a meaningful package to reach the most vulnerable of the undernourished population and at a cost that is not unreasonable.

C. The Problem of World Food Security

The Concept of Security

45. Analysis of the trends in world food production indicates that the potential exists for an adequate food supply over the next decade provided that both national and international measures are adopted to increase production and productive capacity. But two factors in particular make it imperative that improvements in food production are accompanied by a system of food security. First, countries differ in their ability to respond to the need for increases in food supplies and in the resources at their disposal for importing the required quantities of food. Secondly, fluctuations in food production, arising primarily from irregular weather patterns, imply that even a satisfactory trend of food availability may be interrupted by periods of shortfall. Indeed the Conference was called primarily because the world faced a serious problem of food security.

46. The breakdown in world food security came about largely because of a system of stockholding which was inadequate to meet an unexpected shortfall in grain supplies in a period of rising demand. The world trading system for grain is dominated by the policies of individual governments with regard to pricing and stocks, and this is likely to continue to be the case in the future. Governments through these policies have a major impact on the allocation of available supplies.

47. Experience has shown that no nation can achieve sustained economic growth and reasonable economic stability in the absence of an assured food supply at reasonable prices. In the developing countries, inadequate food supplies have in many cases brought overall economic growth

to a halt when resources had to be diverted from other development priorities to the imports or acquisition of food to maintain the population. In such crises investment projects have to be abandoned while scarce foreign exchange and external assistance are diverted to short-run survival. What then is the nature of this food security which the nations are seeking and to which the Conference is expected to address itself?

48. During the past 20 years there were always in the background the large surplus stocks held in the grain-exporting countries which could be drawn upon in any emergency. But today the agricultural policies of some of these countries have been revised in order to avoid in the future the accumulation of surpluses. Therefore the burden of whatever is the minimum quantity of stocks of cereals and other foods which the world needs for security will have to be shared among a much larger number of countries. This is the heart of the concept of world food security. It implies a general intent on the part of all countries to establish their own food insurance through stockholding and a willingness to engage in international cooperation regarding the holding and management of food stocks.

49. Security is not costless but as recent events have proved, the absence of adequate security can be even more costly and for all countries. The financing of security represents a burden which must be distributed in an equitable way taking into account the benefits received and the ability to pay for those benefits. This implies inevitably a commitment by developed countries to shoulder a major proportion of the costs of any world security scheme.

50. The fundamental objectives of world food security must be to ensure that all countries:

1) can meet emergencies that occur in an uncertain world without a substantial cutback in supplies of basic foodstuffs to their populations;

2) can rely on the availability of supplies on commercial or concessional terms when formulating their own development strategies;

3) can make production decisions in the agricultural sector in the knowledge of reasonable market stability and the continuance of stable trading relationships.

51. The concept of food security embraces both the reduction of risks emanating from unstable production and also provision of mechanisms whereby individual countries can obtain assistance to meet specific problems of food shortages. It includes the arrangements for security of supplies in the face of production fluctuation, for price stability, for trade expansion, and for payments facilities. The development of a comprehensive solution to the problem of world security involves both individual country action on such matters as stockholding, food aid commitments, and

trade policies, and international action coordinating this national action and supplementing it where necessary by programmes channelled through international agencies. Such a system of food security, if developed, would constitute something in the nature of a charter guaranteeing freedom from famine analagous to the United Nations Charter of Human Rights.

52. The most important elements of a world food security policy may be summarized as follows:

(i) the establishment of a food information and early warning system;

(ii) a coordinated system of national stock policies embodied in an International Undertaking on World Food Security;

(iii) better arrangements for meeting requirements of emergency food supplies; and

(iv) the reorganization of food aid as a continuing form of assistance.

53. The need for a worldwide food information and early warning system is now generally accepted. The establishment of a successful system will however require considerable improvement in data collection services, greater research and analysis to improve man's capacity to understand and forecast the possible impact of weather on food production and the cooperation of all governments to develop the system.

54. Considerable progress has also been made in the past 12 months to seek a consensus on the objectives of minimum world food security on the basis of an International Undertaking on Food Security which provides a certain degree of international coordination and cooperation of national stockholding policies. This will be achieved through agreed guidelines for national stock policies and periodic consultations to ensure the maintenance of a minimum safe level of basic cereal stocks for the world as a whole. The deliberations which have already taken place in FAO to evolve this International Undertaking have shown positive willingness on the part of both developed and developing countries to institute measures along these lines and create an effective food security system.

55. The building up of national grain stocks will create a vital minimum level of security and should be sufficient to cover the more usual and moderate shortfalls in supplies, but from time to time an emergency occurs which is too large to be met by the stocks of the afflicted country. This explains the need for an international policy on emergency stocks comprising stocks, primarily of grains, clearly earmarked for use in emergencies only. Part of the emergency reserve would be held on call in the main exporting countries and part should be pre-located in strategic places around the world.

56. Many developing countries will require concessional food aid on a continuing basis if they are to sustain even a minimum level of food security for their populations. Such aid in the past has been subject to year-to-year fluctuations both because it has been dependent on the supply situation in exporting countries and because variations in world prices introduce an uncertainty into the physical quantities forthcoming. As is well known in the recipient developing countries, the volume of food aid has been cut in half during the past 18 months compared with its average level of the preceding 10 years. The result has been that the governments of developing countries have been obliged to curtail essential programmes of school feeding and other nutritional projects, have had to cancel planned expansion schemes and have had their requests for new food aid projects rejected. At a time when the need is greatest, food aid has fallen sharply.

57. Food aid has justified itself over the past 20 years as a valuable tool for supporting nutritional programmes, for assisting labour-intensive development projects and for dealing with emergency food shortages. These needs will be just as great in the future and there is therefore strong justification for re-organizing food aid on a longer term and more secure basis. It is suggested that to achieve this, governments should accept a concept of forward planning for food aid programmes, say on a three-year basis. It is suggested also that the bilateral and multilateral programmes taken together aim at providing a minimum quantity of ten million tons of grain per year to take care of "hard-core" food aid requirements. The cost of food aid should in future be equitably shared between food-exporting and other high-income countries. Countries whose contributions to food aid take the form of cash rather than of foodstuffs, could either make purchases themselves on the world market, preferably from developing countries with surplus food grains, or donate cash to the World Food Programme to make purchases similarly. Food aid can serve a triple purpose in the circumstances likely to prevail over the next several years. It can make a contribution to food security, through helping countries to build up their national stocks of grain, and through operating part of the proposed emergency reserve. It can make a contribution to easing the balance of payments difficulties of countries which continue facing financial difficulties. Thirdly, it can make an important contribution to relieving hunger and malnutrition and indirectly to the medium- and longer-term progress of the developing countries.

Stabilization of Food Prices

58. One of the most complex issues vital to the World Food Security policy is the stabilization of food prices. While there is general agreement that excessive fluctuations in prices are neither good for the producer nor for the consumer, enhancing the stability of markets is a necessary step toward the establishment of an orderly trading system. But despite several attempts and many different stabilization proposals presented in the past thirty years, the world has not yet evolved an effective system or policy for these objectives. In a way the urgency of finding a new basis for an acceptable stabilization arrangement has increased.

59. The governments participating in the preparation of the draft international undertaking on food security have already taken the first step toward stabilization by agreeing to a system of national stockholding for security but unless they are in a position to take the next logical step and agree on a price policy within which they would operate their respective national stock policies, the proposed food security system can achieve only limited objectives. For example, governments of exporting countries faced with large surpluses and falling prices may be forced to curtail production before the world as a whole has built up adequate security stocks. At the same time, these countries cannot be expected to carry the entire burden of security stocks and also suffer the depressing effects of large stocks on prices. This inherent conflict between the national objectives of many governments and the international requirements for food security and price stability cannot be resolved without some agreed arrangements for stabilizing grain prices.

60. The World Food Conference will not be expected to enter into negotiation on all the complex issues involved in working out a stabilization arrangement but it could greatly facilitate the evolution of such an arrangement if it were to affirm the importance of attaining greater market stability and to agree on the main lines of an approach to a possible international agreement on grains for consideration and further action by governments in the appropriate fora. The main elements proposed for a possible approach to a stabilization arrangement include the establishment of a flexible price range within which there would be no obligations on governments to adjust their stock policies; a mechanism to defend the price range on the basis of an agreed set of rules on stock management and a linkage with food aid policies and with consultations on agricultural adjustment to achieve a longer-term balance between the demand and supply of food. Complementary but more limited arrangements would also be necessary for rice.

Trade Policies in the Context of World Food Security

61. Trade has two important links with food security. The availability of imports of basic foodstuffs plays a major part in offsetting problems of domestic production fluctuations. If backed up by adequate and appropriately managed stocks, trade can relieve developing countries of much of the uncertainty associated with rapid economic change. But the availability of imports of basic foodstuffs has as its counterpart the requirement of adequate foreign exchange resources to pay for such imports. Countries that will need to import food on a regular basis must have export opportunities for their products of both agricultural and non-agricultural origin. Where import costs are irregular, balance of payments facilities must be strengthened to allow developing countries to bear the additional burden of foreign exchange in years when their own production is depressed.

62. At the same time, food-exporting developing countries would need to have assured outlets for their surplus food. This could partly be achieved by triangular deals in which cash resources available for food aid are utilized for purchases in developing countries.

63. Without a trade and payments system which gives to developing countries the same opportunities as are enjoyed by the developed world, food security will be hard to achieve.

D. Implementation and Follow-up

64. While the identification of various elements of the proposed strategy for resolving the world food problem will facilitate the task of the Conference in taking bold and definite action, it is equally important to agree on arrangements that will ensure adequate follow-up and effective implementation of its recommendations and decisions.

65. Many of the actions recommended fall partially or fully under existing United Nations Specialized Agencies, whereas other functions are carried out by ad hoc intergovernmental bodies or not at all. More importantly, there is no direct interrelationship between several bodies with development assistance funds and those various agencies and bodies which formally or informally coordinate national and international policies on food aid and food security.

66. It would be unrealistic to suggest the creation of a "supranational" body or organization which will oversee everything and monitor national policy or actions in all the fields. What is essentially needed is a mechanism that will provide sustained and effective support to national action necessary to achieve the desired objectives and at the same time facilitate coordination of international actions and policies in all the related and complementary areas. It has therefore been proposed that the World Food Conference consider the creation of a new body, perhaps to be called a "World Food Authority", to implement or coordinate the implementation of the appropriate recommendations and decisions of the Conference. Such an authority could have essentially three functions: (a) to mobilize international financial assistance for agricultural development in developing countries including assistance from new sources which may not be equipped to channel such funds individually: using existing channels of disbursement and technical support where feasible; (b) to provide support to a wider system

of world food information and food security and to facilitate the observance of the International Undertaking on World Food Security, and (c) to facilitate the implementation of the longer-term food aid policy proposed for adoption by the Conference. The precise structure and organization of the proposed Authority would require a great deal of further discussion among the governments concerned, but it could consist of:

(i) A permanent intergovernmental Council, with half its members elected by the United Nations General Assembly and the other half by the FAO Conference.

(ii) An Agricultural Development Fund, to provide grants, soft loans and commercial loans for increasing food production in developing countries, mainly through existing institutions, but with its own Board of Directors responsible to the Permanent Council, with weighted voting rights in proportion to contributions.

(iii) A Committee on Food Information and Food Stocks to facilitate the observance of an International Undertaking on Food Security.

(iv) A Committee on Food Aid to facilitate the implementation of the long-term food aid policy being recommended to the Conference.

67. It must be emphasized that such a new authority would not become another special operating agency of the United Nations, nor would it take over the functions of the existing specialized organizations. Indeed, the main purpose of the authority would be to strengthen effective action by existing agencies and to provide a mechanism whereby governments can better coordinate international actions and policies in the three interrelated fields of food production, food security and food aid.

A Strategy for International Action

68. In order to deal with the current and impending world food problem within the broad framework of development, effective action must be taken by the World Food Conference with recommendations for appropriate arrangements for implementation. As already mentioned, these priority actions have to proceed on two fronts simultaneously: (i) world food production policy; (ii) world food security policy, which taken together could lay the foundations of a World Food Policy. Neither can be effective in the absence of the other. There can be no food security if there is not more food production.

69. Fortunately the harvests in the current year are generally above average and in some countries very good and as a result the prospects of a disastrous physical shortage have receded, even though food prices could remain high and shortages in some countries could persist through 1974, until stocks are rebuilt, hopefully in 1975. But there does exist a serious shortage of fertilizer and pesticide and some effective action is necessary to ensure an adequate supply of these inputs in developing countries in the next two years.

70. Having taken steps to prevent an immediate collapse in the food production of developing countries, governments must proceed rapidly to bring into existence the other elements of a World Food Security System. The first and principal component must be the building up of a stock of cereals sufficient to cover normal year to year fluctuations at the world level.

71. Simultaneously the governments will face one additional urgent task - to recommend a policy for the future of food aid to meet more adequately its triple objectives of filling emergency needs, supplementing nutrition and providing additional resources for local development.

72. These major components of the World Food Strategy in the short run would have to be supplemented by the medium and long-term elements, i.e. expansion of special nutrition programmes on the lines indicated already and measures to increase production in developing countries. The steps needed to bring about an improvement in food production in developing countries are not startlingly new but have been presented to highlight the complex interrelationships in the task of agricultural development and also to underline many specific programmes which deserve higher priority. An attempt has also been made to identify the main obstacles that need to be removed to permit faster progress in future. For some countries a substantial increase in the availability of financial resources and of essential inputs would enable them to achieve their production goals, others would need expanded markets to improve or sustain production, but a large number of them, particularly those with a serious shortage of trained manpower and appropriate institutions would need a much longer period of time and sustained assistance of the right kind, to break the real barriers to progress. The combination of national and international action that will be required to achieve specific goals or targets would differ not only with the sector or sub-sector that is involved but with different countries and regions. The proposed strategy for resolving the food problem is comprehensive yet flexible enough to meet these varying requirements.

73. The World Food Conference is invited to:

- endorse the main elements of the above strategy;
- recommend how the strategy as a whole and its various parts should be implemented; and
- indicate how the additional resources required for its implementation should be mobilized.

Section I

MEASURES FOR INCREASING FOOD PRODUCTION IN DEVELOPING COUNTRIES

Chapter 1

Objectives and Priorities

Setting

74. The salient features of the Assessment of the World Food Situation, presented 1/ to the Conference constitute the basis for the action proposals now set forth. The Assessment indicated two basic food problems which have to be tackled by the world community. One is the threat of the acute food shortages or of serious instability in food prices and supplies occurring from time to time in particular regions all over the world as a whole; this problem is dealt with in Sections III and IV of this document. The other is the endemic hunger of the poorest people of the world whether they live in rural areas as most of them do or in the slums of the major cities.

75. Looking to the future the analysis in the Assessment concluded that both these dangers are likely to become more serious in the years ahead unless timely corrective action is taken. The stocks of cereals on which the world had depended for 20 years are unlikely to be reconstituted in their previous form and therefore some alternative framework of food security has to be evolved. The extent of chronic hunger and malnutrition may increase in the absence of corrective action, because food demand for the developing countries as a whole is likely to expand at about 3.6 percent per year between 1972 and 1985 while food production in these countries has been increasing at an average of 2.6 percent in the past twelve years.

76. The consequence of these trends, if they were allowed to continue, would be an increase in the cereal imports of the developing countries from an annual average of 30 million tons in the years 1969-71 to some 90 million tons in 1985. In years of bad harvests the food gap in the developing countries might be even higher. In addition there would be deficits in many foodstuffs other than cereals. This is a frightening prospect. The financing of food transfers on this gigantic scale would far exceed the payments capacity of the majority of food deficit developing countries and the whole process of economic growth of these countries might come to a standstill; poverty and hunger would become more widespread than they are today.

77. The only viable strategy for effectively tackling the food problem in the future is, therefore, to put the maximum possible priority on objectives, policies and programmes for increasing food production within the developing countries, and to achieve rates of growth substantially above recent trends. This strategy is not just based on hopes and expectations,

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1/ Document E/CONF 65/3 for the World Food Conference "Assessment of the World Food Situation - Present and Future"

but it is supported by an analysis of the potentials for food production which await exploitation in the developing countries. For example, the more widespread and intensive use of fertilizers, pesticides and good quality seeds could increase average per hectare yields by at least 50 percent in a great many developing countries within a reasonable period of time. In some countries, especially some Latin American and African countries, substantial areas of additional land could be brought into cultivation; in all regions water could be harnessed for irrigation purposes. By improving the quality of rangelands and by other measures to augment food supplies, larger numbers of more productive livestock could be maintained. Fish supplies could be increased from the underexploited seas, from reductions in wastage and from aquaculture. Cereal supplies could be increased by the reduction of post-harvest losses through better storage and through modified milling techniques. The determination to achieve all these things could be built up through the mobilization of rural people to work for their own betterment and through a strengthening of rural institutions, credit and other agricultural services. In short, there is no lack of opportunities for accelerating the expansion of food production; it is rather a question of choosing the right strategies and implementing them through effective programmes.

Objectives of Production Policies

78. The objectives of accelerating the expansion of food production in developing countries is vital for several reasons. First, the larger production of food, especially on the part of small and subsistence farmers, will improve the nutrition of their families which at present is gravely deficient. Second, an increase in output will increase farm incomes and as a consequence will increase the level of economic activity in the rural areas and so stimulate additional employment. Third, a larger food output will contribute to progress in overall national development either through lessening the need for food imports or by expanding the volume of food exports.

79. The production challenge facing the developing world is not the same in all regions and countries. The extent of the output increase needed in different regions can be discussed in the light of Table 1 which shows, for the various developing regions, the projected growth rates of population and of food demand over the period 1970–85, along with extrapolated trends of food production.

Table 1: Projections and extrapolations to 1985 of food demand and production in developing countries.

	Demand Growth		Extrapolated Food Prod.	Population Growth
	High Income	Trend Income		
	(. . . . . percent per year, compound . . . . . .)			
Developing Market economies	4.0	3.6	2.6	2.7
Africa	4.1	3.8	2.5	2.9
Far East	4.0	3.4	2.4	2.6
Latin America	3.8	3.6	2.9	2.8
Near East	4.2	4.0	3.1	2.9
Asian Centrally Planned Economies	3.5	3.1	2.6	1.6
All Developing Countries	3.8	3.4	2.6	2.4

Source: FAO estimates, see Document E./CONF. 65/3.

80. If the trend growth rates of food production are compared with population growth, it is apparent that the gap is widest in Africa and in the Far East, where food production has been growing more slowly than population. The food production situation in these two regions is thus more critical than in Latin America and the Near East, where the extrapolated rate of food production growth is higher than the rate of population increase. The Asian centrally planned economies are in the most favourable situation in this respect because their expected population increase rate is much lower than in other regions, and substantially lower than the extrapolated growth of their food production.

81. The challenge to the developing regions caused by the demographic explosion is, perhaps, the most difficult one to tackle. The World Population Conference this year is expected to discuss the food and population balance and related issues and its deliberations will be of interest to the World Food Conference. While changes in demographic policy and behaviour come into effect with a time lag of 15-20 years or more, and would thus have little effect on the number of people likely to need food between now and 1985, the gravity of the challenge posed to food supply required to feed the growing population should be urgently recognized and policies for population control formulated and implemented. In the absence of such policies, the land, water, agricultural and other resources of this world may find it increasingly difficult to feed a continuously growing population beyond the year 2000.

82. Demand projections based on the high income alternative, namely 4 percent per year for all developing market economy countries, ranging from 3.8 percent for Latin America to 4.2 percent for the Near East, would require a corresponding and sustained increase in food production at this rate. The Strategy for the Second Development Decade also has its agricultural target at this level. The demand increase based on the trend rate of income growth gives lower figures - 3.6 percent per annum - which could be considered to be the minimum rates that the developing countries considered as a group must attain in their food production increase. If the production increase falls below this minimum rate of 3.6 percent per year, varying from 3.4 percent for Asia to 4 percent for the Near East, then not only will food deficits increase above their present levels, but there will be no significant improvement even in the average intake of calories and proteins, and there will perhaps be an increase in the number of hungry and undernourished people, particularly in the least advantaged countries.

83. In the individual countries within each region, food demand is growing at a different speed, partly for population reasons and partly for income reasons. There are some developing countries in which population is growing at less than 2 percent per year while in others it is growing at more than 3.5 percent. In some countries per caput incomes are growing at over 5 percent per year while in others income is not growing at all. In cases where the low rate of population growth happens to be combined with a slow growth in income, one may find total food demand increasing over a fifteen-year period up to 1985 by less than 30 percent; however, in the majority of developing countries demand is expected to increase by something close to 70 percent, as noted in the Assessment, and in a few countries it will more than double in this period.

84. These figures provide the dimensions of additional effort and achievement that the developing countries in different regions face. If their dependence on imported food is not to increase, the different regions must aim to raise their food production growth rates on a sustained basis above the recent trends, by over 50 percent in Africa (i.e. from 2.5 percent per annum to at least 3.8 percent), over 40 percent in Asia and the Far East, 30 percent in the Near East and nearly 25 percent in Latin America. In the Asian centrally planned economies, the growth rate needs to be accelerated by at least 20 percent. These should be considered the minimum scale of effort, which will still fall short of achievement of the overall goal of 4 percent annual increase in agricultural production targeted in the DD2 Strategy.

85. The objectives and strategy for accelerating the increase of food production in developing countries cannot be determined in isolation from the rest of the economy. They have to be formulated consistently with the goals and policies for economic and social development in each country. There is also a reciprocal relationship. In view of the dominant role of agriculture in the economies of most developing countries it is, in fact, the transformation of agricultural production and rural

structures that will significantly influence the wider framework of national development.

86. Food output targets, though essential, will not be enough since the purpose of the production effort is not only to meet the demand of the urban population, but also to increase the food consumption levels of the undernourished groups of the rural population itself. This means that the production policies must include policies and programmes to bring the small farmers and agricultural workers into the income and employment streams, through appropriate institutional and structural changes, the adaptation of improved food production technologies for adoption by small farmers, the training of small farmers on a mass basis and the launching of comprehensive rural development programmes in specific areas. . One major strategy for eliminating hunger must be an overall employment policy as part of each nation's general development policy.

87. The objectives of food production policies can be generally stated as follows:

(a) sustained expansion in productive capacity, to meet the growing food demand and the requirements for stocks and for supplementary feeding programmes;

(b) achievement of a stable balance between population and food supply;

(c) improving the nutritional status of the people in low income and vulnerable groups;

(d) provision of increasing opportunities to the small farmers, tenants and labourers to effectively participate in food production and other economic activities, through land reform and other changes in the rural institutional structure and services, and

(e) alleviating poverty, unemployment and underemployment through integrated development of rural areas.

88. Justice, equity and the fundamental right of each individual to have adequate food and nutrition should be emphasized as the fundamental objectives of food and agricultural development.

National Responsibilities

89. The responsibility for taking action lies with the government of each developing country. After a careful assessment of their long-term food supply problems and a review of the socio-economic conditions in the rural areas, governments need to re-examine critically their policies for the farm sector, with a view to sharpening the impact of existing programmes and devising new ones to help accelerate the expansion of agricultural production and the needed improvements in food consumption.

90. The governments of most developing countries are aware of the challenge. In fact, the current development plans of most of them show food or agricultural production growth targets well above the recent trend rates. It is not, however, a simple question of improving the plan arithmetic; it is a question of political commitment, of bold policies, realistic programming, adequate mobilization of domestic resources, acceleration of institutional change and effective implementation and administration, backed by the needed support from bilateral and multilateral sources of external assistance.

91. Indeed, external assistance for food production cannot be fully effective until the countries concerned have exercised their responsibility to formulate food production objectives and consumption goals in the context of their development planning processes. They will have to attach the highest possible priority to achieving these objectives and goals within the wider framework of their economic and social development. Moreover, international assistance will not go very far unless governments make their maximum effort to mobilize domestic resources in the form of increased saving, trained manpower, and the participation of the rural people in the development process. This will require in some cases appropriate improvements in the monetary and fiscal system, the strengthening of administration and training, the improvement and expansion of statistical information and the promotion of organizational arrangements to facilitate people's participation. Governments must set the prices of farm products at levels which provide incentives to production and must take steps to improve the marketing and distribution systems which by reducing margins would stimulate output and consumption. They must also place high priority on institutional changes necessary to broaden the base of the food production system and bring about rural development encompassing all sections of the population.

92. Although in the following chapters the emphasis is constantly on accelerating the rate of growth of food production, it does not follow that each individual country should wish to maintain its present level of self-sufficiency in food supplies nor is it necessarily desirable that all developing countries should aim at a 100 percent self-sufficiency. For one reason, their resource endowment differs as regards agricultural land. Some countries with high population densities will find it difficult to aim at self-sufficiency in food supplies. Others, especially in Africa and parts of Latin America, have large areas of land still awaiting agricultural settlement. There are some countries which have the physical capacity to increase their agricultural production substantially but they may find it more profitable to purchase much of their food from abroad. There are some other countries which have for many years specialized in the export of one or a few agricultural commodities and would like to continue expanding in the same direction if only international market stability could be ensured; but as long as world markets remain uncertain and unstable, these countries may prefer to diversify away from agricultural exports at the price of a less rapid increase in productivity.

93. As emphasized, each nation must work out its own goals and fix its own agricultural development targets. It seems probable that every developing country will wish to achieve some expansion of its food production, partly because of the population explosion, partly to relieve world hunger and poverty, and partly, in most but not all countries, because of mounting difficulties in the balance of payments. In each case, once the goals are determined, the government will need to formulate production strategies and organize a series of subject matter programmes to implement the strategies. These subject matter programmes are described in Chapters to covering agricultural inputs, land and water resources, livestock and fisheries, research, technology and rural development.

94. Not many of the proposals for action put forward for accelerating food production in this document are novel. Most developing countries already have numerous reports prepared by national and international bodies outlining what needs to be done but a multiplicity of constraints prevent such programmes from being carried out. One of the most positive steps that can be taken in each country will be to identify the nature of the obstacles and to devise measures for overcoming them.

95. Perhaps the most pervasive shortage in the developing countries, in all technical disciplines and in all branches of administration, is the paucity of trained manpower. A country may be rich in terms of money, may be rich in physical resources, but if it does not have enough plant breeders, veterinarians, extension agents and people capable of running credit cooperatives it cannot launch meaningful agricultural programmes. One of the biggest single obstacles to agricultural modernization can be overcome by devoting resources to the training of people at all the levels of competence from the most humble to the highest. All training does not have to be formal and sophisticated. In fact for a large majority of activities informal and on the job training programmes, geared to the needs of the community or a particular region, is often more appropriate.

96. A second constraint of major significance involves the difficulty in mobilizing more funds for investment in the farm sector and in enabling farmers themselves to increase the capital requirements of their enterprises. But it also has its international aspect because the majority of the programmes, including for example works involved in bringing large areas of new land into cultivation as well as the support of farm credit for small-scale farmers, will require massive financial support which can come largely from external sources.

97. Yet another obstacle relates to the markets for agricultural exports of developing countries which have for many years been becoming more and more precarious, so that the opportunities for earning foreign exchange by these means are not expanding at a rate which would enable these developing countries to finance their general economic development planning. If this group of countries is not to be forced back into the pursuit of food self-sufficiency, greater efforts at an international level must be made to expand the access to markets in developed countries and increase the element of market stability.

98. These and other constraints which could be mentioned do not operate with equal intensity in each and all of the developing countries. Just as each country differs from its neighbour concerning the ratio of population to physical agricultural resources, so each country has its own package of constraints. There are for example a few developing countries, notably some of the oil exporters, where at the moment money is no constraint at all, but where shortage of trained technicians and administrators prevents a fuller use of the financial resources. There are other countries which, by reason of their political or historical association with one or more developed countries, possess secure outlets for their agricultural exports, but they lack financial resources for the modernization and amplification of agricultural export activities. It is for each country to identify the nature and intensity of the obstacles which stand in the way of realizing its desired programmes of agricultural expansion. The next step is to review the possibilities of overcoming the obstacles, through internal efforts and with international support.

International Cooperation and Assistance

99. The main lesson of the food crisis of the last few years has been that the food problem of most developing countries cannot be solved by the governments of those countries alone, though they must retain primary responsibility for it. Food has clearly emerged as a world problem and will increasingly require a framework of world policy for cooperation in production, consumption, security, trade and adjustment. The World Food Conference will have made a signal contribution if the governments represented there achieve agreement on such a framework and issue a mandate for its implementation through appropriate organizations and arrangements. The contents of such a world policy, in so far as they relate to consumption, security, trade and adjustment are dealt with in later chapters. This section concentrates on the elements of international cooperation and assistance needed for achieving the production objectives.

100. The adoption in 1970 by Member Governments of the United Nations of the International Development Strategy for the Second Development Decade (DD2) provided a broad framework for joint and concerted action by developing and developed countries to promote the modernization and transformation of the world's food and agricultural sector. The broader objectives agreed in this global strategy are to bring about more equitable distribution of income and wealth for promoting both social justice and efficiency of production, to raise substantially the level of employment, to achieve a greater degree of income security, to expand and improve facilities for education, health, nutrition, housing and social welfare and to safeguard the environment. Recognizing that economic growth has to go hand in hand with qualitative and structural changes in the society, the Second Development Decade Strategy envisages that each developing country should pay particular attention in its policies and plans to significant reductions in unemployment and underemployment, and to improving the level of nutrition in terms of the average calorie intake and the protein intake, giving special attention to the needs of the vulnerable groups of the

population and the well-being of children. The Economic and Social Council in a subsequent Resolution in 1972 (1707 (LIII) urged governments to consider agrarian reform as an important and integral part of national strategies for the attainment of the objectives of DD2.

101. Within these broad objectives, the quantitative goal of an average annual rate of growth of at least 6 percent in the gross product of developing countries and 3.5 percent in gross product per head has been specified. This implies an average annual expansion of 4 percent in agricultural output. The details of the policy measures required for achieving these goals were also laid down in a number of fields, including international trade, financial resources and aid for development, invisibles including shipping, science and technology and special measures in favour of the least developed and land-locked countries.

102. Available evidence of the progress achieved in the first three years of the Second Development Decade indicates shortfalls from the target of 6 percent rate of growth in gross product and the implied 4 percent growth in gross product growth rate in agricultural output. Progress in the achievement of the non-quantified economic and social objectives relating to improvements in employment and income distribution, in food consumption, nutrition and level of living and generally in human development, has apparently received a set-back on account of the shortfall in the overall and agricultural growth rates as well as other developments. Specially notable among the general factors which have adversely affected many developing countries are the unprecedented inflation, particularly in the developed countries, exchange rate and monetary instability and inadequate implementation of most of the policy measures included in the DD2 Strategy.

103. The first preoccupation of developing countries is with the current difficulties besetting them; their inability to find on world markets the fertilizers, pesticides and herbicides which they need to maintain present levels of food production, the fact that a number of their nutritional or developmental projects involving food aid has been curtailed or cancelled because of reduced food aid avialabilities, the acute balance of payments problem facing many developing countries as a result of the energy crisis and the high prices of many other commodities. These are difficulties which no individual country can resolve by unilateral action at national level. The solutions can be found only through the willingness of governments to cooperate at international level.

104. The Sixth Special Session of the UN General Assembly on Raw Materials and Development expressed concern about these and other matters in its Declaration on the Establishment of a New International Economic Order, and adopted a comprehensive ten-point Programme of Action. Many elements of the DD2 Strategy are elaborated further in some of these Action Programmes, such as those relating to the fundamental problems of raw materials and primary commodities as related to trade and development, international monetary system and financing of development, industrialization, transfer of technology, promotion of cooperation among developing countries and strengthening the role of the UN System in the field of international economic cooperation.

105. Among other and new elements of the Action Programme, of particular interest to the World Food Conference is the launching under UN auspices of a Special Programme for providing "emergency relief and development assistance to the developing countries most seriously affected, as a matter of urgency, and for the period of time necessary, at least until the end of DD2, to help them overcome their present difficulties and to achieve self-sustaining economic development". Effective implementation of these Action Programmes is essential for the solution of the food problem in the short, medium and long term; and urgent importance attaches to the success of the Special Programme.

106. In the following chapters of this Section, recommendations for national and international action are developed in selected areas of key significance for accelerating the expansion of food production in developing countries. Since the priorities for action differ in each country, according to its resources, stage of development, objectives and policies, no attempt has been made to present comprehensive recommendations at the national level. There are, however, some basic similarities within regions. In view of this, Chapter 7 presents a discussion of the strategies and priorities appropriate in different developing regions. The main concentration, however, is on proposals for international action. Since not all aspects of food production development are equally susceptible to international action, a selective approach is essential. Proposals for action in the form of an international policy, programme, institution or fund have been developed with respect to the development of land and water resources; the supply and distribution of fertilizers, pesticides, seeds and associated credit; the control of the tse-tse fly as a major programme in Africa; and the promotion of agricultural research and technology for food production.

107. Estimates of the external resource requirements for implementing desirable and feasible national action as well as the recommended international action programmes for accelerating food production are indicated in the relevant chapters and summarized in Chapter 8. The aggregate financial and technical assistance involved considerably exceeds the available estimates of the current flow of such assistance from bilateral and multilateral sources for agricultural development. Indeed, the chief impact of the proposals put forward in this document is to be sought in the magnitude of the additional international effort envisaged and the proposed coordination of its implementation through the UN system, rather than in the novelty of the ideas themselves.

108. The international cooperation for agricultural development in the developing countries proposed in this Section, and indeed in the whole document, should be seen as part of the implementation of the International Development Strategy for the Second Development Decade and of the Programme of Action for the Establishment of a New International Economic Order. Since neither of these international strategies specifies the requirements for assistance in the food and agricultural sector, the latter could be seen as a supplement to, or further elaboration of, the relevant parts of the former.

109. Keeping all these aspects in view, the World Food Conference may wish to:

(i) Adopt a statement of objectives of food production, emphasizing among other things, (a) sustained expansion in productive capacity, to meet the growing food demand and requirements for security stocks and nutritional programmes; (b) achievement of a stable balance between growth of population and of food supply; (c) improving the food consumption levels of the people in low income groups; (d) provision of increasing opportunities for the small farmers and landless workers to participate effectively in modernized food production and other economic activities; (e) alleviating poverty, unemployment and underemployment through integrated development of rural areas.

(ii) Urge governments to accept the removal of the scourge of hunger and malnutrition which affects millions of human beings, as the common responsibility of the international community as a whole.

(iii) Set an indicative goal of food production increase till 1985 in different developing regions estimated at the following minimum annual rates; 3.8% for Africa, 3.4% for Asia and the Far East; 3.6% for Latin America and 4.0% for the Near East.

(iv) Call on each developing country to formulate its own food production objectives and goals for the short, medium and long term, taking into account its demographic and general development objectives and establish a minimum essential framework of objectives, policies and institutions for agricultural development to enable external assistance to be fully effective.

(v) Urge governments of all countries - developed and developing - to take appropriate steps to implement the Programme of Action adopted by the Sixth Special Session of the UN General Assembly and, in particular, to respond to the Secretary-General's appeal for contributions to the Special Programme, the urgent implementation of which is essential for ensuring progress in resolving the food problem of the developing countries seriously affected by the economic crisis.

(vi) Recommend to the 1975 Special Session of the General Assembly on Development that in adapting or reformulating the specific development goals and policies for the second half of the Decade, the objectives and strategy for food production, consumption, security, trade and adjustment (as adopted by the Conference) be fully taken into account and appropriately emphasized.

Chapter 2

Fertilizers and Other Inputs

A. Fertilizers

110. In the present state of agricultural technology, chemical fertilizers constitute one of the most important single means to increase food production. Increasing application of fertilizers is a key element of the package that has made possible most of the increase in agricultural productivity achieved over recent years. The successes of the high-yielding varieties of wheat and rice derive from the fact that they are highly fertilizer-responsive. Consumption of fertilizer in developing countries, although still relatively low, has been doubling every five years. A serious deficit in the physical supplies of fertilizer available for the continuing expansion of usage in developing countries, therefore, must be considered as nothing less than a major world problem.

111. That such a problem is developing is indicated by the current shortage and high prices of fertilizers, as well as by the underlying longer-term trends of supply and demand. In 1972/73, the last year for which complete statistics are available, the world as a whole produced and consumed about 80 million tons of fertilizer nutrients (nitrogen, phosphate and potash). Developing countries consumed about 11.5 million tons, but produced only about 6 million tons, importing the remainder from developed countries. Of the main fertilizer nutrients, developing countries produced about 60 percent of their nitrogen and phosphate consumption, but less than 20 percent of their potash consumption.

112. In the longer term, world consumption of fertilizers is expected to grow by 6-7 percent per year through 1980/81. A World Bank study indicates that effective demand by developing countries (excluding centrally planned countries of Asia) will grow by about 11 percent per year, as compared with a growth of 13 percent per year between 1962/63 and 1972/73. The developing countries are thus expected to more than double their consumption of nitrogen and phosphate nutrients from 9.6 million tons in 1972/73 to 22.6 million tons estimated in 1980/81 1/. Including the requirement of the centrally planned countries of Asia, the demand would increase to 31.6 million tons in 1980/81 compared with actual consumption of 13.3 million tons in 1971/72.

113. A number of broad assumptions underlie these estimates of fertilizer requirements. The estimates are of potential "effective demand" or "consumption" of fertilizer rather than "fertilizer needs" in the normative sense of the term, but it has been assumed that fertilizer availability will not be a constraint on consumption. Implicit in this approach, of course,

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1/ Potassium is not considered in the long-term projections as it is not expected to present a supply problem.

is the expectation that national policies will continue to provide support for the continued development of effective systems of fertilizer distribution, credit, research and extension in fertilizer usage, and that the pace of improvements already achieved in these areas in some of the major consuming developing countries will be maintained in the future.

114. The most rapid growth in consumption is expected to be in the developing countries of Asia and Africa at about 12-13 percent per year (see Table 2). The Asian region will consume 68 percent of the nitrogen and phosphate fertilizers consumed in the developing world. Latin America is projected to experience somewhat lower annual growth rates in consumption.

Table 2 - Regional distribution of nitrogenous and phosphatic fertilizer consumption - actual and projected 1971/72 and 1980/81

(figures in million metric tons of plant nutrient and percentages)

	Nitrogen	Phosphate	Total N+P
Developing Countries of Asia			
1971/72	4.0	1.4	5.4
1980/81	11.0	4.4	15.4
Annual percentage growth rate 1971/72-1980/81	11.9	13.9	12.4
Latin America			
1971/72	1.4	1.0	2.4
1980/81	3.0	2.0	5.0
Annual percentage growth rate 1971/72-1980/81	8.8	7.8	8.7
Africa			
1971/72	0.4	0.3	0.7
1980/81	1.4	0.7	2.1
Annual percentage growth rate 1971/72-1980/81	14.9	7.3	12.9
Total Developing Countries			
1971/72	5.8	2.7	8.5
1980/81	15.5	7.1	22.6
Annual percentage growth rate 1971/72-1980/81	11.5	11.1	11.5

Source: World Bank Group Report No.446 "Fertilizer Requirements of Developing Countries" Annex I: Table 3. 1971/72 data: FAO

115. The projected consumption of 22.6 million tons of fertilizer in 1980/81 would be broadly consistent with a growth in agricultural output of 3.6 percent per year, which is below the 4 percent target set for the Second Development Decade. In order to reach the 4 percent target, an additional 15-20 percent of nitrogen and phosphate would have to be consumed by developing countries.

Production Gaps in Developing Countries

116. To meet the goal of 22.6 million tons of nitrogen and phosphate consumption in 1980/81, however, the developing countries will have to secure annually about 8 million tons of nitrogen and about 4 million tons of phosphates over and above the production that can be expected from existing capacity, and from new capacity that is firmly committed at this time 1/. About 76 percent of the total production gap of 12 million tons for the developing countries relates to the Asian region, while the corresponding figures for Latin America are 19 percent, and for Africa 5 percent. The projected gaps for developing countries by main regions are shown in Table 3.

117. In theory, these gaps could be filled either by additional production in the developing world (but not necessarily in each individual country), or by imports from the developed countries. However, it now seems unlikely that the developed countries will be in a position to fill the entire fertilizers gap in developing countries by 1980/81. Information available as of September 1973 suggested that in the developed countries existing fertilizer facilities plus planned new facilities which were firmly committed as of that date, would be capable of producing around 35 million metric tons of nitrogen nutrient and 19 million metric tons of phosphate nutrient for fertilizer purposes. On this basis, the potential fertilizer "production gaps" (defined as projected 1980/81 consumption minus the total of production from existing facilities plus new facilities for which firm commitments have been made), within the developed countries were estimated at about 5-6 million metric tons each for nitrogen and phosphates. For the world as a whole, this would have implied a deficit of 19 and 10 million tons for nitrogen and phosphates respectively in 1980/81 (Table3).

118. The recent spurt in prices has however generated large new investment in fertilizer capacity in developed countries since September 1973. These additional commitments, according to one estimate, would add about 10 million tons nutrient of nitrogen and phosphate mainly in developed countries by 1980/81, thereby reducing the projected gap of developed countries to four million tons, and the projected world gap from 29 to 19 million tons.

1/ Firmly committed capacity consists of new capacity that is planned,for which financing has been secured.

Table 3 - Projected demand and production of nitrogenous and phosphatic fertilizers in 1980/81, compared to corresponding consumption and production in 1971/72

	1971/72			1980/81		
	N	P	Total	N	P	Total
	(..... million tons of plant nutrients .....)					
DEVELOPED REGIONS						
North America						
Consumption/Demand	7.7	4.7	12.4	12.4	7.3	19.7
Production	8.9	6.3	15.2	9.3	6.6	15.9
Surplus (+) Deficit(-)	+1.2	+1.6	+2.8	-3.1	-0.7	-3.8
Western Europe						
Consumption/Demand	7.1	5.9	13.0	9.8	7.1	16.9
Production	8.6	6.4	15.0	9.8	5.1	14.9
Surplus (+) Deficit(-)	+1.5	+0.5	+2.0	-	-2.0	-2.0
Eastern Europe						
Consumption/Demand	3.1	2.2	5.3	6.9	3.9	10.8
Production	3.6	2.0	5.6	6.8	2.1	8.9
Surplus (+) Deficit(-)	+0.5	-0.2	+0.3	-0.1	-1.8	-1.9
U.S.S.R.						
Condumption/Demand	5.2	2.4	7.6	9.7	3.8	13.5
Production	6.1	2.8	8.9	5.9	2.8	8.7
Surplus (+) Deficit(-)	+0.9	+0.4	+1.3	-3.8	-1.0	-4.8
Other Developed Regions						
Consumption/Demand	1.0	2.1	3.1	1.6	2.7	4.3
Production	2.5	2.1	4.6	3.3	2.3	5.6
Surplus (+) Deficit(-)	+1.5	-	+1.5	+1.7	-0.4	+1.3
Total Developed Regions						
Consumption	24.1	17.3	41.4	40.3	24.7	65.0 1/
Production	29.7	19.6	49.3	35.1	18.9	54.0
Surplus (+) Deficit(-)	+5.6	+2.3	+7.9	-5.2	-5.8	-11.00
DEVELOPING REGIONS						
Developing Asia						
Consumption/Demand	4.0	1.4	5.4	11.0	4.4	15.4
Production	2.3	0.7	3.0	4.6	1.5	6.1
Surplus (+) Deficit(-)	-1.7	-0.7	-2.4	-6.4	-2.9	-9.3
Latin America						
Consumption/Demand	1.4	1.0	2.4	3.0	2.0	5.0
Production	0.8	0.5	1.3	1.9	0.8	2.7
Surplus (+) Deficit(-)	-0.6	-0.5	-1.1	-1.1	-1.2	-2.3
Africa						
Consumption/Demand	0.4	0.3	0.7	1.4	0.7	2.1
Production	0.1	0.4	0.5	0.6	0.9	1.5
Surplus (+) Deficit(-)	-0.3	+0.1	-0.2	-0.8	+0.2	-0.6
Sub-total Developing Countries						
Consumption/Demand	5.8	2.7	8.5	15.5	7.1	22.6
Production	3.2	1.6	4.8	7.1	3.3	10.4
Surplus (+) Deficit(-)	-2.6	-1.1	-3.7	-8.4	-3.8	-12.2

Figures may not add exactly to totals due to rounding.

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Table 3 (Continued)

	1971/72			1980/81		
	N	P	Total	N	P	Total
	(..... million tons of plant nutrients .....)					
DEVELOPING REGIONS (Cont'd)						
Centrally Planned Economies in Asia						
Consumption/Demand	3.4	1.1	4.5	7.2	1.9	9.1
Production	2.1	1.1	3.2	1.9	1.1	3.0
Surplus (+) Deficit(-)	-1.3	-	-1.3	-5.3	-0.8	-6.1
Total Developing Regions						
Consumption/Demand	9.2	3.8	13.0	22.6	9.0	31.6
Production	5.3	2.7	8.0	9.0	4.4	13.4 1/
Surplus (+) Deficit(-)	-3.9	-1.1	-5.0	-13.6	-4.6	-18.2
Total World						
Consumption	33.3	21.1	54.4	62.9	33.7	96.6
Production	35.0	22.3	57.3	44.1	23.3	67.4 1/
Surplus (+) Deficit(-)	+1.7	+1.2	+2.9	-18.8	-10.4	-29.2

Source: World Bank Group Report No.446: "Fertilizer Requirements of Developing Countries" Annex I: Table 3. For 1971/72 data: FAO

1/ These figures are based on the production capacity as of September 1973. Taking into account the additional production capacities firmly committed between September 1973 and April 1974, the production in developed countries in 1980/81 is likely to be around 38 million tons of nitrogen nutrient and 22 million tons of phosphate nutrient. This would still leave production gaps in developed countries as a group of about 2 million tons each for nitrogen and phosphates. For the world as a whole, the deficit in 1980/81 would be somewhat reduced but remain quite substantial, i.e. 12 and 7 million tons for nitrogen and phosphates respectively.

Notes: (a) Production figures above are based on intermediate capacities, i.e. ammonia capacities in the case of nitrogen and equivalent intermediate in the case of phosphates reflecting all net process phosphoric acid plus imported proportions of normal superphosphates (100%), nitrophosphates (70%) and TPS (30%).

(b) The figures of demand for N and P in 1980/81 in the above table represent estimates of the World Bank Group. For the sake of comparison some other estimates of demand are shown below:

	Developing countries (Excl.centrally planned countries of Asia)			Developed countries		
	N	P	Total	N	P	Total
World Bank Group	15.5	7.1	22.6	40.3	24.7	65.0
UNIDO	13.5	6.5	20.0	48.9	29.0	77.9
British Sulphur Corporation	12.6	7.5	20.1	41.5	29.1	70.6
Tennessee Valley Authority	12.8	6.0	18.8	40.7	24.8	65.5

119. Even after this rapid spurt in new investment in fertilizer capacity, there is a large uncovered gap in the expected requirements and likely supply, particularly in developing countries. The actual magnitude of this gap would of course depend on the rate at which the expansion of fertilizer capacity actually takes place in the next 4-5 years. The situation is changing very rapidly, and it is very hazardous to forecast the actual gaps in 1980/81. There are, however, a variety of factors which will determine the future supply/demand balance, including notably the persistence of high fertilizer prices, the ability of traditional producing countries to assure themselves of feedstock supplies on a long-term contract basis, and the initiatives taken to build new capacity in both developing and developed countries.

Current Problem and Short Term Action

120. The surpluses available from developed countries have fallen sharply in the past year. Reduced supplies in the face of increased demand have had a dramatic impact on the world fertilizer market which is now characterized by shortages and high prices. Prices of nitrogen and phosphate fertilizers which increased by about 50 percent in 1972 are now 300-400 percent above the admittedly low levels of 1971.

121. In the near term, the prospect is that world demand for fertilizers will continue to grow very rapidly, although in the developed countries of Europe and North America there may be some falling off in the recent growth rates. Serious shortages are thus expected to continue for at least another two years. Thereafter, new capacity now in the construction or planning stage is expected to alleviate somewhat the demand/supply imbalance, and there may even be temporary surplus capacity in phosphate fertilizers. It should be added that many constructors and engineering enterprises are currently committed for up to three years ahead, and that the severe bottlenecks already occurring in plant construction are expected to worsen.

122. This assessment of probable short-term developments is, however, subject to a number of qualifications, and there are factors which could affect the outlook either for better or for worse. For instance, if one or two very successful harvests lead to a rapid rebuilding of world food stocks, there may be a significant reduction in demand for fertilizers on the part of developed countries. Furthermore, the latest price increases are only now working their way through to the consumer level, and their impact on demand is still to be revealed. On the other hand, any serious delays in the completion of additional capacity now being built or planned could lead to a further worsening of the existing deficit situation.

123. The present difficulties have been several years in the making. Low prices (due to overcapacity) limited capacity expansion during the last half of the 1960's. In fact, many older plants were closed during that period due to high costs relative to the prices at which finished products were being sold.

124. The depressed conditions in the fertilizer market persisted into the new decade and it was not until 1971 that the market showed signs of firming up. Soon thereafter, however, the demand for fertilizers gathered strength and prices rose rapidly.

125. Several factors contributed to the upsurge in the fertilizer market and prices after 1971. First, there was a striking improvement in the fertilizer absorptive capacity of the developing countries by the turn of the decade with the impact of the Green Revolution, and the development in several countries of the institutional framework for more rapid fertilizer consumption, including more rational agricultural pricing policies and more effective extension and credit systems for fertilizers. Second, the sharp rise in foodgrain prices since 1971 also created substantial additional demand for fertilizers. Third, the cost and availability of fertilizer raw materials became a serious constraint upon the introduction of new capacities and upon short-term output from existing capacities. Nitrogen feedstocks were obviously affected by the energy situation, but the cost of phosphate feedstocks also rose as shortages developed, reflecting mainly the slow-down in expansion of rock mining capacities, the gradual depletion of the best quality rock, and rising labour costs. Finally, transportation costs showed a spectacular increase - doubling in 1972, and again in 1973, partly because of the unexpected increase in demand for shipping for international grain transportation during 1972/73.

126. Depending as they do on imports for a substantial portion of their supplies, developing countries have been hit particularly hard by the shortages and high prices currently being experienced in the world fertilizer market. The situation has been exacerbated by the tendency of producers and governments in the exporting countries to satisfy local demand first before exporting. Most developing countries also have difficulties in financing fertilizer imports. The high prices of fertilizers coupled with high prices of food and petroleum have put an almost impossible burden on the balance of payments of those developing countries that have not simultaneously benefited from increased prices of their commodity exports. It is estimated that the developing countries would need to have an additional foreign exchange outlay of $1.2 billion in 1974 in order to import the same quantity of fertilizers as in 1973.

127. As a result of these factors, FAO estimates that developing countries have imported less fertilizer during the fertilizer year 1973/74 than they did during 1972/73. In most cases, this difference has not been made up by additional domestic production. In fact, surveys have shown that, despite high prices and shortages, the rate at which fertilizer productive capacity has been utilized in some of the developing countries has been about 60-65 percent. The immediate problems facing developing countries, therefore, are to increase both imports and output from domestic capacity. Filling current fertilizer needs is important to help meet the growing demand for food, but also to maintain the confidence of farmers in the new fertilizer-based technology and institutions that they have adopted only recently.

128. One major set of recommendations to deal with the short term problem has been formulated by FAO in response to a resolution adopted by ECOSOC on 14 May 1974.

129. The FAO Council at its Sixty-third Session (July 1974) considered these proposals and approved the immediate establishment of an International Fertilizer Supply Scheme to increase the availability of fertilizers for developing countries, including the establishment of a Fertilizer Pool and to mobilize financial and technical assistance for the purchase of fertilizers and the improvement of domestic fertilizer production for importing developing countries. The FAO Council called upon the governments and industries of fertilizer exporting countries to participate fully in the Scheme and to allocate substantially increased fertilizer supplies, as compared with 1973/74, at reasonable prices to meet the needs of developing countries. The Pool is not intended to meet the overall fertilizer problem of developing nations, but, in the present emergency situation, to fill gaps when an otherwise insoluble problem emerges. Fertilizers would be supplied on a grant or subsidy basis, and cash contributions would be used to supply fertilizers to countries with balance of payments difficulties, to meet shipping costs and to improve the efficiency and output of fertilizer plants in developing countries. Several countries have already indicated their readiness to make contributions to the Pool. The Council has designated the FAO Commission on Fertilizers as the body responsible for overall surveillance of the Scheme and has suggested that FAO maintain close contact with other appropriate UN organizations and governmental and non-governmental organizations. The Council has also requested FAO to report progress on its operations in time for consideration by the World Food Conference.

130. UNIDO has initiated a second set of proposals to increase the utilization of existing fertilizer production capacity in the developing countries. The general reasons for under-utilized capacity are well known - shortage of raw material, power shortages, equipment failure and obsolescence and poor management. The specific causes of under-utilised capacity, and the measures needed to increase production of individual plants have to be clearly identified. UNIDO has proposed that surveys of fertilizer plants in certain key countries be organised to determine action needed to increase capacity utilization, and formulate programmes to overcome the bottlenecks. It is clear that the implementation of these programmes will require considerable foreign exchange financing. The Fertilizer Pool, created by the FAO Council, can also help mobilizing the resources required for this purpose.

The Medium and Longer-term Strategy

131. While the immediate need in the fertilizer field is for quick emergency action which can help alleviate the pressures on developing countries, the longer-term requirement is to initiate policies and measures which promise adequate and assured supplies of fertilizers to them at a reasonable cost. This would involve new investment in fertilizer capacity and trading arrangements in the fertilizer field which offer the

developing countries better prospects of exploiting their agricultural potential and achieving their development goals.

132. As already mentioned, the longer-term demand/supply perspective indicates that the developed countries may not be in a position to meet the entire requirements of fertilizers in developing countries. In fact, on the basis of existing and firmly committed new capacity, the developed countries as a whole would not have adequate sunpluses of fertilizers for net export to the developing world. There is consequently considerable justification for locating new capacity in the developing countries: a number of them are well endowed with the necessary raw materials, there are significant economies in locating fertilizer production near markets and there is the prospect of continuing rapid growth in fertilizer consumption in the developing world - at almost twice the rate anticipated for the developed countries.

133. A fertilizer production strategy to supply developing countries' future needs must therefore involve action in two principal directions. First, a major effort will have to be undertaken to build new fertilizer capacity in countries that have abundant raw materials. The critical requirements for building new fertilizer capacity in these countries will be (i) some assurance of market outlets for the new production, and (ii) the involvement of experienced fertilizer producers who can furnish technical know-how and management for the new plants.

134. Second, an equally vigorous effort will have to be made to develop new fertilizer capacity in the consuming countries. The typical case would involve the production of phosphate end-products and complex fertilizers based on imported phosphoric acid or ammonia. Analysis has shown that this activity can be undertaken at an acceptable cost in the consuming countries, given sufficiently large domestic markets to support plants of economic size.

135. In addition to such import based facilities, there is also justification for supporting new investment in countries (i) with sufficient gas or phosphate rock to support large domestic production, but not enough to become major exporters and (ii) where particular circumstances such as the availability of cheap coal or inland transportation costs, make localized fertilizer production viable.

136. According to a recent World Bank study, if the total additional fertilizer consumption requirements were filled by new production in developing countries, a minimum additional investment of U.S$ 5 billion (valued at 1973 prices) would be required for the new capacity to produce an additional 12.2 million metric tons of fertilizer intermediates and 11.1 million metric tons of end-products. Considering the inflation in capital goods since 1973, the amount required might now be over U.S.$6.5 billion, excluding ancillary investment in transport and other distribution facilities. Of this total, 70 percent would be to produce nitrogen fertilisers and 75 percent would be required to fill the fertilizer gap only in Asia.

137. Considering the instability which has characterized the fertilizer market in recent years, many developing countries may want to rely to the maximum extent on local production so as to have the assurance of stable and secure supplies. However, countries with small domestic markets and without adequate raw materials for fertilizer production would find the cost of producing both fertilizer intermediates and final products prohibitive, and will need to satisfy a part of their requirements for intermediate and/or end-products from imports.

138. Fortunately, the wide range of fertilizer products plus possibilities of separating the production of fertilizer intermediates and end-products makes it economically feasible, in many cases, for consuming countries to share in the process of fertilizer production, even if they do not possess the necessary raw materials or other comparative advantages in fertilizer production. In short, the fertilizer sector offers very considerable scope for collaboration between producing and consuming developing countries, and it should be a primary objective of any new fertilizer production strategy to exploit this potential.

139. New investments on these lines will open up possibilities of substantial trade between developing countries in fertilizers and fertilizer intermediates (i.e. ammonia and phosphoric acid). The new centres of fertilizer production at raw material sites will export fertilizers and fertilizer intermediates to the consuming developing countries, the latter to be processed further into finished fertilizers. In addition, there will be possibilities of trade between nitrogen and phosphate raw material sites for the production of complex fertilizers.

Cooperative Ventures

140. The viability of such an arrangement will call for a concerted effort and cooperation by all concerned. Capital, technical and management skills, and assured markets must be brought together simultaneously to establish export oriented plants in the countries with raw materials. Some of these countries, particularly those which are also major producers of oil, have the capital, but not the technical and management skills to produce fertilizer. Moreover, new investment in countries with abundant raw materials will be viable only if markets are assured. The developing countries that can provide the market will be willing to do so only if they can participate in the benefits, and be assured of fertilizer supply at a reasonable cost.

141. The three parties - producing countries with raw materials, consuming countries with markets and experienced fertilizers producers with technical and management skills - can be brought together in a variety of cooperative ventures. These may include joint ventures among the parties, long-term contracts, parallel investments and other forms of economic and financial collaboration. The best form of cooperation will have to be identified in each case.

142. The international community must help facilitate the formation of these cooperative ventures. Institutions such as IBRD, IFC and regional development banks can help finance cooperative ventures in those cases where the parties themselves cannot raise adequate finance, or where it is desirable to help the consuming countries participate in the ownership of the project. More importantly, the international organizations can help work out the economic and technical arrangements for these ventures to ensure that all parties have the opportunity to participate equitably in the benefits.

143. Some of the oil-producing countries can also facilitate the formation of cooperative ventures. In these countries the resources of natural gas, now being flared, are so large that the gas could be made available at a price sufficiently low to attract investment. It is estimated that in 1972 more than 62 percent of all gas produced by OPEC members, i.e. over 130 billion cubic metres, was flared. This volume of flared gas could enable them to produce 5 times as much nitrogen fertilizers as the total projected consumption for the developing countries in 1980/81. The mobilization of this resource, apart from benefiting the economies of oil-producing countries, can make an enormous contribution to the objective of producing fertilizers cheaply for the developing world, and at the same time constitute a strong incentive to the consuming countries to purchase intermediate or end-products from such producers.

144. Foreign assistance and long-term credit financing of fertilizer sales to developing countries has been an important element in fertilizer trade between the developed and developing countries in the past. Indeed, toward the late sixties nearly one half of fertilizer purchases by developing countries (excluding centrally planned countries of Asia) were financed on aid terms. The creation of substantial new fertilizer capacity at raw material sites in the developing countries must also be accompanied by appropriate sales financing arrangements that are acceptable to both producing and consuming countries. The oil-producing countries which are potential fertilizer producers have a particularly important contribution to make in this area. The international institutions can assist in devising mutually satisfactory arrangements and these might well prove to be a key element in linking potential producers with markets.

145. Beyond sales financing, it may be necessary to devise a more explicit mechanism to provide fertilizer aid to the poorest countries which neither possess the raw materials and other resources required to develop an indigenous fertilizer industry, nor the financial resources to support adequate imports of fertilizers on commercial terms. In such countries, it will be necessary to consider measures analogous to those proposed for the short-term emergency action programme. The Fertilizer Pool, created in pursuance of the recent ECOSOC resolution, and of the FAO Council could perhaps be utilized to allocate, on behalf of the exporting countries, fertilizer supplies on credits or on concessional terms to needy countries on the basis of established criteria. Such a pool could also help stabilize sales during periods of growing imbalances between the demand and supply of fertilizers.

146. The Economic Commission for Asia and the Far East (ECAFE) has formulated a proposal, in pursuance of Resolution 142(XXX) adopted by the Commission at its Thirteenth Session (Colombo, Sri Lanka, March-April 1974) for the immediate establishment of a World Fertilizer Fund. The main features of this proposal are summarized in Annex A to Chapter 20. Any action by which the international community might set up a separate Fertilizer Fund or an Agricultural Development Fund with special provisions for fertilizers, as discussed in Chapter 20 of this document, would greatly facilitate the implementation of these proposals for larger investments in the fertilizer industry and for evolving cooperative ventures.

147. Even if the investment and cooperative ventures on these lines are undertaken to help meet the developing countries' future fertilizer needs, it should not be expected that fertilizer prices will ever again be as low as they were in 1970/71. In an era of substantially higher energy cost, prices of fertilizers - particularly nitrogen fertilizers - will tend to rise relative to other prices, and it will be necessary to maintain appropriate fertilizer/crop price relationships- a key element in fertilizer usage. It will also be necessary to identify methods of conserving fertilizers, and in the long term it will be desirable to develop alternative methods of supplying plant nutrients to agriculture.

Alternative to Chemical Fertilizers

148. An assessment of the requirements of developing countries for chemical (inorganic) fertilizers should not ignore the present and future potentials of organic fertilizers. Organic fertilizers encompass various types of plant, human and animal wastes which provide nitrogen, phosphate and potash nutrients as well as other benefits to agriculture. The total potential availability of this fertilizer resource in the developing countries is very large - it is estimated very roughly that the total of waste products in developing countries in 1970/71, which could be used for organic manuring, contained 7-8 times more nutrient (in terms of N, P and K) than the total amount of inorganic fertilizers consumed by them in that year.

149. An important source of organic fertilizers is methane gas production which is a natural by-product of the decomposition of animal and other wastes. The process of capturing methane gas and producing fertilizers has now become technically feasible for certain urban composts and sludges, and is also being used on a limited basis in some rural areas in the developing countries. While there are diverse practical and organizational problems in the mobilization and use of organic fertilizers, the rapid rise in the cost of chemical nutrients plus the desirability of combining the use of organic and inorganic fertilizers for environmental and soil conservation reasons, warrants more effective national programmes to mobilize this resource.

150. An effective fertilizer investment and production strategy alone will not assure the availability of adequate food and agricultural supplies unless there are parallel programmes to improve technology and undertake research in various aspects essential to soil fertility and plant growth. As FAO has indicated in its studies, particular attention needs to be given to three priority areas: (a) Investigation and development of means to control and increase the biological fixation of nitrogen and microbial solubilization of soil nutrients Further research in this area shows the best long-term promise of providing an inexpensive supplementary source of plant nutrient; (b) conservation and reutilization of plant nutrients in farm and other wastes, and in animal and human manure; and (c) improvement and more efficient use of chemical fertilizers, especially for the tropics and sub-tropics, and of the technology to produce them, including the development of better and suitable cropping systems and patterns to maximize the efficient utilization of natural resources and production inputs.

151. A programme of technology development in these areas would obviously include both a national component - dealing with field work, associated research and testing - and an international component focussed on more basic research, and on supplying the missing skills and information required at the national level. The recent initiative of the U.S. Government in seeking the establishment of an International Fertilizer Institute could greatly assist some of these programmes.

Conclusions and Recommendations

152. The developing world faces a crisis in the fertilizer field over the next two to three years since high fertilizer prices and shortages are expected to continue in the near term. While the situation may be somewhat alleviated by the late seventies - particularly in phosphate fertilizers - as new capacity, now under construction, comes on stream, the trend of consumption in developing countries is strongly upward and unless further capacity is planned from now on a large gap between fertilizer consumption and availability will emerge by the end of this decade in both nitrogen and phosphate fertilizers. As already mentioned earlier, in order to fill the likely gap in production capacity up to 1980/81, it seems necessary to invest about U.S.$6,500 million by 1977/78, i.e. at the rate of about U.S.$2,000 million per year from 1975/76 onward.

153. In view of the close interdependence between the supply of fertilizer and the level of food and agricultural production, the emerging situation could have the most serious consequences for the economic well-being of developing countries unless appropriate corrective measures are soon adopted at both national and international levels. The situation calls for bold new initiatives, designed to assure an adequate supply of fertilizers to developing countries at a reasonable cost and there is a clear need for a world fertilizer policy, some elements for which have already been discussed above.

154. The World Food Conference may wish to consider the following proposals to ensure the adequate availability of fertilizers to developing countries in the short and longer term at reasonable prices:

A. For the short term

(i) Emphasize the paramount urgency of easing the shortage of fertilizers in developing countries and recommend appropriate measures taking into account the action already taken by the FAO Council in pursuance of the ECOSOC Resolution on the emergency plan of operation and the establishment of a "Fertilizer Pool";

(ii) Recommend that international institutions and bilateral aid programmes give high priority to the provision of financial assistance to developing countries for imports of fertilizer feedstocks and fertilizers;

(iii) Recommend that FAO, UNIDO and IBRD jointly organize a programme to assist selected countries in improving their fertilizer plant operations, and rates of capacity utilization, coordinating where necessary with the bilateral aid agencies providing assistance for this purpose;

B. For the longer term

(iv) As a part of the efforts to evolve a world fertilizer policy, call on international institutions and bilateral aid agencies to extend full support for programmes to build new fertilizer production capacity in countries that possess natural gas or phosphate rock to support an export-oriented fertilizer industry and in other developing countries which do not have the basic raw materials but where specific local factors justify such investment;

(v) Call on developing countries to actively explore possibilities of devising cooperative ventures in the fertilizer field with a view to promoting a more economic and stable system of fertilizer production and supply. To this end, the Conference should:

a) Urge oil-producing countries to allocate a part of their flared gas resources for fertilizer production on reasonable terms and develop appropriate sales financing arrangements which would induce other developing countries to secure a part of their fertilizer imports from those countries;

b) Urge other developing countries to open at least a part of their market to imports of fertilizer intermediates and end-products from developing exporting countries and consider entering into long-term arrangements for fertilizer imports as a part of an overall strategy to ensure stable supply of low-cost fertilizers to the farmer;

c) Urge established fertilizer producers in developed countries to participate actively in the programme to create new fertilizer capacity in developing countries by providing technical know-how and management skills;

d) Urge international institutions to lend their full support to these policies and arrangements.

(vi) Urge all countries to introduce policies and measures which promote the most efficient and effective use of available fertilisers for increasing food production in developing countries and recommend a more comprehensive and effective international effort for promoting methods of soil fertility and plant growth through the development of improved chemical fertilizers, greater utilization of organic fertilizers and biological fixation of nitrogen.

B. Pesticides

155. Pesticides constitute an important input in the total effort to increase food production through plant protection and food conservation. In spite of current attempts to prevent crop losses, an estimated average of 35 percent of potential yields in developing countries is lost due to defective or inadequate control measures. Any worldwide coordinated effort to increase food supplies should, therefore, aim at drastically reducing the losses caused by pests, diseases and weeds.

156. One element of major importance is the availability of pesticides. In 1970/71, only 160 000 tons of pesticides were used in the developing world (excluding China). Recent surveys by UNIDO/FAO in 14 developing countries of the ECAFE region indicate that pesticide requirements would increase by about three and a half times in the region within seven to eight years. Also, in order to accelerate food production to the desired levels, it is estimated that pesticides requirements of the developing countries as a group would have to increase to about 800 000 tons by 1985.

157. One of the crucial areas of increased pesticide use in the developing world would be the support to be provided for the widespread use of high-yielding varieties of rice especially in Asia where this crop is so central in nutrition. It is clear that the higher the yields attained by using high-yielding crop varieties, and by higher dosage of fertilizers and irrigation, the more important it is to protect the crops from pests and diseases both during cultivation and storage.

158. While the important role of pesticides in the strategy for increasing food production is widely recognized, the current supply/demand situation of pesticides is very serious. During 1973/74, the current demand has been met largely by drawing on this year's production, which normally would have been available for use in the 1974/75 season. The supplies for the 1974/75 season have apparently been used up in 1973/74, so that there would be a global deficit of 20-30 percent for pesticide requirements in 1974/75. A shortfall of this order could almost eliminate the pesticide supply to the developing countries if the developed countries which produce almost all of the basic feed-stocks for pesticides, give first priority to meeting their own requirements.

159. The medium-term outlook for pesticides supplies is also very unsatisfactory. Due to environmental concern about pesticides, legislation constraints in developed countries have greatly increased the time as well as the funds needed to develop new production. At the same time the prospect of continuing shortage of feedstocks would not allow optimum utilization of existing capacity. Thus, most of the pesticide manufacturers in the United States are reported to have had their 1975 order for feedstocks reduced up to 50 percent so that their plants would be operating far below capacity. Moreover, although several new factories are now nearing completion, the prospect of their being able to operate is clouded due to feedstocks shortage. There are some prospects for developing countries to raise production of a limited number of compounds which do not require the basic feedstocks produced in developed countries. Nevertheless, the outlook is for the supply situation to remain extremely tight for some time to come.

160. For the longer term, the production capacity for basic feedstocks could be increased in at least some developing countries. Further, with a view to reducing the dependence on chemical pesticides, there is need to step up research on biological measures to control pests or to develop crop varieties which have better pest resistance.

Main Elements of an Intensified Programme

161. The main objectives of the action programme on pesticides will be to assist developing countries: (i) in obtaining the pesticides required for meeting urgent needs and for the implementation of their plant protection programmes; (ii) in proceeding to develop their own pesticide industries, where feasible; (iii) in strengthening their plant protection capabilities through training, consultant missions and supporting research activities; and (iv) to launch breeding programmes for horizontal resistance

to diseases and to promote the development of integrated control programmes of insect pests.

162. The programme would mainly concern the developing countries of the tropical and subtropical areas, and in particular those experiencing difficulties in developing and implementing their plant protection plans. It would utilize, to the maximum extent feasible, the available national and international resources in a coordinated manner, including those of industry. The experience gained in the successful organization and operation of locust control measures, which have kept a forty-two country region free of locust plagues for a decade, would be used as a pattern for control of other pests.

Action in the Short Term

163. In order to meet the short-term problem of pesticides supply shortages faced by the developing countries, action along the following lines seems necessary:

(i) A programme may be developed, in cooperation with the pesticides industry, to establish regional reserve stocks of basic pesticide chemicals, application equipment and spare parts for emergency use in key areas around the world, supported by a sufficient cash reserve for emergency consultant services;

(ii) The feasibility of establishment of an international priority allocation system for pesticides and plant protection equipment needed for critical control programmes in developing countries should be examined at an early date. Such a system based on specific pesticides and equipment would require detailed assessment of national and regional requirements, and for its smooth operation the pesticide industry would need to give an agreed priority for allocation of specific materials for meeting the critical and urgent needs of the developing countries;

(iii) A system of providing bilateral and multilateral assistance should be developed for arranging supplies of pesticides and equipment to the developing countries on concessional terms, where necessary.

The Medium and Longer-term Action

164. The strategy for action in the medium and longer term would need to aim at improving the efficiency of pesticides use, the strengthening of the plant protection services, assisting the developing countries in promoting pesticides industries, where feasible, and developing crop varieties with better pest resistance. Action along the following lines seems desirable:

(i) In order to improve the efficiency of pesticide use in developing countries, it would be necessary to organize intensive training courses on safe and efficient use of plant protection methods, and to support or supplement research activities to develop better pest management practices, including more effective and practical biological control agents.

(ii) Many developing countries would also need to be assisted in strengthening their national plant protection services, including designing and implementing necessary advisory services, quarantine programmes, pests and disease surveillance, forecasting services, and monitoring facilities. It is necessary not only to increase the number of trained staff, but also to develop extension activities in close coordination with research.

(iii) As national plant protection services develop, regional plant protection organizations will need to acquire a greater coordinating role. Not only will their activities need to expand in preventing the introduction of pests and diseases into regions, but problems of regional importance will increasingly have to be solved through their channel. In this connection, regional projects or networks for research on given pests and diseases should be set up on a collaborative basis with existing research institutes - both national and international.

(iv) The developing countries would need to be assisted in promoting their own pesticide industries, wherever possible. As far as feasible, the development of pesticide industries in developing countries should be based on local formulation, which could be readily achieved. Local formulation not only would lead to substantial savings in foreign exchange but also could utilize local raw materials, such as mineral carriers, other diluents and solvents. That substantial progress in this field can be made in spite of numerous difficulties has already been demonstrated by some developing countries.

(v) An important factor in reducing fluctuations in food production is the development of high-yielding varieties which also contain stable resistance to primary diseases and where possible to insect pests. This can best be done through breeding for horizontal resistance. Plans have been designed by FAO to implement the necessary breeding programmes for horizontal resistance at the individual country level and on major food crops.

165. To sum up, the World Food Conference may wish to consider the following proposals to improve the pesticides supply situation for the developing countries in the short and longer term:

A. For the Short Term

(i) Recognizing the need for assuring adequate supplies for meeting urgent needs of developing countries, request the FAO, in cooperation with representatives of the pesticide industry, to examine the feasibility of developing a programme for establishing regional reserves stocks of basic pesticides, application equipment and spare parts; for introducing an international priority allocation system for pesticides needed for critical control programmes in developing countries; and for providing bilateral and multilateral assistance for arranging supplies of pesticides and equipment to the developing countries on concessional terms, where necessary.

B. For the Medium and Long Term

(ii) Recommend to the national governments to strengthen their national plant protection services including necessary advisory services, quarantine programmes, pests and disease surveillance, forecasting services and monitoring facilities and to cooperate in setting up regional projects or networks for research on given pests and diseases in collaboration with existing research institutes;

(iii) Request FAO and other interested agencies to organize intensive training courses for developing countries on safe and efficient use of plant protection methods and support research activities to develop better pest management practices;

(iv) Request UNIDO to intensify its programme to assist developing countries in promoting their own pesticides industry, wherever possible, preferably based on local formulation;

(v) Request UNEP and FAO to implement as soon as possible their joint global programme for research and training in integrated pest control with special reference to the preservation of environmental quality.

C. Quality Seeds

166. Good seed constitutes a basic input in the production of crops. It is also a relatively cheap and simple input resulting from adaptive breeding research. In areas of limited physical potential, seeds of varieties resistant to disease and climatic hazards may be the main contribution which modern technology can make to crop improvement. Quality seed of high-yielding varieties coupled with other inputs form the basis of increasing food production substantially.

167. Research work over the past decade has resulted in the development of new high-yielding cereal varieties which are both more responsive to irrigation and fertilizers and have a much higher yield ceiling when used in proper combination with these and other complementary inputs. Since current cereal yields are generally low in developing countries, the new varieties not only offer the possibility of a rapid increase in production but of maintaining the desired growth rate over an extended period. An important element of the strategy for increasing cereal production is, therefore, to exploit the potential created by this new technical breakthrough. High-yielding varieties have begun to make significant impact on production in Asia, the Near East and Latin America and have had a catalytic effect on the adoption by farmers of modern production techniques and on increasing multiple cropping.

168. Before the advent of high-yielding varieties, the contribution in benefits attributed to improved varieties in developing countries was relatively small - 5 to 10 percent. This has been radically changed by the introduction of high-yielding cereal varieties and has rendered a dynamic programme to ensure an adequate and continuing supply of quality seed not only desirable but essential to the success of the whole strategy of food production in many developing countries.

169. A survey of available data on progress in improvement of cereal varieties and the extent of adoption of high-yielding varieties shows that out of 140 developing countries only about 25 were using them on a large scale and of these only a third had established adequate seed multiplication and other essential services. In Asia, progress with wheat has been encouraging and a significant proportion of the wheat area has already been brought under high-yielding varieties; but much greater effort is needed to expand the area under high-yielding varieties of rice. Development in respect of maize, sorghum and millet has been slower due to limited availability of suitable varieties or hybrids and also due to lack of facilities in production of hybrid seed.

170. Both in the Near East and in North Africa, there appears to be good scope for raising wheat and barley yields in irrigated and higher rainfall non-irrigated areas. Special attention would however need to be paid to developing varieties tolerant of salinity and insecure water supplies.

In Africa, South of the Sahara, the total irrigated area under cereals is much less. There is also not so much pressure to introduce high-yielding varieties. In the Sahelian zone, where millet and sorghum are the staple cereals, the need would be to develop suitable seeds for available irrigated or assured rainfall areas. In Latin America significant progress has been made in developing high-yielding varieties in Mexico, Colombia, Chile, Peru and Paraguay. Maize research is well advanced in Chile, Argentina, Venezuela, Colombia and Ecuador. Irrigated rice yields are also high in Argentina, Colombia, Uruguay, Venezuela and Brazil. At present several countries of Central and South America lack adequate programmes for the production and distribution of quality seed but Latin America as a whole is ahead of other developing countries in this field.

171. A recent FAO survey of 97 countries (27 in Africa, 20 in Latin America, 20 in Europe, 14 in Asia, 12 in the Near East, 2 in Oceania and 2 in North America) indicates that about 85 percent of the countries fall in the category where the potential for the introduction of improved varieties is considerable but seed supply is inadequate and there is an urgent need for the development of a well-founded seed industry. In fact, the lack of organized seed programmes represents the weakest link in the development of quality seed in most developing countries.

172. The developing countries would require assistance in building up viable modern seed industries. Already, there is an international assistance programme in this field, but it needs to be substantially strengthened to achieve the desired objectives. FAO has an international Seed Industry Development programme for basic foodcrops to assist developing countries in speeding up the development, evaluation and release of improved varieties, seed production, quality control and distribution, with the ultimate objective of enabling the countries to establish efficient seed industries. Within the framework of this programme the present status of seed production activities in a number of countries has been evaluated and constraints in the national seed programmes have been identified. Also, a seed training programme has been prepared which provides for training at national and regional levels.

173. Several bilateral donors have indicated their willingness to give financial support to the FAO Seed Industry Development programme. However, the need to accelerate the pace of seed industry development would require a much larger financial input.

Quality Seed Development

174. The main aim of the programme would be to establish and strengthen the seed development industry on a permanent footing for continuous supply of good-quality seed to the farmers. Whilst arrangements exist in a number of developing countries for the development of quality seed, the multiplication and distribution of such seeds to farmers in sufficient

quantities is inadequate. The proposed action programme would, therefore, aim at providing a suitable framework for the production and multiplication of high-quality seed in sufficient quantities to replace the necessary proportion of farmers' seeds for the key annual crops at regular intervals. This would ensure maintenance of the quality standards and genetic purity, vigour and freedom from disease and mixtures of undesirable seeds. The main objective would be to produce adequate stocks of good quality seeds every year so that the lack of quality seed does not act as a constraint in raising food production.

175. If one half of the area under rice, 60 percent under wheat, 40 percent under maize and 20 percent under sorghum and millets in developing countries is to be covered by high-yielding varieties by 1980, it would require the production of about 230 000 tons of rice seeds, about 700 000 tons of wheat seeds, about 200 000 tons of maize seeds and about 45 000 tons of sorghum and millet seeds by 1979. Facilities for production, processing, quality control, storage and distribution to support the proposed seed production programme will have to be created in a phased manner.

176. The responsibility for production, processing, procurement, quality control, storage and distribution of seeds would of course rest with the countries themselves. Besides adequate resources from national and international sources, the programme will also require a network of institutions to perform specific jobs in different areas. International assistance will be required specifically for:

(i) securing equipment for processing, storage and seed testing, and

(ii) training of personnel required for production, processing and quality control.

Seed Reserve Stocks

177. In many countries there is loss in production due to natural calamities. These calamities cause losses not only of the crop but also the seed required for planting the next crop. In order to safeguard against losses from such calamities, it is proposed to build and maintain seed reserve stocks.

178. The volume of stocks will depend on the extent of damage that usually occurs and also on the facilities available for production. Seed reserve stocks would aim at securing agricultural production in such areas which are prone to suffer due to natural calamities.

179. Seed stocks should be maintained in areas where it is economical to store and where facilities exist for production, processing, storage and distribution. These stocks may be maintained on a regional or a sub-regional basis, where appropriate. The feasibility of integrating

the organization and management of the seed reserve stocks with the national food reserve in the developing countries as a part of the food security programme, as suggested in Chapter 14, would need to be investigated with a view to minimizing costs and avoiding duplication of machinery.

180. To sum up, in the light of the important role which good seeds can play in the raising of yields and enabling other modern inputs to unfold their potential, the World Food Conference may wish to:

(i) Endorse the targets for seed industry development outlined in paragraphs 174-176 and recommend to governments to make all efforts to reach them by providing the necessary financial and manpower resources for the development of the seed industry; and invite all bilateral and multilateral aid-giving agencies to extend their support and help to national governments in achieving these targets.

(ii) Recommend that FAO's international Seed Industry Development programme be expanded so that it could carry out its support function for the national development programmes at the required level.

(iii) Suggest that FAO investigate the feasibility of establishing Seed Reserve Stocks in different areas of the world and of integrating those with the proposed assistance programme of national food reserves in developing countries.

D. Credit

181. In order to adopt the new technological package, and to buy the necessary high-yielding varieties of seeds, fertilizers and pesticides in required quantities, and the irrigation equipment, farmers need much more money than they have. In South Asia, the average small farmer spends $6 per hectare per year when he should be spending between $20 and $80 according to crop. To purchase the inputs the farmer needs credit. Furthermore, he needs short-term credit if he is to avoid selling his crop immediately after the harvest when prices are at their seasonal low, and he needs long-term credit for making permanent improvements to his farm, such as terracing or sinking tube wells or acquiring machinery.

182. Despite the predominant role of the agricultural sector in most developing countries, only a small proportion of farmers receive institutional credit: about 5 percent in Africa, up to roughly 15 percent in Asia and Latin America. Only a fraction of the institutional credit going to agriculture is available to the small farmer of whom, according to one estimate, there are over 100 million in the developing world.

While most large farmers can obtain credit and often can choose between alternative sources of supply, the small farmer either obtains none at all or else depends on the local money-lenders because commercial credit institutions find the administration and supervising costs of small loans unattractively high. Too often the end result of the smallholder's dealings with the traditional credit system is chronic indebtedness from which he finds it difficult to extricate himself.

183. It is therefore important in many countries to organize new channels for supplying farm credit, or to extend existing ones. Depending on local circumstances the choice may fall on direct lending by government agencies or by government-supported agricultural banks, on commodity marketing boards, on farmers' cooperatives and other associations or on commercial banking institutions. Enterprises, whether cooperative or private, which provide contract services to farmers may also constitute one of the sources of credit.

184. Second, it is important for governments to increase substantially the resources available for institutional credit and to encourage local savings. To promote the channelling of internal private capital into agriculture a high rate of interest should be assured to potential investors. Low interest rate charged to farmers on loans received from banks is considered a measure to counteract the harmful effect of rural usury. To compromise between these two different objectives, governments often subsidize the banks to cover the difference between the high return to be paid to investors and low interest rates charged to farmers. Alternatively, realistic rates can be charged on the assumption that even small farmers can afford to pay 10 to 12 percent for short-term loans, e.g. for fertilizer purchases, when the rate of return may be 20 to 25 percent. Moreover, on long-term loans under conditions of inflation, nominally high rates of interest may not be high at all.

185. In the typical developing country the national policy for farm credit needs to be conceived in two stages. In the first stage credit proves a means of stimulating a changeover to more modern and more profitable types of farming. This assumes that there are economic opportunities for exploiting new technology or other improvements. In the second stage, when agricultural progress has visibly taken hold and farmers' living standards have begun to improve, the role of the farm credit institution should shift to mobilizing agricultural savings for recycling, i.e. relending. In other words, a part of the value of the marginal increase in production should reach the credit institutions in the form of deposits, and similarly part of the profits derived from local marketing and food-processing activities in which the institutions often have an interest.

186. It is sometimes argued that in an unmodernized agriculture the farmer, especially the small farmer, is an unacceptably high risk, and this may often be true if the lender has no concern for the activities of the borrower. By contrast, even among very small farmers, the supplying of credit can be commercially sound provided that it forms part of a package of innovations which the farmer agrees to accept as a whole, and that his adherence to the new practices is monitored by the cooperatives' officers or the extension agents who should be collaborating closely with the credit service. Some outstanding successes have been achieved when the farmer has only one single office to go to for his seeds and fertilizers, for his credit, for his technical advice and for the disposal of his produce.

187. The major challenge facing most countries is to develop effective credit institutions for dealing with large numbers of small farmers who must be drawn in as active participants in the production effort. Small farmers require much more attention than large farmers in terms of supervision and extension services, delivery systems for production inputs and assured market outlets. Moreover, they are less capable of withstanding risk or of providing conventional collateral for loans. With respect to crop-financing credit, many small farmers lack facilities for storing their crops. With respect to longer-term loans many do not have clear titles to their land. In this context price stabilization schemes and crop and livestock insurance can both strengthen the small farmers' position. Moreover, the small farmers becomes a better credit risk when new attitudes begin to permeate rural society and when the nature of market-oriented production and its financing begins to be understood.

188. Success in establishing improvements in agricultural credit services, especially for small farmers, will facilitate external financial support for the developing countries from credit institutions. The World Bank has already declared its intention of expanding its agricultural lending programme in the 1974-78 quinquennium and expects that about 70 percent of the Bank's agricultural loans will contain a component for smallholders.

189. Reaffirming the vital role of farm credit in accelerating the application of modern technology to agriculture, the World Food Conference may wish to:

(i) Urge developing countries' governments (a) to re-examine and where necessary re-organize the institutional arrangements for expanding their farm credit programmes especially for small farmers; (b) to take steps as necessary to increase farmers' credit-worthiness by improving crop storage and marketing facilities, by clarifying land titles and by other appropriate measures; (c) to utilize the credit agencies more vigorously for mobilizing and recycling the savings of the agricultural sector.

(ii) Recommend that external financial support for credit programmes be greatly enlarged from present levels approximating $500 million to an average of $1,000 million during the next five years, including annual increments of about $200 million to revolving funds established to provide short-term credit to farmers for the purchase of fertilizers and other inputs. At least half of such credit should be channelled to small farmers.

Chapter 3

Development of Land and Water Resources

190. The proposals made in the preceding chapter for augmenting the use of agricultural inputs had, of course, the increase in the productivity of agricultural land as their primary objective, what is sometimes referred to as the "vertical expansion" of production. In the present chapter, when the discussion turns to agriculture's physical resources i.e. land and water, part of the action relates also to vertical expansion as when, for instance the functioning of existing irrigation systems is improved or when irrigation is newly brought to hitherto rain-fed arable land. All this serves to increase per hectare yields. But another part relates to bringing virgin land or semi-virgin land into regular agricultural use, with or without irrigation, a process often described as "horizontal expansion". There is no clear line of demarcation between the two activities. For example, lands which were cultivated from time to time by "slash and burn" techniques can be converted for permanent settlement; lands which were grazed occasionally by nomads can become settled areas if irrigation water is made available. But broadly the distinction is useful, namely that food production can be expanded both by vertical and by horizontal programmes.

191. There can be no doubt that both approaches must be adopted simultaneously. Some countries have in any case very little virgin land available for cultivation and must rely heavily, indeed almost exclusively on yield improvements. Other countries have unused land available and therefore have an option as to how much to pursue the bringing into cultivation of these lands and how much to concentrate on improving yields in the existing arable area. Cost-benefit studies may assist in decision making. But in the longer run, and certainly after 1985, it will not be possible to feed the population of the developing world unless, in addition to every possible yield improvement, large new areas of land and substantial new flows of water are mobilized for agricultural production.

Renovation and Improvement of Existing Irrigation Facilities

192. Highest priority attaches in the short run to this programme which will lead to higher crop yields per unit area of irrigated land. The activities will include improvement and rehabilitation of existing irrigation schemes of all sizes which, through neglect, unawareness or both, are not now being fully utilized. The objectives are to ensure that the large projects, frequently long-established, are operating at high efficiency and to provide the individual farmer or groups of farmers with knowledge and means for more effective water use. A reasonable target for achievement between now and 1985 might be to renovate half of the existing facilities or say 46 million hectares.

193. The returns obtainable by a thorough overhaul of the world's facilities for irrigated agriculture would be enormous. A large number of irrigation schemes are operating at less than 50 percent efficiency and the doubling of staple food crop yields, such as cereals, with improved management of the necessary inputs is perfectly feasible in many areas. When it is remembered that the developing world has, in all, about 93 million hectares of land equipped and capable of being irrigated, it is clear that there is immense scope for increasing production. If it is assumed that 70 million hectares are used for cereal production, then an average improvement in crop yields of one ton per hectare, achieved in, say, five years would mean an increased production of 70 million tons or nearly 20 percent of the total estimated cereal output of all the developing market economy countries in 1969-71. This would be the equivalent of at least 18 million hectares of new, fully equipped, irrigation projects which would otherwise require a minimum capital outlay of the order of 30 billion dollars.

194. For many irrigation schemes such improvement consists of renewing the capacities which have deteriorated or have been reduced due to lack of proper management. While such improvement works will require additions to the original capital investment, it is very often the case that returns from investment in the improvement of existing schemes are higher than could be expected from the same investment in new works.

195. Increasedproduction in existing irrigated farms will be obtained by: improving water availability and storage, improvements in distribution networks, provision of on-farm facilities, operation and maintenance of facilities, irrigation and drainage practices, field reshaping and grading, education, training and extension.

196. The implementation of these programmes presupposes willingness on the part of developing countries' governments to accord such activities a higher priority than in the past. The principal obstacles to be overcome are shortage of trained manpower and lack of funds. In each of the larger countries steps should be immediately taken to expand training facilities in the disciplines required for land and water development. As to funds, the estimated total cost for improving approximately 46 million hectares would be about U.S.$ 21 billion, with an estimated U.S.$ 6.5 billion in foreign exchange requirements.

New Irrigation Schemes

197. In respect to priority and phasing, new irrigation development comes immediately after the renovation and improvement of existing schemes, though in countries which do not yet have much irrigation or in which the existing schemes operate efficiently new projects may be given high priority. In some countries the groundwater supplies have been little used as yet and where the geological conditions are favourable a relatively modest investment in tube wells could mobilize a lot of water. In some a part of the run-off water can be retained by constructing inexpensive earth dams. In others the small and medium-sized rivers can be utilized without

major dam construction. Where the latter appear necessary their costs need careful investigation because outlays are likely to be high (the easier sites having been already taken) and the benefits for agriculture and for power generation require to be objectively assessed.

198. In some regions, such as North Africa and the Near East, where most of the river waters are already in use, the chief emphasis will be on developing the groundwater supplies. In large parts of Sub-Sahara Africa and Latin America the rivers have hitherto been only partially harnessed for irrigation and much more could be accomplished without very heavy investment. This is also the case in some countries of the Far East but in others the progress in irrigation depends on the undertaking of major works to regulate and control the flow of very large rivers. In all regions the potentially high production levels offered by modern crop technology demand that new irrigation systems be built to much higher performance standards than in the past.

199. The new irrigation programmes envisaged to be feasible between now and 1985 might be expected to encompass some 23 million hectares of which some two thirds would be in the Far East, but in due course a further expansion of African and Latin American projects will be required. In monetary terms the total outlay for the 11 years, 1974-85, at 1974 prices may approach U.S.$ 38 billion. Many of the individual projects to be contained in such a programme would be of a large-scale, slow maturing type and would need long-term financial assistance on attractive terms. In the past, financial aid for irrigation development has already represented a fair share of total agricultural aid but the needs of the future are even higher.

200. Several developing countries have already initiated action by launching water resource surveys but such surveys are time-consuming and require professional competence of which many developing countries are short. It is accordingly proposed that a World Survey of Water Resources and Irrigation Potential be undertaken as a cooperative project by the relevant international agencies. The cost of the proposed survey would be about U.S.$ 7 million. The work will include:

- Identification of objectives and establishment of guidelines for the survey.
- In collaboration with technical services of the countries, to collect data on water resources at national level and later to aggregate the same at regional level.
- In close collaboration with the national soil resource services, to correlate available water resources to land classification and land capability maps and thus determine the potential areas of irrigation development.
- In close liaison with national and regional research institutes, to study the crop/water requirements which can be taken as the basis for the purpose of making an assessment of potential areas.

- In close collaboration with the irrigation departments of the countries, to collect data on the cost of irrigation development, capital outlay as well as the annual operation and maintenance costs for completed projects and using them to develop the construction cost indices which could be applied for different types of irrigation schemes.

201. While planning and construction skills can be imported relatively easily in the form of consulting services, in the longer run, for countries with large irrigation development needs and potentials, it is a must to increase their own skills in these tasks. Training and research would have to be central issues when building up a new implementation capacity within developing countries. An International Irrigation Development and Water Use Institute, concerned both with the development and with the better use of irrigation potential and with training could contribute significantly to the achievement of such a goal.

Development of New Arable Land

202. After examining country by country the present land use potentialities, it would seem reasonable to establish as a target for the developing countries as a whole an increase in arable area from 737 million hectares in 1970 to 890 million hectares in 1985. In view of the time horizons involved in developing new lands, in the short run the emphasis deserves to be placed on actions to speed up the already active land development and settlement trends in those areas where this has been going on spontaneously, such as in large parts of Africa and in many areas of South America, and to expedite the implementation of the land settlement projects under way at the present.

203. Assuming continuation of the past rate of settlement at about 4-5 million hectares per year which was made up of about 75 percent spontaneous and 25 percent organized settlement, and assuming that for spontaneous settlement the provision of simple services would cost about U.S.$ 50/hectare and for organized settlement about U.S.$ 400/hectare or more, the cost of the existing action programmes must amount to about 1.2 billion dollars per year. Financial help together with some strengthening of present technical aid and an evaluation of the experiences of the past would be the activities related to land development in this phase.

204. In the medium and long term the scene needs to change to a higher rate of opening up of new areas. To be able to do so would require in the first place that a careful assessment be made of the potential areas for development, their suitability for various activities taking into consideration degradation hazards and productive capability under various levels of technology.

205. There are four major areas where large-scale land development potentials hold out opportunities for large gains in arable land.

These are the Amazonas basin, the Mekong basin, the Southern Sudan and the tse-tse fly infected area of Middle Africa. While the first three areas are very different with respect to the specific development measures that need to be applied for their being brought under cultivation, the need for major infrastructure building, for massive investments and for wholesale resettlement of population is part of all three. The fourth area in middle Africa is discussed in Chapter 4 under specific proposals for meat development although the area once cleared will be used for both crop and livestock production.

206. Such an assessment at the global scale could be achieved by establishing an information network linking nations to an International Land Resource Centre and by combining country evaluations that have been prepared, wherever possible, by national multidisciplinary groups using internationally agreed and standardized methods.

207. Training of staff in the necessary disciplines would be undertaken at sub-regional seminars. The cost of establishing and running the Land Resources Centre is estimated at U.S.$ 5 million over a period of three to four years.

208. With the help of the better knowledge emerging from the careful assessment of soil resources, it would be possible to step up, say from 1980, the rate of development and the methods of development. At this stage, an increasing share of the new land opened up should be under organized settlement so that conscious effort could be made right from the beginning of project preparation for bringing this land under a modern productive agriculture.

209. Assuming that during the first phase the rate of land development would rise to 6-7 million hectares per annum and 75 percent of it would be under organized settlement, the investment costs would mount rapidly reaching U.S.$ 2.0 to U.S.$ 2.3 billion per annum. The total cost up to 1985 would be around U.S.$ 30 billion. In the second part of the eighties, making use of the experience already gained, land development could and should accelerate to over 10 million hectares per annum.

Objectives and Costs

210. It has to be recognized that the programmes outlined above in regard to better use of water and land resources pose a wide variety of complicated problems. These relate not solely to the investment requirements which, as will be seen, are of tremendous magnitude but just as importantly to the recruitment of personnel competent in the several technical disciplines and to the carrying out of surveys and research to ensure the long-term viability of water and land development schemes.

211. One cannot make any precise estimate of what the capability of the developing nations might be in major endeavours of this kind, even assuming the maximum degree of external support. Nevertheless, an effort has been made to study country by country what are the physical possibilities, assuming that somehow the technical and administrative requirements could be met. On this basis, the results of these studies added together on a regional basis give the following picture of what might be feasible objectives for 1985.

Table 4: - Objectives of Land and Water Development Up to 1985

Region	Renovation and Improvement of Existing Irrigation Areas	Area to be Covered by New Irrigation	Development of New Land
	(. . . . . million hectares . . . . .)		
Far East	28	15	24
Near East	12	3	10
Africa	1	1	34
Latin America	5	4	85
Total	46	23	153

212. In the Far East and Near East regions where the potential for increasing arable land is limited, the main objective in water development will be on intensive utilization of existing irrigation schemes combined with a start on new schemes. In the longer term there will also be an addition to the arable land and this by 1985 would have used up 90 percent of the cultivable land potential in the Far East and nearly all of it in the Near East. In Africa and Latin America the priorities and phasing are very different. In these two regions the major programmes relate to expansion of the arable area and these will eventually cover 51 percent of the potential cultivable area in Africa and 42 percent in Latin America.

213. The estimated costs of these three programmes are shown in Table together with regional breakdowns and with an indication of the foreign exchange component. The latter is not necessarily synonymous with need for foreign financial assistance. Some developing countries have ample quantities of foreign exchange at their disposal, but the majority are not in this fortunate position.

Table 5 - Estimated Cost of Water and Land Development for the Period 1974-85

	Renovation and improvement of existing irrigated area		Equipping new land for irrigation		Development of new arable land	
	Total estimated cost	Foreign exchange component	Total estimated cost	Foreign exchange component	Total estimated cost	Foreign exchange component
	(. . . . . million dollars (at 1974 prices) . . . . .)					
Far East	11 700	3 500	22 000	11 000	9 500	500
Near East	6 700	2 700	7 400	5 000	2 500	250
Africa	500	200	2 400	2 400	1 500	570
Latin America	2 100	100	6 200	2 500	12 800	2 500
Total	21 000	6 500	38 000	20 000	30 000	3 820

214. These very large figures for investment covering the period up to 1985 indicate the broad order of magnitude of what is involved in the development of land and water resources in developing countries. What is required is to step up significantly the annual rate of investment from all sources combined to about U.S.$ 8.0 billion per annum in the next four to five years, with a corresponding increase in external financing from about U.S.$ 700 million to a range of U.S.$ 2.0 to 2.5 billion. These investment outlays would have to be continued well beyond 1985.

215. The proposed programmes for the development of land and water resources will require support activities in the international agencies. This will include high-level technical advice, massive training courses for local personnel and of course investment capital. Some of the countries which have unused land and water potential would be able to undertake the major part of the investment from their own resources, but many are small countries with entirely inadequate resources and these would contemplate such programmes only if most of the basic investment could be obtained from outside. Because of internal constraints delaying the implementation of large programmes in poorly equipped countries it must be accepted that these programmes have no specific time limit. In particular the land reclamation programme will have only its first part completed by 1985 and is expected to continue vigorously into the nineties.

216. The opening up of new land areas and the bringing of water to hitherto unirrigated land will raise immense problems of soil fertility management, some of which are understood but some require considerable agronomic research. The physical and chemical properties of soils in tropical and in some sub-tropical areas pose different soil fertility maintenance

issues from those customarily encountered elsewhere. Ill-considered land clearance followed by mechanical cultivation can easily destroy the physical properties of otherwise fertile soils. Research and experiment on soil management will be needed including the use of chemical fertilizers and organic manures, cultivation practices, crop rotations, water control, to mention but a few aspects. But provided the objectives of horizontal development of new food production potential are sought prudently, these programmes, costly though they may be, could bring into existence an immense new flow of food. Indeed, the countries concerned and the international community will be obliged to undertake land and water development of this magnitude if the people who will inhabit this planet at the end of the twentieth century are to have enough to eat.

217. Recognizing the importance of the programmes for improvement of the existing irrigation schemes, for development of new irrigation and for development and settlement of new land for achieving the goals of food production in developing countries, the World Food Conference may wish to:

(i) Recommend the governments of developing countries to initiate programmes for land and water development which, in combination, would achieve the proposed targets.

(ii) Urge the multilateral financing agencies as well as the donor governments to appropriately expand their financial support to programmes of this character.

(iii) Endorse the proposals for surveys and research required in connection with these projects and urge the national and international agencies to make the necessary financial provision.

Chapter 4

Development of Livestock and Fisheries

218. While an expansion of cereals production constitutes in the great majority of developing countries the most pressing need for assuring basic food supplies, the next most urgent requirement among consumers is for an increase in the output of the group of animal protein commodities provided by the livestock industry and by fisheries. Milk shortages already in a number of countries limit the scope of nutritional programmes for young children and pregnant and lactating mothers. In the cities, with their rapidly expanding populations, the demand for meat and fish generally exceeds the supply causing prices to rise until meat and fish are out of reach of the lower income groups. The future of nutritional improvement depends in no small degree on a successful modernization of the developing countries' livestock and fish industries. All demand projections point to a very rapidly rising effective demand for meat, milk, fish and eggs.

219. Nor is this all. Animal husbandry can play a vital role in improving both the income of the small farmer and the diet of his family. Many such farmers possess so little land that, even intensively cultivated, it cannot yield sufficient crops to provide an adequate income, whereas the keeping of some animals can increase materially the value of the farm's output. Similarly, in rural areas, the introduction of fish culture as a supplement to agricultural activities can add to income, create additional employment and diversify local diets.

220. Livestock also provides manure for the fields, useful by-products such as wool, skins and feathers for the home and, in several regions, draught power.

A. Livestock Development

221. FAO's Indicative World Plan for Agricultural Development (IWP) set target rates of growth of output of livestock products for the period 1962-85, relating these on the one hand to the expected growth of demand and on the other to the anticipated potentialities and constraints identified in the developing countries. The growth rates considered feasible for the developing world as a whole were: ruminant meat 2.9 percent, pork 3.9 percent, poultry meat 5.6 percent, milk 2.8 percent and eggs 4.8 percent. Striking are the high growth rates considered feasible for poultry production (meat and eggs), because of the proven rapidity with which modern technology can be applied in the poultry industry, because of the speed at which flocks can be built up and because of likelihood of being able to make available the relatively moderate tonnages of concentrated feed required. What has actually happened since the IWP was prepared confirms this view, inasmuch as the poultry industry has been expanding very rapidly in many countries though not reaching overall the IWP targets.

222. Much more complex are the problems of cattle production, yet it is on cattle that the developing countries will rely for about half their meat supplies in 1985 and for virtually all their milk requirements. Development programmes for the cattle industry always have to contain the three traditional components, namely breeding, feeding and health, and in each of these new orientations will be required to take into account the permanent ecological but changing economic situations of the several countries.

223. Developing countries in the temperate zones have successfully utilized cattle breeds from the developed countries for many decades and face no important adaptation problems. For developing countries in the tropics and sub-tropics attempts have been made, chiefly in developed countries, to create breeds which will do well in these zones and some successes have been obtained. However, until recently the research effort in cattle breeding has been analogous to the situation in plant breeding before the international centres evolved their combination of core and outreach programmes. Similarly the development of feed supplies requires a different approach in most developing countries from the traditional methods of the more advanced countries. While in some parts of Latin America there still exist considerable areas of unexploited grassland, elsewhere the animal feed problem focusses on the management of rangelands in the low rainfall areas where much overgrazing is found as a result of the steady increase in the human and animal population.

224. Most difficult perhaps are the problems of controlling the numerous livestock diseases of the tropics and sub-tropics. While it is known from experience that successful campaigns can be mounted as for example in the eradication of rinderpest, other challenges still remain, for example the control of the tse-tse fly in tropical Africa for which a project is described later in this chapter.

225. These interrelated problems of ruminant livestock have recently become the subject of much more intensive research. There exists for example the International Centre for Tropical Agriculture in Colombia specializing in the problems of the lowland tropics and including cattle production among its main programmes. There is the International Institute of Tropical Agriculture at Ibadan in Nigeria whose work on crops and farming systems will contribute to improving the supply of animal feedingstuffs. There is the International Laboratory for Research on Animal Diseases in Nairobi established in 1973 and engaged in important work on immunology especially concerning trypanosomiasis and theileriosis including East Coast fever. There is also the International Livestock Centre for Africa established in Addis Ababa in 1974 which includes in its programmes the multidisciplinary study of new systems of animal production, of the improvement of rangelands to control the "desert creep", the reproductive performance of ruminants in semi-arid areas and the evolution of complementary animal husbandry systems with rearing on the rangelands and fattening in the crop growing areas.

226. Because many of these activities are of recent date and because research on ruminant livestock inevitably takes time, it is too soon to say that a technological package exists for delivery to the farm

people in developing countries although of course there are a few such countries where because of more favourable environments a progressive livestock industry already exists. In the less favoured countries there exists much scope for reducing the infant mortality of calves and lambs where loss is as high as 50 percent in many cases and for raising, through better supply of feeds, the meat and milk producing performance of animals. Furthermore, many countries are at present inhibited from developing a meat export business because their production areas cannot yet be designated as disease-free.

227. The interconnection between these three fundamental factors in livestock development cannot be overstressed. It would be largely a waste of time to devote resources to expensive programmes for establishing a more productive breed if there is no serious prospect of feeding them properly. It would be a waste of investment resources to open up large areas of hitherto unused land without parallel investment in disease control. And without disease control it would be idle either to elaborate a breeding programme or to plan the expansion of meat production for export except in processed form.

228. Other essential components of livestock development include the provision of roads and transport for getting the animals to market in good condition, the modernization of existing abattoirs and milk plants and building of new ones as well as the creation of a sufficiency of refrigerated storage (see Chapter 5). Many of these facilities could be established by farmers' cooperatives. A constraint which appears at every stage is lack of trained personnel, starting with the farmers, few of whom have had contact with modern methods of livestock management, and continuing through the advisers in animal nutrition, the veterinarians, the staff of the abattoirs and the milk processing plants and not least the inspectors for the hygiene standards of the plants and of the wholesale and retail markets. Training courses will need to be organized in all these fields for the most part locally, but for such specialists as veterinarians and plant managers also externally in more advanced though not necessarily in the most developed countries.

229. Considerable space has been devoted in the preceding paragraphs to the improvement of ruminant livestock principally because this presents the most intractable technical problems in the tropics and sub-tropics. But the necessity for working on these problems should not divert attention from programmes for expanding the poultry and pig industries which in the short and medium term can contribute far more rapidly to increase the supply of meat as was foreseen in the Indicative World Plan. Moreover, poultry and pigs possess two important advantages over cattle. First of all they convert grain and other food concentrates into meat much more efficiently and less wastefully than cattle; this will remain an important consideration in the many developing countries where it is difficult to grow a sufficient supply of cereals for human consumption. Secondly, poultry and pigs lend themselves far more easily to production by small-scale farmers and can make an important addition to their incomes and a valuable improvement to their families' diet.

230. Very considerable capital investment will be involved in building up a more efficient livestock industry in the developing countries. The first and largest item will be the capital locked up in the herds themselves, the stock inventory as it is called, because the animals will be increasing both in numbers and in value. For the additional inventories of ruminants which could be established up to 1985 the investment required has been estimated at some $10 billion, though of course most of this would be spread among the millions of farmers each having very few animals. Secondly, a major investment would be necessary for improving the feed supplies whether in respect to opening up new areas for ranching or extending irrigation for feed crops or regenerating rangelands. Third, there would be an investment requirement for abattoirs, dairy plants and feed mills which might reach $4 billion and $5 billion during the same period. A significant parallel investment would be needed in the pig and poultry industries, a continually increasing outlay for training facilities and finally the financing of the animal breeding research programmes. Most of these investment funds would have to be raised within the countries concerned, but there is clearly scope in the processing industries and in the raising of livestock for export for attracting foreign private capital where this is acceptable.

231. It is suggested that governments which have not already done so should draw up plans of programmes for the development of their livestock sector which would embrace all the features enumerated above. It should cover ruminants, pigs and poultry. It should include quantitative targets for 1985 and, in the case of ruminants which multiply slowly, for a longer period of time. The targets should refer not merely to numbers but to performance. For instance, there should be targets for milk yield per cow and for meat output per head of cattle, for eggs per hen and for the liveweight gain of pigs per kg. of feed. This would assist in monitoring progress from the very low levels of productivity prevailing in so many developing countries. (To cite just one comparison: in 1970-72 the developing countries were on average producing 14 kgs. of beef and veal per head of cattle compared with 75 kgs. in the developed countries). Unless rapid progress is made in the livestock sector, it must be expected that most developing countries will become heavily deficit in animal products by 1985.

Control of African animal trypanosomiasis

232. **The attention of the World Food Conference is called to one investment project of major magnitude and significance. African animal trypanosomiasis, a disease borne by tse-tse fly (Glossina), is one of the chief causes of the underexploitation of the hydro-pastoral resources of tropical Africa. It is estimated that, if trypanosomiasis was brought under control, this zone could carry a supplementary cattle population of about 120 million head. This could produce 1 500 000 tons of meat per year, representing a value of at least US$ 750 million. These flies are also the vectors of human trypanosomiasis (sleeping sickness), a disease which has been brought under control in most countries, but this control**

requires expensive measures for surveillance. In some countries, sleeping sickness continues to be a potentially serious problem with the threat of an epidemic situation. Tse-tse eradication would avoid human deaths, suffering and important economic losses.

233. Progress in trypanosomiasis and tse-tse control techniques now enables large-scale operations to be implemented, aimed primarily at reducing the incidence or the distribution of the disease but resulting in the long term in its total elimination from the areas having a livestock production potential sufficient to justify such an operation.

234. Several methods for trypanosomiasis control are available; they include: rearing of trypanotolerant cattle; tse-tse control by insecticidal spraying,and curative or preventive treatment of animals, but this technique, which at present is the more extensively used, can only be considered as a palliative since it must be constantly repeated. Immunization of animals and biological tse-tse control are as yet only possibilities while genetical control, although promising, could play a role only as one of the components of integrated control. Bush clearing and game elimination cannot now be recommended, principally because of the justified increasing concern for environment protection.

235. The control methods used will have to be adapted to the local conditions and it may generally be necessary to combine several techniques. Probably the rearing of trypanotolerant cattle and tse-tse chemical control, chiefly by aerial spraying, will be the main basis of future large-scale programmes.

236. While this project will be of interest to the majority of the tropical African countries where tse-tse fly is widespread, its principal justification will be for those areas having an important livestock production potential. These areas are provisionally estimated as covering 7 million square kilometres.

237. The western parts of this zone namely the moist savannah and forest gallery areas already possess trypanotolerant cattle populations which could be increased and extended to the areas of central Africa with similar ecological conditions. The total extent of these areas, where the rearing of trypanotolerant cattle could be developed, is roughly estimated at 2 million square kilometres.

238. Chemical tse-tse control would be mainly used in the savannah areas, for which effective techniques have already been developed, although there are still large possibilities for improvement. These areas estimated at approximately 5 million square kilometres could, after tse-tse elimination, be populated by cattle fully susceptible to trypanosomiasis.

239. The implementation of such a large programme would require further research to render chemical tse-tse control more effective and less pollutant. The other techniques should also not be neglected and it would be necessary that research be pursued and enlarged principally on genetical tse-tse control and trypanosomiasis immunology, all methods which can contribute to solving the problems raised by trypanosomiasis.

240. In view of the scope of the programme and of the scarcity of trypanosomiasis and tse-tse control specialists, the project should also include an important training component both at the scientific and the operational level.

241. It must be emphasized that trypanosomiasis and tse-tse control must be considered as an economic operation, which is only the first part of a general plan of economic development. This control must be followed by economic development projects, concerning pasture improvement, livestock management, animal health, livestock marketing and processing, farmer education, agricultural development projects with better use of draught animals and manure. In particular, the areas cleared of tse-tse fly should be rationally settled as soon as eradication is obtained, which is, moreover, the best way to prevent reinvasion.

242. It is consequently estimated that the total cost of the programme might amount to something in the range of US$ 2 to 2.5 billion, though this figure could be exceeded if work on the achievement of effective control had to be continued over a longer period of time. However, during the first five-year phase, characterized by investigations and trials, the expenditures would be comparatively modest, of the order of US$ 30 million a year; the bulk of the cost would be incurred during the later phase of the programme.

243. It is very difficult to evaluate the cost of such a large programme, and it is only possible to establish a rough estimate based on the figures provided by recent tse-tse control operations which result in an average cost of about US$ 300 per square kilometre. The cost of the development of trypanotolerant cattle is much more difficult to evaluate and it is estimated, in first approximation, that a similar average amount per square kilometre should be devoted to this operation. The cost of conservatory measures to prevent the reinvasion of cleared areas is estimated at 10 percent of the cost of the main tse-tse control operations. It is

not possible to define the duration of the overall programme, but it is expected that a substantial proportion could be implemented in about 20 years. The programme should be divided into a series of successive five-year phases, the work plans being established, as the work proceeds, in the light of the results of the previous phases.

244. While the project would be executed through the responsible agencies of the individual countries, the fact that a considerable number of countries would be involved and the fact that the control measures must be consistent since the tse-tse fly knows no national frontiers, point to the need for some international coordinating machinery. This could take the form of an international Bureau for Animal Trypanosomiasis Control whose functions might include:

(a) coordination of national control services and the activities of bilateral and multilateral agencies, research institutes and private organizations active in trypanosomiasis and tse-tse control;

(b) assistance in the preparation of national and regional control programmes;

(c) arranging for the training of control staff and for the expansion of needed lines of research.

(d) establishing on request control teams and control operations in countries unable to initiate such campaigns themselves.

245. A project of African animal trypanosomiasis control would bring many significant benefits. It should result in an increase in Africa's annual meat production of the order of US$ 750 million, representing an excellent rate of return on the estimated investment. It would make large new areas available for food crop production as well as providing the feed for the increased herds of cattle. Above all it would progressively eliminate much human disease and suffering and enable the peoples of these areas to attain higher levels of prosperity and well-being. These benefits would not be postponed till the final completion of the programme but would begin to show already after the first five years.

246. Recognizing the importance of the livestock sector in developing countries both as a source of income for farmers, particularly small farmers, and as a source of supply of commodities needed to improve the quality of diets, the World Food Conference may wish to:

(i) Urge the governments of developing countries to re-examine and strengthen their plans and programmes for livestock development, providing simultaneously for the breeding, the animal nutrition and the animal health aspects;

(ii) Request the bilateral and multilateral agencies to examine what contributions they can make to intensify research in the breeding of ruminants suited to tropical and sub-tropical environments;

(iii) Invite international agencies and other potential investors to explore the possibilities of expanding their investment in animal production and in milk and meat processing plants in developing countries;

(iv) Recommend FAO in conjunction with the governments of the countries concerned to prepare and launch a long-term programme for the control of African animal trypanosomiasis as a project of high priority, seeking the necessary financial, technical and other support from bilateral and multilateral agencies and for this purpose to establish an international Bureau for African Animal Trypanosomiasis Control.

B. Fisheries

247. The developing countries' share in the world's fish catch is now between 20 and 25 million tons annually out of a world total of around 65.0 million tons. By 1985 the developing countries could double their supplies of fish available for human consumption and thus make a significant contribution to increasing the high quality protein component in the diet of their peoples.

248. Such an expansion could be achieved by a combination of various measures whose relative importance will vary according to the characteristics of individual countries' fisheries. These are: (i) reducing wastage at sea, (ii) reducing wastage on land, (iii) diversion to human use of part of the fish at present converted into animal feed, (iv) further exploitation of underfished wild stocks and (v) expansion of various forms of aquaculture. In addition some gains can be expected from management of overexploited stocks, but such action is better taken before the stocks become depleted and excessive fishing effort builds up.

249. Every day in the course of ocean fishing a large quantity of so-called "trash" fish is thrown back into the sea. This occurs particularly where fleets are specialized in the catching of one single species such as shrimp. Most of this trash fish is suitable for human consumption; much of it consists of edible but unfamiliar species which could be marketed if it could be converted into products already acceptable to consumers. It is estimated that over the world as a whole some 10 million tons of fish are lost in this manner, and this volume of waste might double by 1985.

250. Once fish is landed considerable spoilage occurs as a result of bad handling, preservation and storage, losses being highest in the countries least well equipped with refrigeration and processing facilities. In the developed countries considerable reduction in waste has been achieved by greater production of frozen fish and the development of a cold chain. Substantial losses still occur in tropical conditions due to lack of proper storage and distribution facilities. Refrigeration may help in this respect also, but not necessarily in the form of a cold chain; also needed is the development of a cheap and efficient means of wrapping fish or otherwise repelling beetles during storage.

251. Currently, about one quarter of the world's fish landings are reduced to fish meal and oil. Part of this catch, with proper handling and preservation, could be utilized as fresh fish; another part could be transformed into products suitable for human consumption. One must recognize here the existence of a competitive demand as to end use. Thus, during periods such as the present when prices of livestock feed concentrates are extremely high and substitutes for fish meal are in short supply, it may not

be economically attractive to divert much of the raw material of fish meal to human use. If later the prices of alternative feed concentrates settle at more reasonable levels, there might be scope in certain countries for obtaining more food fish from this source.

252. A quite different but equally important direction in which action is required is to prevent a fall in production of the heavily exploited species through better management. Management is also required to prevent the build-up of wasteful fishing effort - it has been estimated that the rewards for better management are of the order of US $1 billion annually. Conservation of the resource base must form a part of any strategy for the future of world fisheries. As time passes and more and more stocks become fully exploited, the relative importance of management and development - in the sense of increased production from wild stocks - can be expected to shift, with management (whether of international fisheries or stocks exclusively within national jurisdiction) becoming increasingly necessary.

253. Already the fish stocks of northern temperate latitudes are, with few exceptions, fully exploited and either being managed by international agreement or urgently in need of such management. This process has been taken furthest in the Northwestern Atlantic, where catches of nearly all the stocks of commercial interest are now limited by international agreement. Recently progress has been made in implementing similar control in the Northeastern Atlantic, e.g. the North Sea herring, but further action is urgently needed in this area if the total yield is to be maintained at its present high level. In the North Pacific certain high value species, e.g. salmon and halibut, have been under international management for many years, but as in the North Atlantic action is required for the protection of a number of presently heavily exploited species. The number of stocks in other areas of the world, including many stocks harvested by developing countries, which are either under effective management or in need of it is growing rapidly.

254. There are however other ocean areas, still rich in demersal and pelagic fish, where substantial increases in production could be achieved by expanding fishing activity on certain stocks. Such areas include the Southwestern Altantic, parts of the Indo-Pacific region and the Northwestern portion of the Indian Ocean. All these areas are adjacent to developing countries capable of building up fishing fleets and the supporting preservation and handling facilities. In some of these countries, however, the consuming public outside the few fishing ports is not yet accustomed to purchasing fish and it would be necessary to organize education and fish promotion campaigns; also, even in the districts accustomed to fish eating, changes in consumption habits would be necessary to take advantage of the species which are abundant but unfamiliar.

255. Aquaculture in fresh and brackish waters is at present estimated to cover about 2.2 million hectares and together with cultured sea fish to contribute some 5 million tons to the world's supply of fish. Much of the potential area for expansion of aquaculture consists of mangrove swamps,

estuaries, fresh and salt water lagoons, shallow coastal waters, inland lakes and artificially created fish ponds. Apart from this last, there is virtually no competition for space between expansion of aquaculture and expansion of crop production.

256. Southeast Asia is probably the region which offers the greatest scope for aquaculture at present, partly because cultural practices are already well established and partly because the species produced are accepted for consumption by the lower income groups whose opportunities for obtaining animal protein from meat will long remain extremely limited. In addition, the tropical and sub-tropical areas of Oceania, Africa, the Near East and Latin America offer favourable natural conditions but cultural practices are not yet so widely known as in Asia.

257. Technical know-how in aquaculture is advancing rapidly; in some recent instances production per unit of area has been increased as much as tenfold within a period of two or three years. What future techniques will be evolved is difficult to predict but already encouraging results have been obtained from "aqua-range farming" and from "cage and raceway" systems of management.

258. Aquaculture can be successfully organized both in small units in rural and coastal areas and in large commercial operations attracting private investment capital. The small-scale units in freshwater culture can be conveniently combined with agricultural operations, e.g. good results have been obtained by rotating fish, soy beans and rice. Fish-farming can be combined with duck production and fish residues can be converted locally into livestock feed. As regards the larger-scale operations benefits have been found in vertical organization combining seed production, rearing and marketing.

259. The main needs in the field of aquaculture are for increased government support in the form of grants, loans at subsidized interest rates and similar incentives, as well as an increase in the number of qualified extension workers. Given sufficient interest and determination on the part of the authorities, and in particular attention to the above factors, considerable increases in production could be achieved within the next decade. Unless an important breakthrough is made in the utilization and marketing of unconventional species (i.e. those types of fish not now exploited) it is likely that continued growth in world fisheries production will by the end of the century be dependent to a substantial degree on increases in output from aquaculture.

260. Having examined the various approaches which in combination could significantly increase the supplies of fish available to developing countries, it remains to consider certain other measures which should form part of the package of fisheries management and development. An essential prerequisite for successful management and for the maintenance of high yields from heavily exploited fisheries is the scientific assessment of the status of the fish stocks, which in turn requires regular monitoring of the stocks

and of the catches from them. This monitoring, involving the collection and compilation of better statistical data from the commercial fisheries, sampling the catches for age and size composition, and the surveying of the fish stocks, will need greater attention and emphasis, both at the national level and, in respect of stocks exploited by more than one country, at the regional level if the production from natural stocks is to be maintained.

261. In the field of fish handling, processing and distribution, attention has been drawn to certain action required to reduce losses. The main need in this respect is to apply more widely and intensively existing knowledge, although further research is required to improve the storage life of fish both at sea and on land as well as to develop new products. The emphasis of action and research programmes in this field will vary from region to region. Thus in the Central America/Caribbean region considerable benefit could be derived from the utilization of fin fish presently discarded by shrimp trawlers; in the inland fisheries of Africa losses can be reduced by overcoming the problem of insect infestation and other forms of deterioration; in the Indo-Pacific region increases in the supply of fish can be obtained by improving the quality and acceptability of low grade species through product development.

262. A third general need is to improve the institutional arrangements for disseminating the findings of research to the fishermen. This requires government allocation of funds for training fisheries advisory workers, especially to work with fish culturalists and small-scale fishery enterprises, whether marine or freshwater. In this activity more extensive assistance could be sought through international agencies.

263. Large-scale commercial fisheries and fish processing operations offer attractive opportunities for private investment and already there exist numerous examples of "joint ventures" in which the developing country makes available the fishery resources, together with local labour and materials, while the foreign enterprise provides know-how and investment capital. Japan already participates in joint fishery enterprises in some 40 developing countries of which about half are in Asia and Oceania, and which contribute to supplying the steeply rising demand for fish in Japan, as well as the transfer of technology to and creation of employment in developing countries. Tripartite joint ventures can also be an attractive formula for financing, the third party being such agencies as the International Finance Corporation, the Private Investment Company for Asia or the Atlantic Community Development Group for Latin America, to mention but a few examples.

264. In all these ways, through research, advisory services and the mobilization of investment and know-how, the developing countries' governments can foster fisheries development. Because of the potential contribution of fish to the improvement of human development it is suggested that each government might review the directions in which the national fish supply could be most rapidly and economically expanded and implement programmes designed to realize defined targets by 1985.

265. In the light of the foregoing, the World Food Conference, calling attention to the potential importance of fisheries for the improvement of human nutrition in developing countries, may wish to:

(i) Urge individual governments through participation in cooperative programmes and other means to improve the utilization of fish catches. To this end it urges special attention be given to the problem of (a) presently unutilized catches of trawlers, particularly in the Caribbean and Indo-Pacific areas, (b) problems of insect infestation and other forms of spoilage in the inland fisheries of Africa and (c) improved handling at sea and after landing, especially of small pelagic species;

(ii) Recommend governments to examine more urgently the possibilities of increasing production either through increased fishing of those species which are presently underexploited, or through the further development of aquaculture;

(iii) Urge all countries to pay due regard to the rational management of fish stocks, including full cooperation with established international fisheries bodies. To this end it requests governments and organizations to re-examine and expand their contributions to scientific research at national, regional and international levels with a view to improved monitoring of world fish stocks and strengthening of collaborative action in this field.

Chapter 5

Research and Technology

266. A comparison of agricultural practice and its supporting scientific services before the second world war with the situation today shows that a technical revolution has occurred in the agriculture of developed countries, whose only historical parallel is with the Industrial Revolution in the nineteenth century.

267. Over the last three decades considerable progress has also been made in introducing some aspects of this new agricultural technology into developing countries, but it is more narrowly focussed; and the extent to which most farmers there are still unable or unwilling to adopt the innovations originating in the more advanced countries is well illustrated by reference to the use of the material inputs on which a highly productive agricultural sector now largely depends.

268. In terms of world production 85 percent of the pesticides and 75 percent of the chemical fertilizers are used in developed countries on only 30 percent of the world's arable area. The distribution of utilization of agricultural machinery is very similar to that of other inputs, some three quarters of the total being used in developed countries; while there is a serious deficiency of power, especially for critical ploughing and seedbed operations, in the developing world.

269. A main reason for these low levels of input use is that until the mid-1960s the application of industrially based agricultural technology in developing countries was principally confined to the export and industrial crops which occupy a relatively small proportion of total agricultural area compared to food crops and pastures, (on which the bulk of inputs in developed countries are used). This was partly the result of substantial technical and financial backing from industries dependent on agricultural raw materials, partly because it was easier to finance research on such crops (rather than food crops) from cesses on producers, merchants or exporters, and partly because of a structure of large plantations in some of the main producing areas which facilitated the use of inputs, and a well developed infrastructure for credit and markets. There were also clear cash incentives to improving yields and quality, and foreign exchange earnings to pay for imported inputs.

270. As a result, yields of such crops as cocoa, tea, rubber, cotton and oil palm, have risen substantially in a number of developing countries, unit costs of production have fallen despite increasing use of fertilizer and other chemicals, quality has improved, and the range of end-uses has been widened to enable natural products to meet competition from synthetics.

271. By contrast, progress in the critical sectors of food crop and ruminant livestock production has lagged, and productivity per hectare and per animal has risen disapppointingly slowly in many countries, expansion of harvested area remaining the main source of growth of output.

272. The main exception to a general rather unsatisfactory picture on the food front was the emergence of the so-called "Green Revolution". This was based on the simultaneous elimination of barriers to increased yields by the breeding of new wheat, rice, and maize varieties highly responsive to irrigation and fertilizers, and the provision of these varieties to farmers after appropriate field testing, together with the appropriate package of inputs and cultivation practices. This package gave, under the right conditions, the demonstrable and dramatic increase in production which had not been attainable with the earlier piecemal approach of attempting to overcome the barriers one by one, where each success raised the per hectare yield ceiling only a little.

273. The increases in production achieved in Asia have also been of great importance in disposing of two myths. The first of these was that agricultural research as a form of investment for developing countries was either slow-yielding or low-yielding, or both; the second, that even if research produced potentially successful results the average farmer growing food crops was too subsistence-minded, poorly educated or risk-conscious to utilize them. The fact that the use of the new varieties and some or all of the related input package has been adopted on over 21 million hectares in 20 countries in only six years with obvious success in increasing output shows that where a clear economic advantage is demonstrable farmers will accept new technology, and that its adoption cannot possibly have been confined only to landlords and the larger farmers as some critics have suggested, although the latter may be the innovators. 1/

274. In contrast to the results achieved in recent years through plant breeding and its supporting disciplines the post-harvest technologies remain extremely deficient in most developing countries. Here it is rarely a question of new research being needed but rather one of securing more widespraad adoption of well-known technologies. For example, the poor storage facilities for cereals and other foods, except in major cities and ports, are responsible for heavy losses. Similar losses are caused by the shortcomings of much of the processing equipment for cereals, oilseeds and other crops. The problems of modernizing food storage, processing and distribution are considered later in the present chapter.

A. Agricultural Research

The Organization of Research

(a) International

275. The "Green Revolution" was the result of plant breeding programmes

1/ This was initially the case in Mexico, but over fifteen years the area under high-yielding varieties has risen to include 95 percent of the total wheat area of over 800 000 hectares in that country. A similar percentage of the wheat and rice area in Egypt is sown to high-yielding varieties.

pursued intensively over a period of years dating back to the late forties, in rice at Los Baños in the Philippines and in wheat and maize at Chapingo in Mexico. At both these centres a multi-disciplinary approach to plant breeding problems was adopted and this produced not merely new varieties of seed but a package which included recommendations on the water and fertilizer requirements of the new seeds and on their protection against pests and diseases. In both cases the selected material was sent year after year to collaborating research stations in countries having suitable ecological regions where the seeds were tested for adaptability to local conditions. Very often the most promising varieties failed to resist one or other of the hazards in these new environments, so that a further process of breeding and selection had to take place at the parent centre. In technical jargon the research activities at the centres are referred to as 'core programmes' and the trials and tests in other countries as 'outreach programmes'. In the case of the Mexican wheats, for example, a prolonged process of breeding, trials, rebreeeding and renewed trials was necessary before varieties suitable to the conditions of India and Pakistan were stabilized and could be distributed in substantial commercial quantities. It is important to realize that, however generously financed, research programmes of this character are likely to take at least 15 or 20 years to achieve important results.

276. In the Philippines rice breeding research was organized into an international centre in 1962 followed by a similar transformation in Mexico in 1968. Since then, further centres have been established which deal with sorghum, millets, chickpeas, cowpeas, pigeon peas, field beans, cassava, potatoes, sweet potato, beef production (Africa and Latin America), animal diseases, and swine production. Farming systems for the low humid tropics (both Africa and Latin America), for semi-arid regions, and for the rice growing areas of Asia are under intensive study at these centres.

277. All the centres follow a problem-oriented multidisciplinary team approach. Depending upon the problem being studied, members of the teams who come from many nations include geneticists, plant breeders, plant pathologists, entomologists, agronomists, agro-meteorologists, soil chemists, soil microbiologists, cereal chemists, economists, social scientists, statisticians, agricultural engineers, communication specialists, animal nutritionists, veterinarians and others. The centres carry out active training programmes both in the applied and production side and in the more basic scientific phases. Participants in these training programmes come from countries in which the commodity is grown and they have jobs to return to in their home countries.

278. In addition to their 'core' research and their training programmes the international centres have many close ties and cooperative linkages with national programmes working with their commodities. Frequently they participate in national programmes to upgrade research or to bring special emphasis to important production programmes. They hold workshops and conferences on an international scale and they exchange breeeding materials and data on technology with colleagues around the world.

279. The recognition of the need to give stronger support to these Centres and to national agricultural research within developing countries led to the establishment of the Consultative Group on International Agricultural Research. This is a significant new venture in international cooperation started in 1971 under the co-sponsorship of FAO, IBRD and UNDP in response to a felt need to reinforce the work of the four International Research Institutes then in operation, and to extend the scope of the crops and problems receiving a major interdisciplinary research effort. 1/

280. As well as supporting the International Centres, the Consultative Group also finances the recently created International Plant Genetic Resources Board which provides the means for the establishment of a strong collaborative programme for collection, exchange, storage and evaluation of the world's plant genetic resources, linking developed and developing countries and the International Centres. Such a coordinated effort both for plant and animal germ plasm is essential to support future breeding efforts, but even with the establishment of the new Board it is questionable whether this is yet adequately appreciated in terms of financial support and trained manpower. 2/

281. In addition to this an Agricultural Research Information System is now being established by FAO with assistance from members of the Consultative Group and with links to systems in developed countries. 3/

(b) National

282. While the organizational technique of 'core programmes' coupled with 'outreach programmes' is suited to plant breeding research, research in other fields may need to be organized in different ways. For example, the study of the best selection of crops for a multiple cropping programme needs to be almost entirely local since the answers depend not only on agronomic considerations but on the availability of transport and the nature of the

1/ It is an informal funding association of all the major aid donors, international agencies working in agricultural development, regional banks, private foundations, and elected representatives of two countries in each developing region. It is assisted by an expert Technical Advisory Committee whose task is to identify and make recommendations to the Consultative Group concerning major gaps in current agricultural research related to the needs of developing countries, indicate which of these it rates as high priority and suggest approaches to getting the job done. The Secretariat of the Group is located at the World Bank, and the technical Secretariat at FAO.

2/ The International Rice Research Institute alone, which has one of the most advanced programmes, has over 30 000 accessions in its germ plasm bank, with an immense potential for further exploitation, in urgent need of characterization and evaluation for use in genetic improvement work.

3/ This sytem known as CARIS aims to record on the computer and through periodic publications agricultural research currently in progress in developing countries, where and with what resources. A pilot project covering fourteen West African countries has just been completed. World coverage is planned.

markets. Generally speaking, research that is mainly social and economic in content tends to be location-specific, for instance agrarian reform or the settlement of nomads. Therefore, the national programmes have to be strong, partly because they provide the outreach component of the work of the International Centres, partly because of the location-specific research which must be carried out within countries and partly because it is only through the national programmes that the individual farm can be reached with new technology.

283. While some developing countries have in recent years come to recognize the importance of agricultural research for achieving an expansion of food production, it is unfortunately true that in many countries only limited progress has been made in recent decades. In most developing nations a major part of the farming areas still lacks access to or services by effective research stations.

284. One of the most serious difficulties is shortage of trained personnel. In a number of developing countries the departments or agencies of the national Ministries of Agriculture responsible for development-oriented research frequently have very limited scientific manpower resources. 1/ FAO studies show that over the developing world as a whole, 70 percent of research institutes have less than ten trained research workers and in most regions between 50 and 60 percent of the institutes have less than five trained workers. Until this situation is improved, it will not be possible to have coordinated multidisciplinary research, involving the collaboration of national and provincial agencies as well as universities, conducted on a national scale.

285. Scientific staff are generally poorly paid relative to the value which a good research programme has to the nation's economy. Men in whom major investment has been made in training may, as a result, seek opportunities in administrative service which offer better pay, or in research posts abroad or in private industry.

286. Poor physical facilities inhibit both output and reliability of research in many developing countries. While there are usually a considerable number of "farms" variously labelled as experiment stations, seed farms, livestock breeding farms, these tend to be of inadequate size, the experimental fields have not been laid out to minimize soil variability, water supplies are uncertain, laboratories and offices are inadequate, field machines and laboratory equipment are deficient, and transport is limited.

287. Another essential component if research is to succeed is to create an effective "delivery system" including all the institutions and

1/ For example, the Ministries of Agriculture in several countries of Asia had fewer than 5 Ph.D. and fewer than 10 M.Sc. degree level scientists in their entire organizations when reviews were made within the past five years.

people involved in getting the technology actually applied on farms. Very few innovations sell themselves or can be applied successfully without close cooperation with and involvement of farmers 1/, and moving new technology from the experimental stage to farmers' fields is generally a complex process requiring the continuing cooperation of many individuals and agencies. Research scientists, field testing officers and farm level extension workers are all involved. In the most successful examples of this information transfer system, credit agencies, farmer associations, agricultural universities, private industry, governmental bureaux and others all play a part. It is a two-way process, and the researcher is constantly kept aware of the extent to which his output of technology applies or does not apply to conditions at the farm level.

Lessons from Recent Experience

288. The outstanding conclusion which can be drawn regarding the application of agricultural technology in the world of today is that research pays 2/. Yet expenditure on research in developing countries in 1970 was equivalent to only 0.25 percent of agricultural GDP, whereas that in the developed world averaged nearly 1 percent and in some countries such as Japan, was as high as 2 percent. Yet it is in the least scientifically advanced countries which are spending the least on research and need it most that the potential payoff could be highest.

289. The second group of lessons which have been learned concerns certain scientific problems both in the basic research activities and in the adaptive application of the results. Thus, in plant breeding it has proved easier to develop high-yielding and disease-resistant varieties of some crops than of others. Likewise in plant protection some pests and diseases have proved relatively easy to control while others are more intractable. Again a number of gaps have been revealed in subjects covered by current research programmes, gaps originating in the linkages between disciplines. One example of this causal sequence is the need to expand meat production in many African countries and the consequential problems of tse-tse fly control and the management of tropical soils and the maintenance of their fertility. Numerous other examples could be given.

1/ "Remote sensing", certain applications of atomic energy to agriculture through mutation breeding, soil isotope work and some aspects of pest control (blanket aerial spraying, release of sterile males, vaccination) may be exceptions.

2/ After investigating a number of independent studies on returns to research Evenson has claimed that 2 to 3 times as much growth can be obtained per dollar spent on research in developing countries than from any other form of investment. Investment in Agricultural Research, a survey paper by Robert Evenson, Yale University, prepared for the Consultative Group on Agricultural Research, October 1973.

290. A major consideration is to take heed of the problems which can be indirectly accentuated through the drive for agricultural development, problems which include the exhaustion or degradation of non-renewable resources, pollution of the environment, and inadvertent changes of the climate of the biosphere. Ill-considered action in any one of these sectors can set off a chain reaction in one or more of the others, and there may sometimes be incompatibilities between an all-out drive to increase world food production and solutions to these other problems. The task is therefore not merely to increase food production, but to increase it in a way which will not be incompatible with the wider goals of human development, and which will not sacrifice the long-run goods for short-term expediency.

291. There must therefore be a constant long-term search involving both basic and applied research for new techniques to maintain acceptable rates of growth in food production which are less demanding on non-renewable sources of energy and other natural resources, and more suitable to small farmers and disadvantaged areas; while at the same time striving to expand output through more conventional technical means to meet the immediate emergency and to buy time.

292. The third lesson from the recent past is that success in the application of new technology depends not solely upon its own inherent soundness but also on the solving of parallel problems in the social and economic sphere. Often the biggest obstacle is not the local applicability of the new technique but the resistance of local people who have not been helped to understand its benefits. In other words, it is realized that what is required is not only a balanced technological package but also an integrated interdisciplinary approach. Further, there has to be an effective "delivery system" as well as a training programme.

293. The fourth group of lessons relates to the manner in which agricultural research is organized. For example, although the combination of research at international centres with the so-called outreach programmes has generally proved successful, there may be pitfalls. For instance, attempts to transfer exotic technology ready-made between different areas often fail, failure being the more likely the wider the differences in ecological and social environment between the point or origin and the point of use. That is one reason why 'core programmes' should be undertaken in an environment reasonably similar to that in which their results have to be applied. Observation of this principle was probably a major factor in the success of the Mexican wheat programmes and of the rice programme in the Philippines.

294. Certain problems such as the control of rinderpest and the desert locust can be mastered through a more or less global attack, with the cooperation of a number of affected countries. Control of the tse-tse fly will probably provide another example. Other important problems are location-specific in the sense that they can be studied only in the area where they arise. The approaches must be many and flexible.

295. The fifth lesson drawn from past experience is the enormously increased investment needed to develop the quantity of agricultural technology which the world needs, an investment justified both on humanitarian grounds and because it pays. In order to fill the subject-field gaps and in order to strengthen the weak links in the individual countries' research systems and delivery capabilities, much greater outlays will be needed by the governments of the developing countries, as well as through international channels, firstly to support the efforts being made in individual countries and secondly to undertake the kinds of work which in any case have to be undertaken at international centres.

Orientation of Future Action

296. What then are the directions in which adaptive agricultural research could most fruitfully move forward? Where are the more serious gaps in agricultural knowledge which today put a brake on the expansion of production? What should be the next steps at national level and at international level? What are the financial implications of the efforts which need to be made? These several fields of action will now be examined in turn.

(a) Subject-gaps to be filled

297. Up till now first priority in agricultural research for the developing countries has been assigned to cereals and this should continue to be the case for the coming years because cereals remain the basic food and because several hundred million people do not have enough to eat. Moreover, in some species of cereals there are real prospects in sight of developing varieties which combine high yield potential with higher total protein and a better amino-acid balance which could be of great significance for human nutrition.

298. Wheat, maize and rice have for some time received significant attention and are the subject of ongoing programmes. However, the rice varieties developed and released till now require considerable plant protection, controlled water application and a high level of management. Varieties, particularly of upland and of deepwater rice, are needed which have a wider spectrum of resistence to pests and diseases and do not require such skilled management.

299. Barley and triticale 1/ deserve a greater research effort, the former because it is an important foodstuff in several countries notably in the Near East, and the latter because of its potentially high yield, high protein content and potentiality for flourishing on marginal lands. In addition more work is needed on millet and sorghum, both of great importance in the drier areas of the tropics especially in Africa.

1/ This is a hybrid between triticum (wheat) and secale cereals (rye) species.

300. There is another aspect of cereals research which merits immediate attention because of the current supply shortages and price difficulties affecting fertilizers and pesticides, and because of energy and population problems. This aspect concerns ways and means of improving the biological efficiency of cereal plants so as to enable them to reduce their dependence on purchased inputs without sacrificing yield. In this connexion too, as mentioned earlier, greater activity should be devoted to the classification of plant and animal germ plasm.

301. The food legumes, although after cereals the next most important source of protein in the diet of the lower income groups, offer less promising opportunities to research workers because of their susceptibility to numerous diseases and insects as well as their relatively low ceilings on yields. Both physical and morphological factors are involved. However, centres already exist for specific legumes in India, in Africa and in South America, and new international programmes are under consideration for groundnuts, soya, broad beans, lentils, field peas and certain other legumes. Breakthrough in several of these crops may not be attained before the eighties.

302. At present no work is supported at international level on several of the annual oil seeds such as sunflower, safflower and rapeseed, although their oils are important in the diets of many developing countries. There appears to be a strong case for giving them higher priority.

303. More work is likewise justified on the root crops such as cassava which provide the basic energy requirements of perhaps some 400 million people.

304. In animal production, sufficient knowledge already exists to permit a large expansion in pig and poultry production; priority in livestock research is certainly justified for ruminants. Facilities for livestock research at international centres are of comparatively recent date but, as mentioned in Chapter 4, there now exist major programmes at centres in Colombia, Nigeria, Kenya and Ethiopia dealing with breeding, feed supplies, disease control and management systems. By the nature of the problems new breakthroughs cannot be expected quickly. Far too little research has as yet been done in developing countries on aquaculture, although scientific fish farming could contribute important quantities of protein to imbalanced diets.

305. Improvement of pastures is basic to animal husbandry especially in the semi-arid regions. Trials of drought-resistant legumes and selected grasses need to be more widely undertaken in order to raise the carrying capacity and/or improve the nutrition of the existing herds.

306. In Chapter 3 it was shown that to meet the food requirements of 1985 large areas of new land will have to be brought into cultivation especially in Africa and South America. To make this possible the necessary resources should be allocated to studying the soil problems of the savannah belts and to the management of the soils which are exposed

for the first time when tropical rain forests are cleared. There is here a complex of problems which needs to be solved before arable farming can be maintained permanently in these districts.

307. While, as can be seen from the foregoing examples, the topics selected for priority in research efforts are mostly those which have immediate application in some or all developing countries, it would be a grave mistake to neglect other problems of a much more fundamental character, a solution to which could benefit all parts of the world. These global topics might better be undertaken in developed countries because of their sophisticated requirements, their high cost and their long-term nature. Examples include the evolution of new "genetic engineering" and propagation techniques; better understanding of the nitrogen-fixing mechanism; further insight into energy/agriculture relationships, including the better and cheaper utilization of sunshine, wind and water as energy sources, the improvement of photosynthetic efficiency of plants, basic aspects of radiation technology;1/ pollution studies as related to agriculture; improved means of monitoring and understanding weather and relating weather patterns to crop and livestock production and research (perhaps one of the more grossly neglected aspects of science); developing more sensitive global machinery for analyzing and understanding issues related to world food policy, the factors bearing on it, and their future implications; and so on.

(b) Strengthening National Research

308. However significant the international effort, the great bulk of the research on developing countries' agricultural problems must be carried out in the developing countries through their own institutions. A pre-requisite to any strengthening is to obtain from national leaders some formal recognition of the vital need for a sustained flow of adapted new technology for food production and overall development and some serious commitment to providing the required research facilities on a more ample scale than hitherto. This in turn requires a special effort by those in charge of research to acquaint the government leadership with the kinds of research most critical to national development and the types of organizations and facilities required to undertake it.

309. There are two aspects of the strengthening process: first, organization and management; secondly, the choice of programmes. The organizational review should include:

1/ There are, of course, already wide uses for techniques derived from atomic energy resources in agricultural research. These include the induction of mutations as an aid to plant breeding; numerous applications in pest control, such as the sterile male technique; the use of tracer isotopes, neutron probes, etc. in work on soil-plant-water relationships and plant nutrition; food preservation by irradiation; the development of radiation-attenuated vaccines for the control of pathogenic parasites in livestock etc. Further advances may be expected from future basic research.

(i) the creation of a national reasearch "system" designed to concentrate on priority subject-fields and to serve the different farming regions.

(ii) commitment of financial resources on a continuing secured basis for expanding and improving the manpower and facilities components of research, including training.

(iii) emphasis on ensuring the interdisciplinary and inter-institutional character of research programmes.

Among these requirements the one which needs to be singled out for special comment is training.

310. What is required here is first for each country to make a more precise determination of its trained manpower needs for agricultural research, identifying the requirements of specific programmes for specialists in various disciplines. To provide training at higher levels the graduate and post-graduate facilities at universities should be mobilized; the training facilities of the international centres should also be utilized. Then the research stations should themselves conduct training courses, while at district and community level workshops should be organized for the training of local leaders and innovators.

311. One important link in the chain which should extend from the laboratory to the farmer's field if research and extension are to generate change is the crop production specialist. He should be an individual who is in constant touch with the researchers to discuss what phases of their already field-tested results may now be ready for trial by farmers. He is equally in touch with the extension staff and may help test the new procedures under genuine farm conditions or put them directly in the hands of selected farmers for trial. Depending upon results he may then assist in directing more research effort toward the problem or in mounting a major effort toward the wide adoption of the practice. Ideally, he should have at his disposal extension specialists in specific aspects of the technology, to help sort out answers to particular problems.

312. Another example is the need to concentrate greater training effort on the farmers themselves so that through study of their motivation they can some to accept more willingly and rapidly the new technologies (see recommendations in Chapter 6).

313. Mention should be made here of a promising organizational experience though it concerns as much the delivery system as the research itself. This is the system of production-oriented action programmes involving applied multidisciplinary research units and pilot expansion activities over a fairly large area which are proving their worth in several countries as a means of accelerating the understanding of the process affecting the application of new technology and thus the achievement of national production objectives. Such programmes offer a potentially rapid means of testing

new technology, identifying the technical, social and economic factors affecting its adaptation and feeding back information on its suitability to the research institutes and to the national planners. A few countries already have projects of this kind in operation, for example the various All-India Coordinated Commodity and other programmes, the Plan Puebla, the Bimas programmes in Indonesia, and the Masagana 99 project in the Philippines. The hope is that programmes of this type could significantly speed up the conversion of farms and farmers to the new technologies.

314. The second main aspect of strengthening is to apply rigorously the principle of selectivity in choice of research programmes. It is all too common in small countries possessing extremely limited resources to find efforts being made to build up a national agricultural research institute at which for prestige reasons the ambition is to cover all the agricultural disciplines up to graduate level and then, on grounds of equitable sharing, to encourage each department to have its own action programme. This misallocation of scarce resources prevents sufficient attention being focussed on any one single problem, so that none are solved. To select a few issues and concentrate resources upon them may involve taking invidious decisions, but it will be in the national interest. The content of the short list of priority topics will vary from country to country according to local circumstances. Most of the items should be problems of immediate urgency, but the decision-makers must also look ahead and, anticipating the nation's needs in five to ten years time, must initiate now the programmes slow-maturing in character whose results will be demanded then.

(c) Strengthening the International Centre System

315. The number of international centres for agricultural research has been increased from four to eight during the past four years, enabling the coverage of a greater variety of commodity and non-commodity problems. However, as has been seen, a number of vital problems still remains to be researched, partly because not enough centres are yet in existence or because the problems are of a regional nature and require regional treatment. Examples of the areas in which additional research activity could be very rewarding are as follows:

316. A regional centre for the Near East and North Africa. The climate of the Near East and North Africa where precipitation is erratic and almost entirely confined to the relatively short winter period, followed by an intensely hot summer, presents special problems for the intensification of agriculture. Consideration is now being given to the creation of a centre to deal with commodity and farming systems research specifically for these conditions, with the particular objective of improving the present low efficiency of utilization of land and water resources. Besides undertaking research on rainfed and irrigated farming systems and crop-livestock integration, it would collaborate closely with other international centres working on crops of importance to the region and develop a strong adaptive research and training programme related to the staple cereals (wheat and barley), grain legumes, and pastures and fodders.

317. An integrated plant nutrition centre. Factor-oriented research centres have not as yet been sponsored as part of the international network. A strong case could be made for a departure from strict commodity orientation to focus major attention on plant nutrition. Such a centre might develop means of maintaining or increasing production in the less developed countries without depending quite so heavily on increasing amounts of scarce fertilizer inputs. Concomitant studies would be indicated on means of making more efficient use of chemical fertilizers, on re-cycling nutrients which are presently lost through careless handling of crop residues, wastes etc., and on microbiological aspects of plant nutrition such as nitrogen fixation.

318. Land development and tropical soils. The development of the world's underutilized land resources will require solving some complex and little understood soil problems. The extensive savannahs of South America, for example, are reasonably favoured in climate and topography for both crop production and animal production, but soil problems greatly limit their use at the present time. The international centres research parts of this problem in connection with their commodity programmes, but many aspects are overlooked because they do not bear directly on the commodity concerned. Similar comments could be made about major underutilized river basins such as the Amazon or the Congo. Consideration should be given to further and more comprehensive work on these problems. This could involve institutions in the developed countries, national programmes in the developing countries and the international centres. Pilot projects for development based on these investigations might also be considered in due course.

319. Some of the existing international centres also need to be given additional resources to enable them to perform their functions more effectively. For instance, with more funds they would be able to multiply their outreach programmes and thus speed up the adaptation of selected new varieties to local environments. Also they could then find time and resources for closer cooperation with national research organizations; the recently negotiated Memoranda of Agreements covering cooperation between IRRI 1/ and the All-India Coordinated Rice Improvement Programme, and with the Philippines Council for Agricultural Research furnish patterns for this type of cooperation. Or again, given more resources, the international centres could provide more training facilities for nationals of developing countries and organize more workshops for the exchange of scientific information. When it is remembered that according to the latest available figures (1970) a total of more than 1.5 billion dollars was being spent on agricultural research all over the world, and that in 1973 less than 24 million dollars was being spent on the international centres, it is apparent that a substantial increase in their financial resources would not place an undue strain on the donor countries (see Table 1).

(d) Financial Requirements

320. The suggestions in the preceding pages for the filling of gaps in research programmes and for the expansion of research facilities both in the developing countries and internationally, all imply that more

1/ International Rice Research Institute.

Table 6: Annual Public Sector Expenditure on Agricultural Research by Region Selected Years

Region	Expenditures in Millions of 1970 US Dollars			
	1951	1958	1965	1970
1. North America	225	333	448	478
2. Northern Europe	60	104	217	258
3. Southern Europe	8	15	27	32
4. Oceania, S. Africa and Rhodesia	25	45	100	176
5. Eastern Europe and U.S.S.R.	65	150	265	300
6. Latin America	8	11	24	42
7. Middle East and North Africa	19	26	38	47
8. South and Southeast Asia	10	16	42	54
9. East Asia	24	36	91	113
10. Sub-Sahara Africa	10	20	39	69
All Developed Countries	405	679	1126	1324
Less Developed Countries*	49	77	163	236
World Total	454	756	1289	1560

* Defined as regions 6 through 10 excluding Japan.

Source: Evenson op. cit.

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funds should be made available, and as argued in an earlier section of this chapter, investment in research has, in the long run, a higher rate of return than any other type of agricultural investment. Moreover, if the very substantial development of land and water resources envisaged in Chapter 3 were to be undertaken it would require a considerable additional research activity in support of those projects and a correspondingly considerable increase in research expenditures. Furthermore, bearing in mind that the population of the developing world is certain to continue to increase rapidly in the years after 1985, a continuing intensification and expansion of the research effort for food production will have to be sustained. This effort will comprise first the national research services of the developing countries, second, the international centres and third, research investment by developed countries for developing countries.

321. What should the developing countries have as an expenditure target for agricultural research in 1985? It is suggested that they should aim at increasing their research expenditure to 0.5 percent of GDP from agriculture compared with the level of 0.25 percent in 1970. If during this period of 15 years agricultural production in these countries were to grow at 4 percent per annum, which is the target for the Second Development Decade, then their research expenditure financed from their own national budgets should rise to a level of about $900 million per annum, calculated at constant 1970 prices, compared with an outlay estimated at $250 million in 1970. In the case of developing countries which are already spending more than the equivalent of 0.25 percent of agriculture GDP, it is suggested that their governments should aim at least for a threefold increase in real terms by 1985.

322. The expenditure of international centres which in 1970 was less than $10 million, has been increasing rapidly as a result of the creation of new centres and programmes and expansion of existing ones. As of now there are other centres already in the pipeline or under discussion, as well as several important projects which have not as yet been dealt with at all, but which have been identified in previous paragraphs. It is obviously difficult to estimate how many of these can become operational by 1985, but it is suggested that the target of expenditure on international research activities should involve an increase at least as great and probably greater than the increase postulated for the developing countries' own expenditure.

323. Reference must also be made to the developed countries' research expenditure in or on behalf of the developing countries. This in 1970 has been estimated at about $115 million and could perhaps rise to $200 or $250 million by 1985. This amount together with the Consultative Group's outlays would still represent a small fraction of world expenditure on agricultural research.

324. The final targets to be achieved by 1985 would add up to a total of more than $1.25 billion per annum for agricultural research (calculated at 1970 prices) in or on behalf of developing countries, or about three and a half times the expenditure level of 1970. In as much as the generation of new agricultural technology more appropriate to the needs, resources and social patterns of those countries is critical both to the objective of increasing food production, and to the rational management of resources for overall rural development, a concerted international effort to build up research capabilities in and on behalf of the less advanced countries and to focus them on priority goals is of the highest importance.

325. Recognizing the vital role that agricultural research in and for the developing countries will continue to play in the expansion of agricultural production, and expressing its concern at the inadequate amount of basic and adaptive research in certain fields, the World Food Conference may wish to:

(i) Affirm its conviction that the strengthening of agricultural research at national and international level must be accorded the priority merited by its vital role in providing new and improved tools for expanding food production.

(ii) Urge the governments of developing countries to examine the scope of their applied agricultural research programmes with a view to greatly enlarging the budgets for them and thus covering priority subject-fields more adequately.

(iii) Call upon the concerned institutions to intensify research on barley, triticale and other crops having nutritional importance without diminishing ongoing activities in other cereals; also to investigate problems connected with the opening up of new lands and with increasing the efficiency of water and fertilizer utilization.

(iv) Recommend that the resources of the Consultative Group on International Agricultural Research be substantially enlarged to enable it to augment the number and scope of international centres.

(v) Recommend that larger resources be devoted to the training of developing countries' manpower for research and related activities at the international centres and in the research institutes of developed countries.

(vi) Recommend that national and international expenditure on agricultural research in and for developing countries should be increased three-to-fourfold (in real terms) by 1985 to attain a level of at least US$ 1 000 to 2 000 million per annum.

B. Post-Harvest Technologies and Related Services

Storage and Marketing

326. In applying technology to crop and livestock production there are two tasks of approximately equal importance: the researching of new technology and the transfer to farms of the technology already known. In the field of storage and marketing, although research will always have a certain role, the predominant emphasis must be on trying to get the best-existing practices more generally adopted.

327. At various points in the preceding analysis mention has been made of storage deficiencies; this indeed probably constitutes the weakest link in the chain of distribution. Before it reaches the consumer produce has to be stored for varying periods in several places; on the farm, at some district assembly points, at a processing plant prior to treatment, at wholesale distribution centres and at the retailers. Cereals and other foodstuffs in defective storage become subject to mildews and fungus diseases; they are contaminated or consumed by rodents and insects. The resultant losses of food are estimated at 5 to 10 percent in cereals, though in exceptional cases as high as 20 to 40 percent; they quite usually reach 30 to 40 percent for perishable fruits and vegetables.

328. Losses in storage are not only quantitative but qualitative. Rodents and insects contaminate food grains with filth and excreta. Insects consume the most nutritious part of the grain. There is deterioration in its calorie, protein and vitamin contents. The protein efficiency ratio (PER) of insect infected wheat drops from 1.8 to 1.4 within 3 months and that of pulses from 2.2 to 1.8 in four weeks. Also damaged food grains absorb moisture and encourage growth of harmful micro-organisms. The infested grain suffers heavy loss during milling. Thus, grain legumes become powder during splitting and the flour yield from wheat is significantly lower and poorer in quality. These losses are higher in the case of soft grains.

329. These facts merit the according of high priority to the construction of effective storage facilities first and foremost for cereals, the basic foodstuff of the masses. And there is a further consideration, The proposals contained in the International Undertaking on World Food Security envisage the creation of national security stocks (chiefly cereals) on a much larger scale than has hitherto been customary except in a very few countries. Already a number of governments of developing countries have shown an interest in these proposals and have sought advice from the international agencies on the technical problems and the costs involved. The IBRD and the Regional Development Banks are prepared to assist in the financing of such storage facilities.

330. While security stocks would normally be held in large silos at ports or at other major distribution centres, there is also an urgent need

to improve on-farm storage and the stores at district collecting centres. The cost of grain storage bins for such purposes can be relatively modest. For livestock products, vegetables and fruit, the produce needs to be held in cold rooms and transported at cool temperatures. These facilities are expensive and can be introduced only gradually, starting with the areas having the highest concentration of production of these commodities. The organization of cold chains may in many instances attract private enterprise capital.

331. Turning next to all the activities other than storage (and processing), which are involved in passing food from the producer to the consumer, these marketing services tend to be taken for granted in developed countries, but often exhibit serious deficiencies in developing countries with the result that farmers' receipts from produce sales are less than they should be and that certain lines of production may be impossible, e.g. perishable fruits and vegetables where no rapid transport to market exists. Moreover, an effective marketing system should not only link sellers and buyers but should also stimulate the output of products and the consumption of foods.

332. In most developing countries where farming is in the hands of hundreds of thousands of mostly small-scale producers, the first link in the marketing chain is the purchase of inputs followed by the selling of agricultural products and their transfer to secondary markets, perhaps after some grading and/or packing. Generally these activities are in the hands of private enterprise middlemen, many of whom use their superior bargaining power and knowledge of market conditions to force disadvantageous prices on the farmers, especially as so often the farmers are already in debt to them. To remedy this situation, at least for commodities having an officially guaranteed price, many governments have established agencies with a number of local buying points where the farmer can take his product and obtain the official price for it. However, in some instances this advantage is nullified by the fact that, owing to bureaucratic procedures, he may not actually receive his payment until several months later. Many governments have also set up district and sub-district collecting centres, especially for perishables, where both the farmers and the small dealers can come to sell their produce and be assured of fair weighing, grading and pricing.

333. Commodities which are grown expressly for processing or for export, such as many oilseed crops, may be purchased by a Marketing Board which employs its own buyers, owns storage and sometimes operates a transport fleet. Other products for processing may be grown under contract for the firm operating the plant. In such circumstances governments have responsibilities for assisting farmers to get reasonable and fair terms of contracts.

334. In the reverse direction, i.e. the acquisition by farmers of inputs such as seeds, fertilizers and pesticides, shortcomings in marketing can spell the difference between success or failure in a particular season. The seeds may not arrive in time, the fertilizer may be the wrong mixture

or concentration, the pesticide may no longer be accompanied by the leaflet explaining its mode of use. Such failures constitute significant obstacles to the application of modern technology.

335. Returning to that part of the farm produce destined for sale in town and city markets, the margin between farm and consumer prices in developing countries, taking into account the low level of services rendered such as washing, grading and packaging, is usually considered to be high. Yet not every middleman becomes a millionaire. The difference can be traced to two principal causes: first, the produce is handled by an unnecessarily large number of people each of whom has to make a living out of his intervention, and secondly a rather high percentage of the produce is lost in transit partly because of transport delays and partly because of defective storage facilities.

336. If governments gave more urgent attention to reorganizing their urban food distribution systems, they could effect reductions in distribution costs of up to 20-25 percent, as the more successful experiments have shown. Particularly beneficial can be (a) handing over the responsibility for distribution to bodies, cooperatives or other, in which the farmer-producers themselves have a major stake and which therefore have an incentive to innovate and (b) the introduction of modern containers which better protect the produce from damage. In several countries the government operates "fair-price shops" (see Chapter) which have a restraining influence on excessive margins.

337. Whether marketing organizations are operated by cooperatives or by public agencies their success will depend largely on the ability of their staff. The techniques of marketing have to be learned like those of any other profession and yet in many countries the people in charge of markets and marketing agencies have had no previous experience or training. Through UNDP some governments have obtained technical and financial assistance in organizing training courses and seminars but much more activity in this field could bring major reductions in food distribution costs.

Agricultural Processing Industries

338. Within the strategy of agricultural development, processing industries are essential to perform a number of important tasks. In the first place, where they exist they extend the range of commodities which the farmer can produce; they can transform surpluses of perishables which would otherwise go to waste into storable products, e.g. tomatoes into paste, oranges into frozen juice. They also provide additional employment not only in the plants themselves but also in maintenance of the installations and in associated transport and can play an important role in area development; they diversify the range of products available to the consumer; when they produce for export they enable the country to earn more foreign exchange than if it exported the unprocessed commodity. In the present chapter attention will be drawn to only a few selected aspects of food

processing which directly influence the pattern of rural development and the nutritional status of consumers.

339. The cereal milling industry of many developing countries suffers from being equipped with antiquated machinery which occasions much wastage - too high a proportion of the output ending up as livestock feed - this is the case for example with rice mills in south-east Asia and with wheat mills in western Asia and the Near East. One solution to this problem lies in building large modern mills to which the milling business would be progressively transferred. However, most large mills come fully automated, operate round the clock and employ very little labour. To transport to them grain which has been grown over a wide area by small farmers is expensive and likewise the construction of the large silos necessary is also costly. By contrast, in the traditional system the farmer takes his grain in small quantities to the village mill from time to time, as occasion requires during the year. Most of the grain comes back to him for his family's consumption, the remainder going to nearby and town markets. Admittedly this system entails some physical inefficiencies, the equipment is in many cases under-utilized, processing efficiency is low, by-products are too small in quantity to find a ready market, yet the village mill provides employment and if it had ever kept accounts the cost of its plant would have been written off long since. Change will undoubtedly come, as population increases and the volume of cereal production expands, but little will be gained in this case by precipitating change for its own sake.

340. Quite different are the considerations which determine the pattern of processing in the sugar industry. In developing countries sugar cane has traditionally been a plantation crop and its processing has been in the hands either of the plantation owner, who might or might not be local, or of a foreign company. Moreover in sugar manufacture the economies of large-scale operations are considerable. Having regard to the current world shortage of sugar and the substantial increase in demand projected up to 1985 and beyond, very large extensions of cane growing are to be anticipated together with associated cane crushing and sugar manufacturing mills. It has been estimated that the amount of new investment required to construct the additional sugar manufacturing capacity needed to meet the 1980 volume of demand would be U.S.$ 2.5 billion (at 1972 prices) in the developing countries alone. This large amount will have to be obtained from many sources including foreign private capital, direct government investment or indirect government financing through loans to cane farmers cooperative organizations or similar bodies.

341. In other commodities, for instance oilseed crushing, instant tea and coffee manufacture, frozen fruit and juice production as well as dehydrated foods, the outlook is similarly for accelerated expansion in the years ahead. The capital investment requirements in these several industries will be considerable and the question of the extent of foreign participation will have to be considered case by case, bearing in mind the safeguarding of national economic independence.

342. But what may be an even greater preoccupation for the future social evolution of the developing countries and in particular of their rural communities is the influence which agricultural processing plants can have for bad or good in promoting the welfare of rural people. If the location of the new plants is decided upon solely from considerations of the plant's internal economic viability without regard to the interests of the local population, the results might in the long run be counter-productive for the enterprise itself and for the area in which it was situated. It is important to utilize these new plants as the spearhead of area development projects conceived to further in an integrated manner the social and economic progress of an entire district or region.

343. But if the agro-industries are to perform this function they need to be tied into the life of the district in as many ways as possible. Those which are processing materials supplied by farmers should arrange for those farmers to have a participating stake in the enterprise. Those which produce consumption goods should ensure that the local people have preferential opportunities for purchasing these goods. All should assume their share of responsibility for furthering the social and cultural life of the community. By adopting these and similar policies the management could succeed in breaking down the local people's incipient hostility, the opposition between "We" and "They", and could transform their industrial complex from being something resented into becoming something in which the community has pride.

344. The World Food Conference may wish to ask governments of developing countries to review their storage, marketing and processing facilities for food and agricultural products, and

(i) Urge them to accord high priority to achieving a substantial reduction in post-harvest losses especially by financing the construction of storage facilities, by encouraging agricultural processing industries and by improving the transport and distribution of foodstuffs.

(ii) Recommend that special attention be given to associating farmers' organizations in the marketing activity wherever possible, to the training of staff responsible for market and marketing agencies, to the modernization of containers, packaging materials and transport equipment and to improving the hygiene and efficiency of wholesale and retail markets.

(iii) Request the international financing agencies to give support to marketing projects, especially for storage, keeping in view each country's need to build up national security stocks of basic foods.

Chapter 6

Rural Development and Rural Poverty

345. In the preceding chapters, an attempt has been made to outline various measures to increase agricultural production in developing countries. These include proposals on agricultural inputs like fertilizers, pesticides, seeds and credit, the development of land and water resources and of livestock and fisheries, and on agricultural research and technologies. Even if these proposals were to be readily accepted and effectively implemented, there is no assurance that they will, by themselves, succeed in eliminating rural poverty, in resolving the problems of rural employment, or providing enough food to that one quarter of the population in developing countries that is really hungry and undernourished. In fact scores of examples can be cited to show that in the past two decades even a rapid growth in agricultural and industrial production has failed to resolve these problems; in some countries they have actually become more serious.

346. As already emphasized, the only viable long-term solution to the world food problem lies in increasing food production in developing countries. But unless this increase is achieved in a manner that involves the poorest segment of the rural population, that is, the small farmer and the landless worker, in the production and the employment process, they will remain poor and undernourished. Relief assistance of food aid can reach only some of them and for a limited time and is unlikely to provide a permanent solution.

347. The objective of doubling the output and consumption of food in developing countries over the next 15 years is not therefore merely a technical problem, which can be resolved only by applying the proper combination of technology, investments and inputs. The key element is the involvement of the people, particularly the underprivileged and the poorest among them, in the processes of economic and social development. Unless and until that is achieved, the technology, fertilizer or available water and other resources will not be utilized adequately or efficiently; the food that is produced will not be distributed equitably and the entire structure of the rural society will remain under the stresses emanating from growing unemployment and undiminished hunger.

Mobilizing People for Rural Development

348. How to involve people in the process of development, and how to improve the life of the small farmers and the landless workers, has perhaps emerged as the most critical unresolved issue in the search for more appropriate development strategies, but so far there is no clear-cut answer or solution.

349. Many countries have tried, with varying degrees of success, different kinds of solutions to these problems. They range from the Mexican Ejidos to the Chinese Communes and include the Israeli Kibbutz, Tanzania's Ujammas, Egyptian Agrarian Reform Institutions, Algeria's Self-Help programmes, different patterns of collective farming in various socialist countries and many other forms of cooperatives, or area development projects. There has also been a growing awareness of the need for agrarian reform and some attempts to introduce it in certain countries but with limited results so far.

350. There is no prospect or possibility that any single pattern or approach will be universally relevant or useful to all countries. Every country has its own political objectives, sociological attitudes and administrative capacities and will have to evolve its own approach to rural development to meet its particular needs and problems. But there are certain basic objectives or elements in rural development which would seem to be common and critical:

351. The first important starting point is the recognition that human resources are the most precious resource the developing countries have and it is the neglect of this resource that is the basic cause of their underemployment. A fuller development of this human potential therefore holds the key to the solution of the food problem.

352. Second, the task of utilizing the human resources more fully, or of mobilizing people for development is not a simple process which can be completed by creating a Ministry, writing a good chapter in a five-year plan, or setting up a few cooperatives for credit or marketing, or expanding educational facilities. It is a very complex long-term process entailing changes in patterns of ownership, political power structure, social traditions and attitudes, the organization of economic activity and the institutional and administrative set-up of each society.

353. Third, there really is no effective way to solve the problem of the small farmer until he ceases to be a small farmer by joining a bigger and a more viable unit, not as a hired worker but as an active member with a strong stake in its success. In practice, it is much easier to organize farmers into service cooperatives than into production cooperatives, except perhaps on new lands. But just as no one can expect a man in chains or with a heavy weight to run, it is futile to expect a sub-subsistence farmer with a small plot of land, under heavy debt and unable to feed himself and his family, to take three steps at once on his own and start using better seed, more fertilizer and new marketing techniques. In all probability he would go bankrupt, if he tried, and join the ranks of landless workers. Land reforms which break up big holdings into many small holdings do not solve the problem, unless they are followed by sustained efforts to assist the small farmers to organize themselves into viable institutions to reduce their handicaps, improve their land, control and manage their water resources better, receive and apply improved technology and arrange for essential agricultural services.

354. The fourth critical element in rural development is the capacity of a rural community to diversify and expand its activities from farming to forestry, fisheries, animal husbandry; to industries based on or serving agriculture, and to the provision of essential social and welfare services. It is this diversification of the rural economy and its growing capacity to generate additional incomes and employment opportunities in the non-agricultural sectors within the rural areas that conceal the true significance of the term "integrated rural development".

355. Finally, these stages in rural development cannot be traversed simply by multiplying the number of bureaucrats in rural areas to do things for the people rather than organize the people to do things for themselves. Rural development requires the creation of an effective administrative and institutional set-up at the local level to provide a two-way link with the political and administrative hierarchy.

356. There can be no unique pattern of social or institutional change for pursuing these objectives that is applicable to all countries. Each government will have to apply its own guidelines within the context of its own political and administrative systems to the whole range of issues and options, but one overriding criterion should be the impact of all plans, programmes and policies on the pace of rural development and the status of the underprivileged. For example, projects which make new lands available to large foreign or local companies for a rapid increase in production with the help of most modern machines and techniques may produce more food, but may not solve the problems of poverty or unemployment of the people in the region unless accompanied by special measures for them. Similarly, modern livestock projects which retain only a few people living on the project area may only complicate the food problem of the remaining persons even if the projects add significantly to GNP or exports.

357. On the positive side, specific policies would have to be adopted to encourage the growth of appropriate institutions and promote tasks related to rural development. These might include preferential interest rates and higher subsidies for cooperatives than for individual farmers and delegation of adequate administrative and financial powers to local institutions or communities to set up industries or undertake rural development projects.

358. Because of the complex nature and political sensitivity of the issues involved in rural development, international agencies and bilateral donors have to approach specific issues or projects in this area with great care. But they can and should play a constructive and positive role in supporting programmes of integrated rural development, once the basic decisions or initiatives have been taken by the national governments. These might include special programmes to benefit the rural poor through agrarian reforms, improved rural infrastructure, better access to credit and other public services, assured availability of water energy and other inputs, expanded extension services, formal and non-formal education and

training role of specific groups like women and youth. It is also essential to involve trained people in all levels of rural development and especially at the farm level. Much more effective use should be made of the mass media in close association with rural development programmes to keep people informed about new ideas and to promote a two-way flow of information.

359. International lending and assistance agencies should be prepared to modify their lending criteria and to expand their participation to support activities promoting the essential objectives of rural development. Where possible these agencies should earmark a share of their budgets to be used specifically in support of service to small farmers and other rural development programmes. At the same time, external financing of national projects should be dependent on the national adoption of appropriate policies for rural development.

Problems of Rural Employment

360. Policies and measures for promoting rural development must take account of the fact that no less than 75 percent of the population of developing countries live in rural areas. The majority depends on agriculture for a livelihood, but an important and growing minority depends on other rural occupations; and for development purposes the rural community has to be considered as a whole. To feed themselves and their families adequately, these people need productive occupation inside agriculture or outside, either as self-employed workers or as wage-earners.

361. Depending on the rate of drift of population to the cities, the developing countries' rural population may increase by between 500 million and 600 million between 1970 and 1985. Assuming that around one third of the population is or hopes to be in the labour force, it follows that duirng this period 170 to 200 million additional productive jobs have to come into existence. Moreover, the available rural work force is expected to continue rising in absolute numbers until well into the next century.

362. Even under the most optimistic assumptions about the future rates of industrializations and economic growth in the developing countries, the capacity for absorption into the non-agricultural sectors will remain fairly limited. Accordingly, the bulk of manpower in these countries will for years to come remain dependent on agriculture and allied occupations for a means of livelihood. In view of these predetermined factors, the rural sector - and in particular agriculture as the mainstay of the rural economy - will have to be enabled to play the largest possible part in raising the level of productive employment, particularly in the short and the medium terms.

363. In many countries, subsistence farmers are not the least privileged of the rural people. Landless labourers, even when salaried workers on commercial farms, usually earn uncertain and inadequate wages, and this only for a few weeks, or at best months, in the year. Rural development programmes must make provisions for offering steady employment opportunities

for this underprivileged category of rural dwellers. They could be engaged in small projects directly related to the necessary improvement of conditions of production in existing farms, or, if a cooperative system of production is chosen, constitute the labour force required for ancillary activities. Their standing must become comparable with that enjoyed by other members of the rural community. The International Labour Organization (ILO) in cooperation with FAO and other UN agencies has sponsored integrated rural development/employment promotion projects to demonstrate the possibility of better utilization of human resources in rural areas. Recently, the ILO has proposed a new programme for promotion of rural employment as an integral part of the World Employment Programme launched in 1969.

364. Because of the magnitude of the employment problem in the rural sector, development policies must have a clear employment focus. This proposition has several important implications. First, it provides an indication as to the orientation and emphasis of different programmes and projects aiming at the acceleration of agricultural development. Secondly, agricultural development programmes and projects need to be supported by action concerned with the simultaneous or successive development of the other sectors of the rural economy.

365. The major aim must be to achieve a realization among rural people of the extent to which they can attain self-reliance. In this context, the role of governments, though critical, must be catalytic and discreet. Flexibility to innovate or to change direction or scale is essential.

Conclusions and Recommendations

366. As already mentioned, there is no clear-cut pattern of rural development which can be suggested for universal adoption by all countries. The main focus of national and international action in the next few years should be to seek the maximum possible consensus on broad objectives and approaches, in the light of an objective assessment of the success or failure of various experiments. Within this consensus each country can thus chart its own course.

367. Recognizing the vital importance of mobilizing human resources for rural development and of involving the small farmers and other underprivileged groups in rural areas in increasing food production and in providing adequate food for the undernourished, the Conference should:

(i) Stress the paramount need for far-reaching socio-economic reform and institutional improvement in rural areas to organize and activate the rural population for integrated rural development and to eliminate exploitative patterns of land tenure and money-lending where they still prevail; and emphasize the role that can be played by agrarian reform and cooperative organizations in agricultural development and in generating greater self-reliance.

(ii) Call upon the international and bilateral agencies to review their criteria for financial and other assistance to rural development by placing increased emphasis on the involvement of people in all rural development activities and to expand their support to this field of work.

Chapter 7

Regional Strategies and Priorities

368. The theme of this chapter is to discuss the policy approaches to food production development within the frameworks of regional strategies. Governing all these strategies there are certain general considerations which have to be recognized.

(a) the need for a quick acceleration in the growth rate in the short run through programmes yielding immediate returns and/or having a short gestation;

(b) the need for increasing the productivity in the medium term through fuller utilization or exploitation of resources already in use, and concentration or completion of ongoing resource development programmes;

(c) the need for expanding the productivity base for agriculture in the longer term;

(d) the need for institutional and other changes in the organization of rural communities.

But while all these facets of food production policy have application in all regions, there remain special regional characteristics of policy formulation resulting from the distinctive circumstances of the region although, as will be noted, within any one region there may be countries whose circumstances do not conform to the regional pattern.

369. In a sense the regional groupings which have been consecrated are a geographical artificiality. None of the four has a common factor valid for all the nations of the region, even though in one region or another a particular language or religion may largely predominate. Certainly from the viewpoint of general development problems and of agricultural resources no regional uniformity can be found; instead there exist sharp contrasts between individual countries concerning their wealth, e.g. the special group of oil-exporting countries versus those without oil, or concerning their food/population problem i.e. their land/man ratios. In numerous other characteristics too one can note great divergencies among the countries of any one region. None the less, it is also a fact that the countries of each region have developed a habit of consulting together in intergovernmental meetings and of presenting when possible a common position; and out of these consultations already some degree of unity in policy orientations has been achieved. Therefore in the present chapter the strategy analysis is presented region by region while however noting the important differences of interest that characterize within each region particular sub-groups or even individual countries.

AFRICA

370. The underlying trends pose serious problems for the future. These trends relate to the population explosion which has yet to reach its peak, the very high rate of growth of urban population resulting in high rates of increase in urban food demand, the stagnation of the subsistence sector still partly nomadic and the considerable concentration of resources and productivity in the export crop sector so characteristic of "economic dualism".

371. The growing inability of the African continent to feed itself has been highlighted by the extensive droughts which have occurred over the past three years. Per capita food production, which has been on a downward trend for the past few years, in 1973 was 4 percent lower than in 1969, while cereal production has fallen by 16 percent. To make good the deficit, net imports of cereals have risen over the past 10 years from 1.6 million tons to 4.1 million tons. In per capita terms, an annual gross domestic cereal supply of 160 kg in 1961-63 had fallen to 145 kg ten years later, and in 1973 was down to 130 kg equivalent to a self-sufficiency ratio of only 76 percent.

372. Cereals constitute about half the total calories in the diets of developing countries South of the Sahara and a considerably higher proportion in North African diets. Socio-economic surveys indicate that in many African countries, the average calorie intake is 85 to 95 percent of estimated minimum daily requirements, while protein intake is seriously deficient in a number of countries.

373. Two cereals, wheat and rice, make up about three quarters of total cereal imports into the region: in 1972, 3.4 million tons of wheat and 0.8 million tons of rice. Wheat imports have increased in response to urban demand where wheat is progressively becoming the main staple. Its ready availability and competitive price has also favoured wheat consumption. It is realistic to expect that consumer preference for wheat will be maintained, and because of the continuing rapid increase in urbanization, imports may continue to rise at about 5 percent annually.

374. Because the possibilities of expanding wheat production are very limited, special programmes will be required to reorientate cereal consumption toward grains which can be produced locally. However, the fact that there are already some imports of maize, sorghum and millet indicates that overall cereal production capacity is under stress. There certainly is scope for raising output of these cereals as well as rice and, after meeting requirements, measures should be taken to make them more attractive to consumers in substitution for wheat. In addition to price policies and consumer education to dampen wheat demand, the technical possibilities have been established of producing flour substitutes (maize, sorghum, millet, peanuts and cassava flour) for bread making.

375. The food problem of Africa consists in securing an expansion of production to meet the demands of the home market. The export crops sector has long been well endowed with research, inputs and organization. The products required for the home market have been less researched and are produced mainly by farmers many of whom are still subsistence-oriented. The basic foodstuffs to be provided vary from district to district but chiefly comprise maize, sorghum, millet, wheat, rice, cassava and other roots; but urban demand for other foodstuffs is growing as incomes rise and will need to be met. Moreover, the patterns of food production need to be diversified in order also to improve the nutritional status of the rural people and to raise the level of farm incomes. Therefore, except in areas having special ecologies, African farmers will be moving increasingly toward mixed farming systems.

376. From the viewpoint of agricultural production potentialities and problems the African continent may be classified very broadly into four sub-regions:

(i) serious resource problems areas, including the Sahel countries and certain semi-arid areas in eastern and southern Africa;

(ii) areas subject to the disease constraints of onchocerciasis and trypanosomiasis;

(iii) tropical high rainfall areas with technical soil management problems, and

(iv) areas ecologically favourable for the production of cereals and other crops.

377. Fourteen African countries have 85 percent or more of their land in zones of low rainfall. There are usually in these countries other adverse conditions such as poor soils, difficult topography, distance to markets, extremes of heat. Also the rainfall is highly erratic, droughts for two or more years in succession being not infrequent. Much of the land is degraded range with low stock-carrying capacity; on the relatively limited areas of cropland cereals predominate. The agricultural potential of these zones will never be high but at present it is worse than it need be because of population pressure and poor husbandry practices.

378. The first need in this region is to exploit scientifically the available water supplies through dam construction (mostly small earth dams), tube wells and deep bores. At present much of the precious water goes to waste. The second step is to improve the pastures partly by introducing drought-resistant legumes into the grass mix and partly by adjusting the density of stocking. The third is to upgrade the adaptability and productivity of the livestock in the short-run through culling and in the longer term through research programmes designed to develop more suitable breeds. The work in progress at the institutes in Nairobi and in Addis Ababa should make important contributions.

379. Onchocerciasis control. Some of the best alluvial lands in West Africa are kept out of production because of onchocerciasis or river blindness. This disease is carried by the black fly (simulium damnosum) which breeds in rapidly flowing sections of rivers and now affects over a million people in the Volta River Basin covering nearly 700 000 square kilometres in seven West African countries. Debilization and blindness as a result of the disease prevent human settlement in the fertile valleys and inhibit development of the vast savannah belt of the Volta River area. Inability to utilize this area has been economically crippling for populations dependent on agriculture and cattle raising. The situation has been accentuated by the long drought in the Sahel and savannah which has gravely disrupted the already precarious socio-economic balance in the Upper Volta Basin and has added pressure on the population movement southward.

380. Studies and surveys, 1/ carried out by international agencies in collaboration with the governments of the countries concerned with coordination by UNDP, have provided the basis for a plan to tackle this problem. This would be based mainly on destruction of the vector and subsequent interruption of disease transmission. The total programme would cover an area of 654 000 square kilometres and affect 10 million people at a cost of $69 million up to 1985. The identified arable area potential is 1.2 million hectares but the cost of land development will be additional. It is planned to launch the programme in 1974 after endorsement by all concerned of the strategy proposed. The full programme will take a total of about 20 years and will cost around $120 million for which a special Onchocerciasis Fund is being established.

381. As Executive Agency, WHO will have technical responsibility for the programme in conjunction with the governments involved. The executive organ of the programme will be the Steering Committee for Onchocerciasis Control in the Volta River Basin representing the four sponsoring agencies (UNDP, FAO, IBRD and WHO) who, in addition, are also deeply involved in assisting the governments in agro-economic development activities in the programme area.

382. Trypanosomiasis control. The stage has now been reached, based on the experience already gained in various tse-tse clearing schemes and the clear need to make fuller use of the great potential of the infested areas, to contemplate large-scale control programmes. It is estimated that, if trypanosomiasis were brought under control, an area of about 700 million hectares with a good livestock potential would be suitable for livestock production and more productive mixed livestock and crop husbandry (see chapter 4). This would enable the cattle population to be increased by about 120 million head which could produce 1.5 million tons of beef annually.

1/ Onchocerciasis Control in the Volta River Basin Area. Report of the Preparatory Assistance Mission to the Government of Dahomey.

383. Whilst the occurrence of trypanosomiasis does not exclude settlement as is seen in the tropical rain forest areas of Africa, it does influence the willingness of people to move into tse-tse fly infected areas. This is partly because of the fear of the settlers themselves getting the disease, and also because they cannot keep cattle which are an important part of the ways of life for many potential settlers for these areas. Only very tentative estimates of the cost of such a programme are possible at this stage. It is envisaged that the programme would extend over a 40-year period: it would cost of the order of $2 500 million for tse-tse clearance and control; the cost of land development and settlement would be additional.

384. The tropical high rainfall areas to some extent overlap the disease-infested regions just described. They are characteristically covered with high forest or dense bush. When the tree cover is removed for the purpose of planting oil palm, rubber or flood rice the soil fertility can be maintained, but when clearance is total for cereals and other dryland food crops the soils leach easily and fertility rapidly declines. It will therefore be advisable to initiate research into what may be the optimum management of these soils, and meanwhile to proceed cautiously with the opening up of these zones.

385. Finally, there are the favourable agricultural areas occurring in many countries but often limited in extent. Some of the larger blocks are located in central and eastern Africa, in Ethiopia and the southern Sudan. In these areas most cereal crops can be grown successfully, as also sugar cane, oilseeds, industrial and forage crops. The problems are more of management than of technology, to augment the use of fertilizers and other inputs, to grow the varieties wanted by the market, to pay attention to weeding and other cultivation practices.

386. Turning now from the ecological characteristics of the main sub-regions to the social and economic structures prevailing in Africa, the typical social group especially in the rural areas has long been the tribe with its chief and its subordinate office-holders. In semi-arid districts where land productivity is extremely low the tribe has been nomadic, moving its flocks and herds to new pastures at fixed seasons; in higher rainfall districts when its numbers increase the tribe expands its living area into adjacent lands, if available, in permanent settlement. Cultivation and animal husbandry have been subsistence-oriented and few inputs used from outside the farm sector.

387. All this is changing. Population is increasing much more rapidly, there is a strong emigration to the towns and no more easily cultivable land remains available. The next steps such as forest clearing and disease conquest, which would enable more people to live, are beyond the resources of the tribe. That is why in many parts of the continent new settlement will have to be organized settlement with help from outside; it requires land survey, allotment and registration. It also requires the establishment of trial and demonstration farms, setting up or expansion of

organizations for extension and training, development of credit, input supply and marketing and transport.

388. This horizontal expansion of the food base coupled with the introduction of market-oriented production poses a problem and offers an opportunity. The problem is to find the most suitable organizational form for the holding of land and for the conduct of farming operations. Instead of the system of individual land ownership and operation along western lines it may prove more efficacious, especially where tribal unity remains strong, to retain that basic structure and establish farming cooperatives for cultivation, for marketing and for landholding thus securing the benefits of larger-scale units and avoiding any destruction of the customary social structure. In some areas it may also prove valuable to set up for trial and demonstration purpose a few well-equipped, large modern farms, parastatal or private, depending on government policy, to provide services and advice for surrounding farmers and farm cooperatives.

389. The main constraint in the medium term is posed by the non-availability of appropriate technology for the improvement of the traditional crops of Africa and for the transformation of subsistence agriculture. It should be remembered that rice and wheat are relative newcomers to the diet of the African people and while there are large low-lying areas in West Africa suitable for rice production and WARDA 1/ is attempting to adapt and improve the rice technology, rice will remain for some time a relatively small crop. As regards wheat the ecological conditions necessary for its cultivation are very limited in area. Under these conditions, the future food production increase would depend on the priority and outcome of the research programmes for developing high-yielding varieties of sorghum, millets, cassava, peanuts and pulses. Breakthroughs in these crops are likely to take time and cannot be foreseen to have any significant impact before the eighties. However they deserve priority attention from now. In the approach to such crop research, the environmental conditions found in different sub-regions have to be taken into account, such as the low rainfall, Sahelian environment and the difficult tropical soils conditions of the high rainfall forest belt. Equally important are problems of animal production and health to which little research effort has so far been directed. As mentioned earlier, the objective of such research should be to find a technology that can fit into the constraints and limitations from which the traditional farmers suffer in areas of difficult access and inadequate institutional development. The International Institute in Nigeria and the new livestock centres have indeed a challenging task before them. However, their efforts will not go far unless special measures are taken from now to develop and strengthen national systems of research. This is one of the critical areas requiring urgent attention if research results are to be available before 1985.

1/ West African Rice Development Association

390. But there is no need to wait. Many improved agronomic practices are already known. What is needed is an integrated area development approach with programmes covering specific areas in which a package of inputs are applied for particular cereal crops. (The basic inputs are good husbandry practices, irrigation, use of improved seed and chemical fertilizer application). Essential preconditions for the success are that a package of inputs can be put together which is suited to local ecological and socio-economic conditions, is simple and economically attractive and can be spread over a large area. An equally important precondition is an effective infrastructure of extension services, credit and market channels. A number of "package programmes" have already been launched such as those for maize in Kenya and Tanzania, for groundnuts and cotton in West African countries and the Minimum Package Programme in Ethiopia. The expansion of these schemes must be regarded as the basic approach to modernizing small-scale farming systems in the Africa Region. The aim could be to bring 20 million hectares under the package programmes.

391. The modernization of traditional subsistence farming will need a number of supporting policies and developments without which it will hardly make much progress. The most important af these are the receipt of incentive prices and the development of a reliable and non-exploitative storage and marketing system. In the recent past, low wheat prices have encouraged a fast growth of its consumption and imports. Consideration should now and in the future be given to realigning wheat prices with those of cereals that can be produced locally and finding ways of using locally produced mixtures of sorghum, millets, maize, roots and peanuts in bread making.

392. The different African countries have widely different resource endowments for crops, not only export crops but also among crops for the domestic markets. Most of them therefore find it advantageous to specialize at least to some extent rather than attempt to achieve total self-sufficiency in food supplies. There are important complementarities between some of these countries offering opportunities for the significant expansion of intraregional trade. Already some intergovernmental organizations have been established grouping some of the African countries for trade and other purposes with a view to creating preferential or tariff-free zones. The trade openings for food commodities could be more vigorously exploited and more should be done to establish coordinating machinery between the national agricultural planning authorities so that they can orient part of their production programmes toward the market requirements of neighbouring countries.

NEAR EAST

393. According to the projections based on the expected evolution of population and income, the Near East is expected to have a more rapid rate of growth of food demand than any other developing region, ranging from three to five percent per year according to country. Conscious of this trend, most of the governments in the region have established quite ambitious

agricultural plan targets, none of which envisage a rate of growth of output of less than five percent and many are set at seven percent or more. The plans aim at achieving self-sufficiency in as many agricultural commodities as possible, partly on grounds of national security, partly to reduce the cost of food imports and partly, where possible, to expand agricultural exports. Some of the larger countries plan to be self-sufficient in wheat and other cereals by 1985 and the smaller ones and those possessing the poorest agricultural resources aim at least for self-sufficiency in poultry-meat, eggs and vegetables.

394. However, over the past 10 to 15 years, the rate of growth of food production has averaged between zero and two percent per annum according to country. This performance can certainly be improved upon but it is doubtful whether even with the most energetic efforts the rate of expansion can be brought to match the rate of growth of demand. Even in Egypt where the application of modern technology has been pushed farthest the future possibilities are limited; already the entire wheat and rice area is sown to high-yielding varieties and already the entire remaining availability of Nile water is being directed to the New Lands. Therefore the scope for further increases in productivity per hectare is becoming smaller and there is no prospect at all of further increases in the cultivated area.

395. In the Near East, as in other developing regions, one encounters the usual constraints of insufficiency of trained personnel to convey to the farm population the existing technical knowledge and likewise the inability of the farmers to adopt the new practices, either as a result of lack of credit or of lack of motivation. But the constraint which dominates the Near East more than any other part of the world is the shortage of water. Indeed, apart from Egypt and the Southern Sudan, water has always constituted the limiting factor. The extreme examples of water shortage are the Gulf States and to a lesser extent Saudi Arabia whereas the water supply situation is somewhat better in the Lebanon and parts of Iran. In the non-irrigated areas the farm population which continues to increase rapidly in numbers is at the mercy of the extremely erratic rainfall which causes a total loss of crop several times in each decade.

396. The second major consideration in the Near East is the insufficiency of basic knowledge as to how the peculiar problems of the region might be solved. For a number of reasons, some historical and some accidental, the main directions of agricultural research have bypassed the needs of most of the Near Eastern countries. For example, there are as yet no high-yielding varieties of cereals adapted to the conditions of the rainfed areas. There are no legumes or improved grasses adapted to increasing the carrying capacity of the rangelands. There is very limited knowledge of the extent of groundwater supplies, there have been few studies of multiple cropping systems or of how to accomplish nomad settlement or of how to bring about consolidation of fragmented holdings.

397. Thus, in most parts of the Near East the agricultural advisers, although they can help farmers to introduce certain improvements in their cultivation and animal husbandry practices, cannot really as yet offer a technological package in any way comparable to that of the HYVs and fertilizers and irrigation water which was offered, for example, to the farmers in Pakistan and India. For this reason a major priority in the Near East is to increase the volume of adaptive agricultural research so that more attractive possibilities can be opened up for the farm people.

398. In a region such as the Near East where the majority of the countries are small either in area or population or resources or all three together there may be substantial advantage in inter-country cooperation for research and for investigating socio-economic problems many of which stretch across national boundaries. In some cases the cooperation could extend to all the countries of the region; in others to perhaps just two or three. For instance, proposals have recently been studied for setting up a Near East regional plant breeding centre which might specialize in crops such as barley which are particularly important to the region and which are not yet covered by programmes in other international centres. Likewise there may be justification because of the importance of horticulture in so many of the countries for establishing a regional horticultural centre to coordinate the breeding of improved seeds and root stocks and for distributing disease-free planting material. Again, because of the importance of rangeland management and of action to halt the encroachment of the desert, the work currently undertaken in the institutes at Cairo and Damascus should be extended to other countries of the region with provision for interchange of information and experience. It is also certain that much more research needs to be done on water resources and water use but much of this can be carried out through the national research systems. Nonetheless there are also inter-country problems, notably those of reaching agreement on the distribution of the water of international rivers that flow through two or more countries.

399. Except in the irrigated areas the productivity of farms and the incomes of farm people remain extremely low which is why a special strategy for the Near East must deal with the social and institutional structure of rural society. For instance, in several countries land reform measures have been undertaken and successfully completed but now need to be followed up with plot consolidation and with the revision where necessary of inheritance laws. In some of the countries plot consolidation is urgent not merely because of the small size of the plots but even more immediately because the present layout precludes terracing and the construction of irrigation ditches. Action must also be undertaken to help the bedouins and other nomads to improve their incomes without making still worse the overgrazing of the semi-desert rangelands. This may involve programmes for combining crop growing in one season of the year with pastoral nomadism in the other season or alternatively programmes for permanent settlement. For very few of these problems are the best solutions already known and most governments will wish to organize pilot projects utilizing alternative approaches. However, since the problems are quite similar from country to country, arrangements for exchange of information through the Council for Arab

Economic Unity, The Organization for Regional Cooperation and Development, and other such bodies should be made.

400. The improvement of the rangelands and the modernization of the husbandry of sheep and goats will involve major changes in the lives of the nomadic and semi-nomadic people in the relevant countries of the region. These people have their own way of life with their traditions, customs, attitudes and an innate sense of human dignity and pride. It would be most difficult to bring about in the short run changes in their attitudes and ways of living; but progress in this direction through pilot projects, demonstrations and social education especially to bring about changes in the attitude toward the use of common land and the keeping of livestock could be expedited through integrated programmes in the countries. The basic objective should be to bring about a clearer and stronger link between livestock raising on the ranges and their ultimate finishing, the development of improved marketing and transport for livestock and its products and an appropriate incentive price policy. These perhaps can be combined with what will be the most difficult task, namely to make the members of the family of the graziers accept a settled life within some reasonable zoning of the grazing areas. Attempts have been made in one or two countries to move in this direction and their lessons have been encouraging.

401. For the short and medium-term, greater emphasis deserves to be placed on improved utilization of the water resources already being exploited in existing schemes. For this purpose, four major programmes deserve priority. The first concerns reduction of water losses in the systems caused by seepages and field run-offs, and requires a programme for renovation of the existing distribution systems combined with extensive land levelling and improved methods of irrigation. The second programme which is parallel to this is for improved drainage and reduction or elimination of salinity which affects a large proportion of the irrigated area and results in a reduction of yields, in some cases even up to one half. This problem is particularly acute in the basins and delta areas of some of the major rivers such as the Nile, Tigris and Euphrates. Thirdly, all these will require institutional innovation and training to educate and enable farmers to make optimal use of available water. For this purpose water user associations or production units could be set up and better information on optimal methods of water use, including improved irrigation and crop husbandry methods, disseminated to the farmers. The range of such institutions varies among the countries and each country will have to develop its own system within its own political, social and cultural framework.

402. Production strategy should include a special place for irrigated fruit and vegetable production in many countries of the region because of the comparative advantage that they have. Increased production of fruits and vegetables will, on the one hand, help improve the share of these in the diet of the people in many countries and, on the other hand, enable the development of a larger export trade to some of the desert

countries in the Gulf area as well as to parts of Europe. The policy for increasing fruit and vegetable production, to be effective, should also include investments in, and development of transport, processing and marketing.

403. Attention needs also to be given to the place of fodder crops in improved rotations for irrigated land. The demand for milk and meat is increasing rapidly and at least some increase in their production could be achieved through the cultivation of higher yielding leguminous fodder crops on irrigated rotations. The scope for this would be apparent from the fact that in Egypt such fodder crops reach close to 20 percent of the irrigated harvest area against only 5 to 10 percent in other countries.

404. Special considerations apply to the Sudan which has numerous potentialities for increasing food and livestock production for domestic consumption as well as exports. FAO's Perspective Study on agricultural development of the Sudan has identified major programmes for the development of the livestock industry and expansion of agricultural production. These will involve the introduction of modern technology as well as the development of irrigation, transport and various services. These developments will significantly change the overall position of supply and demand in the region as a whole, especially in regard to meat. Developments on this scale would require a crash programme and considerable investments within the framework of a regional cooperation. The necessary institutions for such cooperation and investment exist, and should give priority attention to these programmes in the Sudan.

405. A distinguishing new feature in the Near East is the recently acquired wealth of the oil-exporting countries which means that for these countries the investment requirements of agricultural development can be easily met. For them the present bottleneck is not money but trained manpower. The new situation also provides opportunities for extending investment to other countries of the region through special regional organizations such as the Fund for Arab Economic Development and others.

406. Finally there are undoubtedly considerable unexploited opportunities for intraregional trade arising out of the complementarity which exists, to some extent at least, between the agricultural production patterns of the Near East countries. Building on the attempts hitherto made through the Arab Common Market and similar bodies to reduce or remove trade restrictions there are many possibilities of promoting increased regional trade. In some instances this may involve deliberately changing the variety of an export product to suit consumer tastes in particular markets, as for example the adaptation currently being made in part of the Egyptian rice export business to produce varieties acceptable to the peoples of the Gulf States. In other cases, notably for fresh fruit and vegetables, it will require concentration on improved grading and packaging and transport facilities. In these and other ways food production programmes can contribute to a closer economic integration between groups of countries within the Near East region.

FAR EAST

407. This region contains 70 percent of the developing world's population and in many of its countries the density of production per km2 is high. However, the annual rate of increase in population projected up to 1985 is less rapid than in other regions, namely 2.6 percent on average for market economy Asian countries and 1.6 percent on average for the centrally planned areas. In absolute terms the annual increase will remain impressive: an addition of some 60 million persons per year for the region as a whole in the early eighties.

408. Apart from Burma and Thailand the countries of the region are on balance food importers and the food deficits, at least of the market economy countries, are increasing because food production has been growing almost everywhere less rapidly than food demand. 1/ It is indeed some Far East countries which, together with some African countries, face the likelihood of the largest food import financing problems in 1985.

409. What are the prospects for agricultural improvement? In several of the countries most of the reasonably available land is already arable or in permanent crops, in India more than half the total land area. In a few, notably Indonesia where less than 10 percent of the land area is used for cultivation, the scope for horizontal expansion remains substantial.

410. These cases apart, the strategy for the technological transformation of agriculture must in this region be focussed on increasing land productivity rather than on increasing the amount of land in cultivation. What levels of productivity can be attained is demonstrated in Japan where the yields of the most important crop, rice, are over 5 tons (paddy) per hectare compared with around 1.7 tons in India and in Pakistan. Limited areas can be found in the Far East where improvement has been rapid in recent years but the overall average performance remains low, in spite of the advent of the Green Revolution to at least parts of some of the countries.

411. Land productivity can be increased partly by multiple cropping, i.e. growing a succession of crops each year off the same piece of land, and partly by increasing the amount harvested, i.e. the yield of each crop. The development of irrigation is one of the central elements of the programme strategy for both yield increase and multiple cropping. The urgent need and immediate priority attach to renovation, modernization and completion of the existing irrigation system. There is a tremendous scope for improvement in, and installation of the distribution system down to the field level, combined with land levelling and field drainage. In a number of irrigation systems major drainage and flood control works will also need to be undertaken if controlled irrigation and water availability for exploiting the potential of the high-yielding varieties of crops is to be fully exploited.

1/ The observations on the Far East in the following paragraphs, unless otherwise stated, relate solely to the market economy countries for lack of sufficient information concerning the others.

412. The medium and long-term strategy should include the development of new irrigation for which the region has considerable potential. Though 60 percent of the developing world's irrigated areas are in this region, it still has potential for more than doubling the irrigated area before reaching any limit. In the development of new irrigation, which for 15 million hectares is estimated to be feasible by 1985, attention deserves to be paid to all three hydrological potentials, namely surface water development in large schemes, minor irrigation including use of low-lift pumps, and groundwater development. The appropriate mix of these three types of irrigation development will depend on the resource position, relative costs and social benefits and irrigation development alternatives as they appear in different countries. In general, in view of their short gestation and greater flexibility, the minor schemes deserve to be given the highest priority in the short-term strategy whereas the large ones should figure in the medium and long-term.

413. In view of the considerable capital outlay on irrigation that the strategy calls for, it is important for each Government to ensure that the technology and construction methods are developed in line with the factor endowments in each country. Adoption of labour intensive construction methods can be further extended and streamlined, so as to provide employment to the large labour force in rural areas, and effect saving of the limited foreign exchange resources.

414. Another element in the strategy for increased yields and multiple cropping relates to the supply of basic inputs which go with the high-yielding varieties technology, especially fertilizers and pesticides. Assuming that adequate measures are taken to overcome the present world shortage of fertilizers and pesticides, very rapid growth in demand is anticipated in the Far East - a tripling of consumption in ten years. This, together with parallel expansion in the use of pesticides will not come about unless some rather radical reorganization is undertaken in the provision of farm credit. It is often said that the technological package of HYVs, fertilizers, pesticides and irrigation has reached only the larger-scale farmers, and to the extent that this is true it is largely because the small farmer has either no credit facilities or only those of the local moneylender; institutional credit has not reached him. Suggestions for remedying this deficiency have been put forward in Chapter 2.

415. The present situation of fertilizer shortage and the environmental and other considerations point to the need for urgent attention to an aspect of fertilizer policy that has so far been relatively neglected. This relates to economical and efficient use of fertilizers through better knowledge of the plant nutrient requirements in relation to specific soil and crop conditions, adaptation of agronomic practices, adjustment of fertilizer type to the environment, better placement and timing of fertilizer applications, reduction of fertilizer losses through weeds and development of fertilizer types which reduce leaching and fixation losses, besides reduction of transportation and storage losses. To achieve such economy and efficiency a range of activities will have to be undertaken by governments in the countries with appropriate priority, such as research and trials under different

local conditions, demonstration on farmers' fields and extension. The estimates of saving on fertilizers that could be effected through all these means vary but appear considerable.

416. The so-called slowing down of the Green Revolution in the countries of the region appears largely to be related to the fact that its success has been much more concentrated on wheat, particularly irrigated wheat, and not enough on rice and other crops. The HYV technology requires much further research and development and this should be reflected in research programmes and priorities in the international and national centres. The most important priority for such research relates to the rice crop which occupies 27 percent of the total harvested area of the most densely populated parts and is the predominant food grain of the people in the region. The wide range of ecological conditions under which it is grown has not been taken sufficiently into account in the varietal work. The varieties developed and released till now, require considerable plant protection, controlled water application and a high level of management. In the future, more attention could be given to the development of varieties which give yields at medium high levels, have a wider spectrum of resistance to pests and diseases and do not require a high level of management. Special attention needs to be given in this connection to the improvement of upland rice and deepwater rice which account for the bulk of the rice areas.

417. The other main cereals of the region, maize, sorghum and millet which are grown in the dry parts, are just beginning to receive attention and a new international institute for work on these has been set up in India, the International Centre for Research in Semi-Arid Tropics. The priority for work on these crops which suffer from greatest instability in production and correspondingly cause severe fluctuations in the income and food intake of the people, can hardly be overemphasized.

418. One of the more disturbing features of the trend of food production in the countries of this region relates to the stagnation of the production of pulses and oilseeds. The pulses in particular could be the major source of protein in the diets of the majority of the people but have hardly received any attention in the research programmes. Indeed, the spread of high-yielding varieties of rice and wheat has led to reduction in the area under pulses. Development and extension of appropriate crop rotations can result in increases in the production of pulses and also of oilseeds, even within the framework of available technology. In several of the countries a major expansion in cultivation of soybeans and other pulses could contribute more than any other single measure to improving the nutritional status of rural people.

419. The region and social disparities in a number of countries in this region derive in part from the lack of improvement of crops just mentioned and point to the need for giving greater focus in research to difficult environmental conditions. Unless this is done the strategy for increasing agricultural productivity in the dry regions and on small farms will not make much progress and social goals of equity will recive a set-back under the impact of HYV technology which so far has tended to favour the prosperous regions and the advantaged people.

420. The region contains a large animal population which mainly provides draught power, some meat and, in South Asia, milk. The bulk of the feed base comes from agricultural by-products and limited grazing lands of poor quality. Grain feeding is relatively low and, in total, accounts for around 11 percent of the cereals in the region. For the peoples of Far Eastern countries poultry and/or pig production offers important advantages. As emphasized in Chapter 4, these animals are the most economical converters of grain into meat and thus have a valuable role in countries where grain supplies are tight. They also can help diversify the diet of the families of small-scale farmers and other poor rural people. Further, the portion of the output which is marketed adds usefully to the cash income of the farm families.

421. Technical improvement in ruminant livestock will be slower and longer-term. In several countries a reduction in the number of unproductive animals would pave the way for an upgrading in herd quality. In some areas the breeds are not yet well adapted to high productivity in the local environment, often, however, due to poor nutrition. If rapid progress is to be made, the chief hope may lie in developing some new sources of feed concentrates. Already in one or two countries urea is beginning to be used on a considerable scale and probably not so far away is the next step of incorporating single cell protein into the feeding rations. However, until this or some other technical innovations become reality it is unlikely that the production of red meat will grow sufficiently fast to meet the increased demand expected in most of the countries.

422. For this reason, much greater attention needs to be given to increasing fish production both from the less exploited areas of the Indian and Indo-Pacific Oceans and from aquaculture. In several Far Eastern countries aquaculture is already known to rural communities; the practice of it brings useful employment and income and the product improves the nutrition of the rural areas as well as of the towns. Recommendations for the expansion of aquaculture contained in Chapter 4 have special relevance for the Far East because these varieties of fish are already well accepted by the consuming public.

423. In the Far East, just as in the other developing regions, there needs to be a strategy for the rural people themselves and for developing institutions which correspond to their needs. In an area as vast as the Far East, it is natural to find very many different types of social organization, many different cultures and very varying historical traditions. A few rural societies are flexible but many are deeply conservative. Some operate their activities on democratic lines, other observe a rigid class structure. Some are dominated by landlords and moneylenders. The social pattern of most of these societies inhibits rapid acceptance of new technologies because the introduction of them is seen as threatening the hierarchical basis of the local community. That is why a pre-condition of agricultural progress is to modify community attitudes in ways which make them more receptive to change. Several governments are making efforts to implement agrarian reform measures and to follow this up by establishing

organizations for assisting small farmers, for providing adequate credit and for extending non-formal education and training. Some are trying to bring together small farmers into larger groups for production purposes, and to carry out experiments in integrated rural development. Yet these efforts are too few and too small. In most of the countries of the region they do not as yet touch one tenth of 1 percent of the farming population.

424. There is, however, one outstanding exception, namely China, where a rather special approach has been adopted, where technology has been adapted to the people instead of trying to adapt the people to the technology. The Chinese have expected the rural communities to help themselves in modernizing agriculture, to create additional local employment outside farming and to build up the social services. Local agricultural production has been oriented not only to providing a supply of food to the cities but also, through concentration on certain products, notably soybeans and poultry, to raising the nutrition of the rural population to satisfactory levels without waiting for any major increase in rural purchasing power. In other countries these same objectives could be sought by a different combination of measures appropriate to the local circumstances. What is required is that these objectives be pursued with much more political zeal and seriousness so that the poorer sections of the people can organize themselves for bringing about a betterment of their life and living.

LATIN AMERICA

425. As a region Latin America possesses many peculiarities not shared by any of the three regions up till now discussed. Firstly, the great majority of its countries liberated themselves from colonialism more than one hundred and fifty years ago. Secondly, in most of them the average income per caput is notably higher than in other parts of the developing world (with the exception of the oil countries). Thirdly, the redistribution of the labour force has gone much further: in Latin America only 35 percent remains occupied in agriculture as against 61 percent in Asia and 71 percent in Africa. Fourthly, the productivity of the Latin American farm labour force is on average more than twice that of farm people in the other regions. Fifthly, subject to some important exceptions, the productivity of cultivated land is also on average higher.

426. This favourable spatial comparison can be supplemented by an equally favourable comparison of agricultural performance through time. For example, the cumulative annual rate of growth of food production from 1952 to 1972 was 6.1 percent in Venezuela, 5.4 percent in Ecuador, 5.3 percent in Mexico and 4.4 percent in Brazil. By comparison, few of the large countries in the other regions reached 4 percent and most were below 3 percent. A few Latin American countries, it is true, recorded extremely low rates, as did also some in the other regions. Thus, the general picture is one of a group of countries which have already made progress toward economic development and which possess, most of them, a dynamic agricultural sector.

427. Currently, the Latin American countries, with few exceptions, have high rates of growth of population, but the demographic evidence suggests that these rates have reached their peak (in contrast to Africa) and that in the years ahead some will begin to decline. The influence of the demographic factor varies enormously: from Brazil with its as yet unsettled open spaces to Haiti, one of the most densely populated countries in the world. Indeed, for some of the Caribbean islands the future would appear to lie more in inward tourism and outward migration than in agricultural development.

428. Because of the low population densities of many of the countries, Latin America is frequently portrayed as having vast resources of virgin land available for being brought into cultivation. This is to a considerable extent untrue. Some countries such as Argentina indeed have large uninhabited areas in the far South, but these would only support sheep and few people could be persuaded to live there. Each of the Andean countries has its Oriente and Brazil has its Amazonas; in all these areas considerable colonization efforts are being made and the potentialities for additional food production are great. On the other hand, though the land and water resources in these areas are abundant, the people require considerable inducement to settle in them. The one determination of every campesino's son is to go to the city.

429. Indications of the new land potential of Latin America, estimated at 85 million hectares, have already been given in Chapter 3; also intimations of some of the problems requiring research before the lands of the high-rainfall tropics can be cultivated on a continuing basis. While not all these problems can be expected to be resolved before 1985, it will certainly be necessary sooner or later to cultivate these tropics both to feed the people of Latin America and to export foodstuffs to other regions where at the end of the century the man/land ratio will be much less favourable.

430. At present, however, the preoccupations of Latin American governments are with two sets of problems: first, what might be called the commercial sub-sector of agricultural production and, second, the semi-subsistence low-income sector. As to the commercial sector, this is already much stronger in most parts of Latin America than it is in Africa or Asia. Much of the production of the principal crops and livestock products is in the hands of relatively large-scale farmers who operate their enterprises on business lines. Many of them are well informed as to recent advances in agricultural technology and many have lines of credit to commercial or semi-governmental banks. The extent to which this sector will continue a rapid rate of expansion during the next decade is somewhat uncertain. In some countries these farmers possess a strong motivation for expanding their scale of operations and arrange to do so either by intensifying production on their own lands or by acquiring additional farms where this is permitted under legislation. In other countries, the owners and operators of medium and large-size farms appear to be satisfied with their existing levels of income and show no eagerness to encounter new difficulties by trying to change their farming methods or the scope of their business. In some countries, for

instance in the Caribbean islands, the relatively poor physical resources inhibit much further expansion of production, and this is compounded with the difficulties of finding markets, mostly overseas, for new products or for larger quantities of traditional products.

431. A further constraint upon the expansion of the commercial farm sector is the weak propensity to invest in productive enterprises. In the great majority of Latin American countries the ratio investment to gross domestic product is extremely low relative to the levels of per caput national income, and an unduly high proportion of such investment as does take place is directed toward real estate. There have, of course, been expansions for certain commodities and at certain periods where market prospects were sufficiently promising to attract new capital investment, but it is certain that these instances are not sufficiently frequent. For example, at the present time a large volume of new investment is called for in the sugar industry, but on presently available evidence the implementation of investment plans in new sugar mills and related facilities is proceeding slowly.

432. There has been over the years much talk about the opportunities for intraregional trade in agricultural commodities, and one of the purposes of the Latin American Free Trade Association (LAFTA), as also of the smaller Common Market groupings, was precisely to encourage this type of exchange. In practice, although certain new trade flows have come into existence, the successes in the agricultural field have been rather limited. To a considerable extent the farm sectors of these countries are competitive rather than complementary (with the exception of the countries in the extreme south), which means that many of the countries seek to sell their export surpluses in North America and Europe rather than in neighbouring countries and similarly prefer to obtain from outside Latin America the foodstuffs which they lack.

433. Taken altogether, the strategy of governments for stimulating the commercial sector will comprise the usual group of programmes, many of which have been described in previous chapters. Perhaps the two things which would have the most stimulating effect would be the provision of easier access to new capital for investment in more modern equipment and, secondly, more attractive and more stable prices, both in domestic and in export markets.

434. However, from many points of view this commercial sector is not the one which should be receiving primary attention from governments. The human problems of Latin America's rural areas are concentrated in the non-commercial sector or, more accurately, the sector which tries but fails to be commercial because it is producing so little in excess of its own subsistence needs. The non-commercial sector is composed of different kinds of people including the ejidarios in Mexico, the owner occupiers of many farms in Central America and the Andes, and the landless rural people in all of the countries.

435. The general outlines of the strategy of rural mobilization and development have been sketched out in Chapter 6, but its particular application to Latin America encounters a number of difficulties characteristic of the region. For one thing, most of the countries are large and in each country an important proportion of the population resides in one or two extremely large cities. There are vast distances between these cities and small towns and between one small town and another; the intervening areas may be extremely sparsely populated. From this it follows that programmes of rural development encompassing the creation of rural industries with a minimum of infrastructure and social services are all extremely costly. Moreover, the rural industries themselves may have difficulty in becoming economically viable because their major markets are far away and transport costs high. In some cases attempts are being made to circumvent this difficulty by deliberately planning "poles of economic growth", namely, new industrial areas developed in or close to existing small towns, the hope being that these new centres of economic activity will act as a catalyst for employment and economic progress in the surrounding rural areas.

436. Another major programme concerns the structure of land holding which has still not been satisfactorily resolved in quite a few of the countries. Much has been written about agrarian reform and the Economic and Social Council of the United Nations as recently as July 1972 called once again for action when it urged governments "to consider agrarian reform as an important and integral part of national strategies for the attainment of the objectives of the Second United Nations Development Decade and to undertake, where required, vigorous measures to initiate and implement effective agrarian reform programmes" [ECOSOC Resolution 1707 (LIII)], but in Latin America as elsewhere the structure of land ownership is bound up intimately with the social structure of society, and agrarian reform legislation, while it can change land titles, does not of itself change social structures. Even after the lands of a particular community have been redistributed, the cultivators still look to the local leader whoever he may be for guidance, not only in their farming activities, but in many other things as well. This situation will persist until more democratic structures are built up preferably by the farmers themselves for their farming activities, for their marketing, for their purchase of agricultural inputs and for the general conduct of the affairs of the rural communities. In many of the countries, it is true, some individual experiments are being conducted and a few of these promise to be successful, but the efforts made up till now are disproportionately small compared with the size of the problem.

437. There is yet another issue concerning the disadvantaged rural people which is more urgent in Latin America than in the other developing regions. This relates to the question of income redistribution. In other parts of the world where only a very tiny percentage of the population enjoys affluence, any policies of income redistribution will do very little to alleviate the poverty of the lowest income groups. By contrast, in Latin America there are many countries where a sizable proportion of the population is well off, as can be seen readily in any of the major cities. This social phenomenon can on occasion incite unrest, it also fails to be a necessary

component of economic progress to the extent that the members of these income groups do not by their own efforts or by investment contribute to economic progress. These are very sensitive issues for very obvious reasons but they directly affect the welfare of the majority of the farm people who are the rural poor. At present the price policies toward agricultural commodities together with fiscal policies in the shape of consumption taxes and others are arranged in such a way that the rural people through forced savings make a substantial contribution to industrial development. It might be considered a reasonable objective of national policy to re-arrange matters so that the rural poor make a smaller contribution toward increasing the size of the national cake and simultaneously receive themselves rather larger slices than they have been given hitherto. This could be accomplished through a combination of measures in the fields of taxation and price fixing as well as through policies designed to stimulate employment where possible in rural areas, but at the very least in small towns.

438. It has been said, and with some truth, that it is the existence of such a large amount of rural poverty in Latin America which keeps the rate of growth of food demand rather low. Without doubt there is scope for income redistribution on a sufficient scale to increase very significantly the growth of food demand and thereby create more buoyant markets for domestic agricultural production.

439. Latin America, therefore, offers an unusual combination of opportunities and problems, both of which arise from the fact it has already achieved a certain amount of economic progress and from the existence of significantly large unutilized or under-utilized land and water resources. Many of the Latin American countries possess the technical know-how and equipment to tackle the tasks of land reclamation and settlement. Some of them also have sufficient financial resources of their own. Likewise, many Latin American countries have the economic know-how for tackling the problems of the disadvantaged majority living in rural areas, but are constrained in applying this know-how by a number of non-economic considerations. Yet experience has shown that economic growth cannot continue vigorously if food production stagnates. It has also shown that food production is liable to stagnate if governments continue to rely too exclusively on the performance of the commercial farm sector. Probably the untapped human resources, the mini farmers, the landless labourers, the under- and unemployed in rural areas constitute a much greater food production potential than the virgin forests of the Amazonas. Probably the development of this human potential is the most pressing task which confronts the governments of the Latin American region.

Chapter 8

Requirements of Financial Resources

440. The proposals considered in the preceding chapters are addressed to different authorities and bodies, both national and international, depending on the nature of the action envisaged. Several proposals call for action on the part of governments in developing countries. This is so because in the final analysis, an essential prerequisite for the effective and successful implementation of a large number of these proposals is the readiness and willingness of governments concerned to commit themselves to the suggested action programmes, and to review and, where necessary, modify the priorities, policies and plans and to mobilize the resources required.

441. These national actions would need to be effectively and adequately supported by international efforts to channel the requisite resources and technical know-how needed from abroad. The governments of the developed or other potential aid-giving countries as well as the international organizations concerned have a crucial role to play in maximizing the impact of actions of individual developing countries in accelerating food production and improving nutrition. Often in the past, the lack of adequate commitment of resources has been a major constraint in implementing the resolutions agreed in international fora for mounting a concerted attack on the world food problem. This must not be allowed to happen again. While a considerable part of the resources has to be mobilized through national efforts, the role of international assistance, both bilateral and multilateral, is indeed crucial. External aid by providing critical amounts of essential inputs and technology can have a salutary effect in activating domestic resources which might otherwise remain unexploited.

442. The existing flow of external assistance, both bilateral and multilateral, for programmes of agricultural development in developing countries is admittedly inadequate. The present levels of official development assistance from multilateral and bilateral resources to agricultural projects in terms of commitments runs at about US$ 1.5 billion per year excluding assistance from socialist countries. The largest component of such assistance comes from the World Bank (over 60 percent). According to available information, direct bilateral assistance from 16 aid donors which are members of the Development Assistance Committee of the OECD for capital investment in agriculture has been less than US$ 300 million a year (US$ 286 million in 1971 and US$ 246 million in 1972 which was only 3.5 and 2.7 percent of the total project assistance by these countries). These flows would need to be multiplied several times to achieve the desired rate of increase in food production of the developing countries.

443. There is no easy and readily acceptable method of estimating total financial requirements for agricultural development in developing countries. FAO's Indicative World Plan for Agriculture completed in 1969 did however present the only comprehensive estimates of specific investment

requirements in various sub-sectors, like land and irrigation, equipment, livestock, fisheries, forestry, together with financial requirements for current inputs like seed, fertilizers and pesticides. These added up to total cumulative investment requirements of US$ 112.5 billion (in 1962 prices) for the period 1962 to 1985 for 64 countries, producing 85 percent of the agricultural GDP of developing countries. The financial requirements for current inputs were estimated to increase from an annual outlay of US$ 8.4 billion in 1962 to US$ 26 billion in 1985.

444. Another attempt has now been made to quantify on the basis of the IWP estimates the investment requirements of specific programmes recommended in Chapters 2-5 of this document. These add up to a total of US$ 120 billion for the 11-year period from 1975 to 1985 in 1972 prices, or an average investment of US$ 11 billion per year. Since these estimates do not include the entire range of investment activities for agriculture, and allowing for the considerable increase in prices since 1962, they are largely in line with the IWP estimates. A great deal of further work is necessary to make accurate and reliable estimates of investment requirements in agriculture and the present and required flow of external resources but the following general observations could be made on the basis of available information to indicate the broad orders of magnitude:

(a) The total annual rate of investment in agriculture in developing countries must be stepped up from the current level of US$ 8-10 billion to a range of US$ 16-18 billion over the next five years (1975-80), including about US$ 11-12 billion for activities identified in this document. The total investment proposed would represent about 9-10 percent of agricultural GDP during this period. Acceleration of this order would seem necessary to increase the annual rate of agricultural production from an average of 2.6 percent in the past twelve years to about 3.5 to 4 percent in the next twelve years.

(b) At least one third of these investment requirements would have to come from outside, i.e. about US$ 5-6 billion annually in the period 1975-80. It is widely recognized that the present level of external financing of agriculture, which is no more than 10-12 percent, is very inadequate. The actual requirements of external financing would vary from sector to sector and should include, in addition to the foreign exchange component, a proportion of local currency expenditures on the lines of financing provided by the World Bank for certain projects.

(c) The phasing of different programmes would depend on the nature of the programmes but estimates for the next five years have been prepared keeping in mind the need to invest in the short run on activities yielding immediate returns, and the constraints imposed by current absorptive capacity.

445. The most critical factors in the implementation of specific programmes and indeed in the efforts to increase food production in developing countries would thus hinge on the possibility of increasing the annual flow of external resources from the current level of US$ 1.5 billion to an average of US$ 5 billion in the next five years, in terms of commitments.

446. As explained in Chapter 3, land and water development would require external support of about US$ 2.5 billion annually, including renovation and improvement of existing irrigated areas, equipping new land for irrigation and opening of new arable land. Much of this would go to Asia and the Middle East where the immediate priority is renovation and improvement of existing irrigation systems to increase yields and cropping intensity and thereafter expansion of new irrigation. A beginning can also be made for the development of new land, particularly in Africa and Latin America. The proposed external financing of US$ 2.5 billion would help to push up total investment in this important sector to about US$ 7-8 billion per annum by 1980.

447. Crop and meat development programmes including programmes for the development of seed industries, building up livestock inventories, tse-tse fly control in Africa, pig and poultry production facilities and livestock processing industries like milk and meat plants will require another US$ 1 billion per annum.

448. To expand total investment in national, regional and international agricultural research to the level required to build up the technological base for improving productivity would require external financing of about US$ 600 million annually, about half the total estimated cost. This would include research and training facilities in developing and developed countries and expansion of research activities in international agricultural research centres.

449. External support for credit programmes for farmers, particularly the small producers and for marketing, storage and processing facilities would involve about US$ 1.2 billion, including annual investments of US$ 200 million to revolving credit funds for expansion of credit for current inputs.

450. External financial resources required for the construction of fertilizer plants in less developed countries are not included in these specific requirements of agricultural investment, since these are normally shown in the industrial sector. But, as mentioned in Chapter 2, it would be necessary to invest about US$ 6 500 million by 1977-78, to fill the likely gap in production capacity up to 1980-81. The bulk of this investment is, however, likely to be in oil-producing countries which would have the financial resources required. About 20 percent of the investment would, however, be needed in other developing countries and would have to be financed from external sources. In addition, other fertilizer-importing countries would require assistance of US$ 500 million a year in the next five years for meeting the high cost of their growing fertilizer requirements.

451. These estimates also exclude large requirements of industrial investment for processing agricultural raw materials. For example, as mentioned in Chapter 5, total new investment required to construct additional sugar manufacturing capacity alone to meet the 1980 demand for sugar in developing countries would be US$ 2.5 billion (at 1972 prices). A significant part of the investment required for agro-industries, as indeed for some of the specific agricultural programmes proposed here, could conceivably be provided by private sources, depending on national policy in the country concerned. The potential role of private foreign investment in providing capital, technical know-how and managerial skills in meeting the agricultural and food objectives of the future could be considerable, provided a framework of policies and responsibilities can be evolved which is acceptable and satisfies the interests of both sides.

452. The proposed expansion in agricultural investment will require a corresponding increase in technical assistance, not only for feasibility studies and project preparation but also for basic studies, backstopping activities and training programmes. For an interim period of several years, much effort will have to be directed to this end to build up the capacity of developing nations to absorb investment effectively. A substantial training drive, over a wide range of disciplines and activities, supported massively by both national and international institutions and geared to the priorities and specific economic and social objectives of individual countries should be a vital component.

453. Without great new initiatives to increase external funding, the amounts of such funds will fall far short of requirements. Despite significant shifts in priorities to agriculture and to small farmers, the World Bank resources foreseen for allocation to agriculture, while they are expected to double in real terms in the next five years, are not likely to exceed US$ 2 billion annually. Other multilateral agencies and bilateral donors, given present indications, may increase their financing of agricultural programmes to about US$ 700 to US$ 750 million. There is thus need to mobilize an additional amount of US$ 2 to US$ 2.5 billion annually for achieving the suggested targets of food production in developing countries. The proposal to create an Agricultural Development Fund as outlined in Chapter 20 could greatly facilitate the mobilization of these resources.

454. Since the crux of the food problem and the major need for assistance is in countries with very low per capita income and limited foreign exchange resources, concessional and grant funds will have to make up a significant part of the additional funds. It should be noted, however, that the proposed additions to costs of assistance for agricultural development would be only a small fraction of costs that would otherwise be involved in meeting the projected food deficits in future. As mentioned in Chapter 1, in the absence of larger investment and effective action to achieve a faster rate of growth in food production, the total cereals gap in developing countries could be as high as 85 million tons by 1985. (The projected meat gap could also involve a considerable additional cost). Such a gap if allowed to develop, could involve an annual foreign exchange outlay of US$ 14 to

to US$ 16 billion per year (at mid-1974 grain prices) but most of the developing countries would not have the resources to finance imports on that scale.

455. In the light of these considerations, the World Food Conference may wish to:

(i) Express concern at the inadequacy of the present level of development assistance flowing to agriculture in the developing countries; and emphasize the urgent need for raising the commitment level of such assistance from the current level of US$ 1.5 billion to at least US$ 5 billion during the next years (1975-80) to meet the food production goals in developing countries.

(ii) Consider ways and means of mobilizing the additional resources required to meet this large gap in external financing requirements including the possibility of new institutional arrangements to facilitate this task.

(iii) Urge developed countries to substantially increase their bilateral official development assistance to agriculture, keeping in view the needs of capital assistance, technical assistance, as well as programme loans for imports of fertilizers.

(iv) Urge the World Bank, IDA, Regional Banks, UNDP and other agencies to continue to attach appropriate priority to the needs of agriculture in developing countries in their financing programmes for the future.

Section II

POLICIES AND PROGRAMMES FOR IMPROVING NUTRITION

Chapter 9

National Food and Nutrition Policies

456. Improvement of the nutritional situation in the world involves not only food production, distribution and utilization but also establishment of appropriate policies and priorities taking account of the nutritional consideration. The food and nutrition system is a long and complex chain, starting in the land or sea, and ending in each human body. Although some developed countries have a nutrition problem arising from excessive food intake, for a vast majority of the poorer populations the problem is the sheer lack of sufficient food. Sometimes, however, the food eaten does not contain enough nutrients, or these are present in forms that are not biologically available. In this context, the genetic improvement of the seeds, particularly of staple foods, to provide higher yields of more nutritious crops could in the long run prove to be a very important means to improve the nutritional situation. In many cases, the lack of food is aggravated by infections and other illnesses which affect the proper utilization of the nutrients. In industrialized countries and in the economically privileged minorities of the less developed nations, the problem of overconsumption should be considered, because it leads to physical deterioration and certain degenerative diseases, and is also generally coexistent with large food wastage.

457. In most of the developed and developing countries, for social or political reasons, different types of intervention programmes have been implemented with a view to protecting the nutritional status of the population and of curing and rehabilitating the malnourished. These actions have been generally oriented only within one field, such as education or health, or else they have been purely nutritional in scope, such as supplementary feeding programmes or fortification of foods. It should be remembered, however, that inadequate food consumption and malnutrition are closely associated with poverty, the most obvious reason being, as explained in the Assessment, the inability of the poor to produce or purchase the food that they require. Efforts to improve the food and nutrition situation will, therefore, have to be visualized as an integral part of solving the complex problem of poverty through socio-economic development and better income distribution. It is evident that action programmes must form part of a single and comprehensive strategic approach embodied in a food and nutrition policy, whose objectives should be accorded high priority in national plans for socio-economic development. A food and nutrition policy can be defined as being a complex of educational, economic, technical and legislative measures designed to reconcile at a level judged feasible by the planner, projected food demand, forecast food supply and nutritional requirements. These measures are not only of economic but also of social import. They are directed at remedying distortions detrimental to the public interest between what the consumer desires, what he can obtain and what he needs physiologically.

458. As indicated in the Assessment, nutritional deficiencies in most of the developing countries are directly and principally the result of widespread poverty. A massive and concerted attack is called for on the causes of poverty if, in the long run, the problem of inadequate nutrition is to be eliminated. However, it is neither necessary nor desirable to wait until the process of economic development has brought about a general increase in incomes. Action, as will be seen, can be taken in the short term to increase the food production capacity, the purchasing power and/or the nutritional status of the least advantaged people in each country. The purpose of a food and nutrition policy is to devise the appropriate measures as part of the national development programme.

459. A first step in most developing countries is to obtain more accurate information as to the numbers of people nutritionally at risk in different parts of the country and in the different socio-economic groups. Statistics on mortality and morbidity need to be broken down in this way, clinical and anthropometric tests of identified population groups need to be undertaken and their results periodically verified, food consumption and household budget surveys need to be conducted. But, because all this takes time and may be expensive, specific sample surveys could be carried out as a first step, to obtain indications of the situation in different areas and social groups. Universities and voluntary organizations could assist in this work. Only by such means can the scope and nature of the problems be delineated enabling the formulation of programmes which do not waste scarce resources by covering people who are not in real need.

460. Both for analytical and action purposes it is convenient to examine the rural poor separately from the urban poor. As regards the rural poor, composed mainly of small and subsistence farmers and landless labourers, the problem of improving their food consumption is linked with that of increasing their food production and their incomes. In order to meet their nutritional needs and improve their pattern of food consumption, and create a surplus for the market, the small and subsistence farmers will require additional amounts of material resources - land, water, capital and inputs - plus the know-how and the organization to make better use of such resources. For the large group of landless labourers, perhaps the poorest among the rural population, the solution will be mainly found in the creation of additional employment opportunities, through such programmes as rural public works (roads, irrigation works, electrification, communal buildings, housing, etc.), the establishment of agro-industries in the rural areas, and the improvement of the marketing system. The change in production patterns following agrarian reform may also have an important beneficial effect on rural employment, making the employment profile more stable and regular throughout the year and thus eliminating or reducing the "slack seasons", when a large proportion of the landless labour force remains idle and, hence, without income. The solution of the nutritional and the employment problems of large groups is intertwined in many developing countries with changes in the pattern of rural development, that cannot be effected without deep transformation in the structure of land tenure, in the structure of the institutions that provide financial, economic and

technical facilities and services, in the organization of the rural population and in the administrative structures, from the local to the national level. The policies and measures needed to change agrarian structures and promote integrated rural development (described in Chapter 6 of this document) will do much to increase purchasing power and thus the nutritional status of the rural poor. Food aid, bilateral and multilateral, tied to projects may be necessary.

461. As to the urban poor, the main issue is to provide them with more employment opportunities and better levels of wages and salaries even when larger food supplies are available in the market. The patterns of industrialization have a large bearing on the rate at which the incoming rural population can be absorbed productively. It appears essential to introduce substantial changes in the pattern of future industrial development, creating new labour-intensive industries, and opening additional employment opportunities through more emphasis on labour-intensive methods of construction and production. Such developments, together with a progressive improvement in the real wages of urban workers, would make possible a significant increase in the food consumption of the poorer families. Purchasing power can also be increased by raising the technical skills of workers through training programmes. However, in order to have a real impact on purchasing power, such programmes should be considerably expanded and diversified.

462. Since in many cases a part of the peri-urban population is still complementing its diet with home produced foods, urbanization should be accompanied by the provision of individual kitchen gardens and the development of green belts not far away from the cities. Furthermore, for the urban population, as well as for that part of the rural population that has to buy all or part of their food, a mere increase in income may not be sufficient to ensure a proportional increase in food consumption (both quantitative and qualitative) if it is not accompanied by adequate measures to improve the marketing system.

463. With respect to marketing, there is need for general improvement of prevailing systems and practices in most developing countries. Ways have to be found to ensure that retail food prices do not increase abnormally following any increase in the purchasing power of the poorer groups. At present, marketing structures in the majority of the developing countries are characterized, inter alia, by the lack of adequate retail facilities where the poorer segments of the population can acquire their food at reasonable prices and in adequate conditions of quality and hygiene. Since these groups have very low incomes and no facilities at home to preserve their food, they usually buy their foodstuffs in minimal quantities at high prices from the myriad of peddlers and small shops.

464. One solution to this problem may lie in the establishment of governmental "fair-price" shops, of the type that are operating in India and some Latin American countries, where prices, quality and hygienic condi-

tions of the foodstuffs can be guaranteed. These shops (where non-food essential products could be also sold) should be located in places where low-income population density is higher, such as the slum belts surrounding big cities in many developing countries or could be itinerant in order to reach the rural market places and remote villages. It should, however, be recognized that the effective functioning of the fair price shops depends to a large extent on the successful solution of the administrative constraints, problems of procurement and impact on consumer demand in case of a wide divergence between fair price shop and open market prices.

465. Such enterprises could well associate with small farmers' cooperatives, thus providing a secure outlet for their agricultural production, at better prices for both producers and consumers, if necessary through injection of subsidies to benefit both groups. Furthermore, they might also induce a larger involvement of the community, both in the operation of the shops and in the construction of the physical facilities required. It is essential, however, to have suitable managerial staff, for which special training is required.

466. A food and nutrition policy would contain most or all of the components mentioned above, but it should do more. It should in each country set a specific target to be obtained within a specific time-period. To take a simple example, if it had been revealed that the poorest 20 percent of the population had an average per caput intake of 1 500 calories per day whereas the next 20 percent had an average intake of 1 900 calories, the target might be to raise the average consumption of the first group to 1 900 calories within a period of say seven years. Other targets for specific vulnerable groups and for eradication of specific nutritional deficiencies will be suggested in the following chapters.

467. In the last decade numerous international conferences and seminars have called the attention to the need for countries to establish food and nutrition policies. But, it has to be recognized that very few countries have as yet successfully formulated, let alone implemented such a policy. Evidently, a more dynamic approach is needed if significant results are to be achieved within a reasonable period. Governments which accept this need may wish to request the aid of task forces to advise on the process of planning and implementing food and nutrition policies. This assistance might contain the following elements: (a) motivation of policy makers, including agricultural policy makers, to adopt food and nutrition as objectives in national development planning; (b) compilation and analysis of already existing information and the collection of supplementary data; (c) formulation of the food and nutrition policy and its integration into the national plans for socio-economic development; (d) implementation, evaluation and, where needed, reformulation of policies and programmes. Paramount to the success of the task forces is the creation of a suitable administrative and planning structure which is consistent with the inter-disciplinary, intersectorial and interministerial nature of food and nutrition planning.

468. It is suggested that the World Food Conference might:

(i) Recommend to governments that plans for socio-economic development specifically include a food and nutrition policy which strengthens and reconciles sectoral plans, policies and programmes to produce maximum benefits for the nutritional status of the population.

(ii) Urge that in each country steps be taken to locate and quantify the extent of malnutrition in the various socio-economic groups as a basis for the formulation of action programmes;

(iii) Suggest that each government should set up specific targets for improving the nutritional status of disadvantaged categories of population within a specific time period;

(iv) Recommend that national food and nutrition policies should include strategies for reducing undernourishment both in rural and in urban areas and that the international agencies concerned widen and strengthen their assistance for this purpose.

Chapter 10

Special Feeding Programmes

469. The most important way to give immediate nutritional help to the most needy groups of people continues to be feeding programmes. Although the main purpose of feeding programmes is to promote a better nutritional status and to protect against the risk of malnutrition, important indirect benefits can be obtained from the large funds and considerable deployment of resources that these programmes demand.

470. First, feeding programmes, when carried out efficiently and over a long enough period, can ensure a minimum level of nutrition to those in the vulnerable groups, and those who cannot afford to cover their needs through market channels. They also have the effect of increasing the productivity of workers. These programmes can also create a stable demand for commodities which can eventually be advantageously produced in quantities much larger than the commercial market will allow. The changes in food habits introduced with these programmes is a medium-term objective of the utmost importance in planning agricultural, food industries and fisheries policies directed to the production of new foods or increasing the exploitation of under-utilized resources.

471. Second, well-adapted feeding programmes can help to improve health and education services in many developing countries. In schools, the rate of drop-outs and absenteeism is considerable and has been shown to be significantly decreased with school feeding programmes. In the hospitals, if the number of malnourished children needing treatment could be diminished, there would be more space for other categories of patients. Supplementary feeding programmes that lead to improvement of the nutritional status of children, particularly during their first three to five years of life, will certainly pay high dividends in the reduction of morbidity and mortality rates, in reducing social welfare costs and in making medical assistance more effective.

472. The potentially negative aspects of feeding programmes, as they are often presently conducted, should not be underestimated. First, the experience accumulated during the last 20 to 30 years tends to indicate that, in general, the coverage achieved so far is too limited, in many instances not more than 2 percent of the target group, involving a wastage of resources and efforts.

473. Second, the programmes based on imported foods, if not carefully designed, can have deleterious effects on the local production of food, introducing food habits that are undesirable in the long run because they cannot be satisfied from national production. Thus they may disrupt commercial structures, produce negative effects on the balance of payments or lead to dependence on a donor country.

474. Third, feeding programmes can have harmful consequences if they are suddenly and prematurely discontinued. There is strong evidence indicating a high incidence of relapse of treated malnutrition when such persons, especially children, return to living conditions characterized by extremely deficient sanitation, a high risk of infectious diseases, a low level of mothers' education, and inadequate family income. Because of the close association between undernutrition and infection, feeding programmes directed to improve the nutritional status of children will have a larger effect when coupled with measures that will improve the sanitary conditions of the environment (safe drinking water, disposal of excreta and garbage), increase the resistence to infections through immunizations and provide treatment for chronic parasitosis and infectious diseases.

475. Fourth, some common failures of feeding programmes relate to inadequacies in planning and administration. Some of the programmes represent a very large investment and it is surprising that in spite of their sometimes huge cost, relatively little attention is given to the technical and administrative considerations that are the key to their success. It must be acknowledged that the inadequate standard of technical personnel in many countries that are the most in need of group feeding programmes, is a serious drawback. The United Nations agencies could give technical help in these matters, lending direct advice in the formulation of programmes and taking a greater role in the training of the needed personnel at every level. This has special relevance to programmes which are aimed at pre-school children and lactating mothers, the vulnerable groups which from an administrative point of view are the most difficult to reach, since they are so widely scattered in their homes.

476. Although the choice of foods to be used in a feeding programme will depend on the specific situation, certain guidelines can be given. The contribution that the meals received or the supplement given makes to the daily energy and nutrient needs should be significant and the costs per unit of protein and energy remain at a minimum compatible with good acceptability. Quite obviously, the products to be used should have good storing properties, they must be easy to handle and require little or no preparation before actual use. When the items are imported or secured through international aid - such as CSB (corn soy blend) and WSB (wheat soy blend) - the possibility of their future manufacture within the country, in the required quantities at competitive market prices, should be considered. Also the acceptability of some products, especially those obtained through donation, must be properly studied and if necessary their incorporation into local culinary recipes should be thoroughly investigated.

477. The development, manufacturing and marketing of supplementary food mixtures for infants and young children, based essentially on local foodstuffs, can be very useful to meet the needs of the vulnerable groups. Joint FAO/WHO/UNICEF programmes for this purpose have been implemented in different countries of the world with a view to providing for use in

government-sponsored supplementary feeding programmes or for sale through ordinary commercial channels 1/.

478. The fact that food alone is not enough to ensure the success of a programme must be sufficiently stressed. It is necessary to have the delivery system which requires an administrative infrastructure, plus the facilities for storage, transport and distribution without which the programmes are doomed to failure or to incur great wastage. In this sense, it is considered highly desirable that in countries where there is little experience available for the organization of large or nation-wide programmes, pilot and demonstration projects should be first organized to establish the normative criteria for further expansion and to act as a training centre for the needed personnel.

479. If group feeding programmes are to have a significant impact, sufficient coverage, duration and continuity have to be ensured. The desirable coverage for each specific group of population is different. For example, in the nutritionally vulnerable groups (i.e. pregnant and lactating mothers, infants and pre-school children, which are malnourished/undernourished or at risk of becoming malnourished), the coverage should be sufficiently high to achieve a substantial reduction in the prevalence of mal- and undernutrition. Depending on local circumstances, the proportion of a country's population nutritionally at risk may be as high as 30 percent of the total 2/.

Types of Programme

480. Since problems and solutions vary from one country to another, and since the objectives referred to above are differently set by the diverse types of group feeding programmes, each country must decide on those to be adopted and the priorities attached to each one. The main feeding programmes to be considered are:

- Supplementary feeding for pregnant/lactating women, infants, and pre-school children. The main objective is to offer nutritional protection to these groups which are particularly vulnerable to nutritional deficiencies. They aim at providing

1/ The investment cost of such processing plants may be about US$1 million for a capacity of 2 000 tons of processed formulated products per year. It is obvious that for larger plants, designed to meet a demand both from feeding programmes and from the commercial market, lower unit costs could be achieved.

2/ This figure is arrived at by estimating that the low-income groups constitute around 70 percent of the population in developing countries, and that some 40 percent of these low-income groups may be undernourished or malnourished or at risk of malnutrition.

an important part of the daily nutrients and caloric requirements free of charge or at a low price. However, special arrangements are needed for reaching these groups, e.g. by promoting attendance at health centres, pre-school care centres, or by using the media to educate mothers in the adoption of breast-feeding and other sound child-feeding practices.

- Supplementary feeding for the primary school children. Although the principal goal of such schemes is nutritional, they can be useful to lay the foundations of good food habits, to influence the family dietary pattern, to stimulate school attendance and to improve school performance. The primary school programmes have, of course, priority over secondary school programmes.

- Mothercraft and Nutrition Rehabilitation Centres. Children who are suffering from moderate or severe (uncomplicated) malnutrition are received in these centres, living in or being taken home in the evenings. Some of these institutions also accept children who have been discharged from hospital and are still malnourished. A strong component of these services is the direct participation of the mothers in the process of nutrition rehabilitation of their children, receiving in this way practical education, especially in relation to diet and hygiene 1/. The cost of treatment and rehabilitation in these centres is but a fraction (about one tenth) of that given in the ordinary hospitals. Furthermore, because of the educational component, relapses are less frequent.

- Feeding of workers. These are socially-oriented programmes intended to increase the well-being, productivity and job stability of the workers. Such programmes can be implemented through the existence of canteens in the factories, plantations and offices, or in their neighbourhood, where safe and cheap food can be obtained. The International Labour Office has played an important role in creating and expanding these services.

- Feeding in hospitals. These programmes are commonly undervalued although they can contribute to nutritional support during recovery, to the treatment of malnourished children and to the feeding of health workers.

- Canteens or popular restaurants for the general public, particularly in low-income areas, established with the aim of delivering nutritionally adequate and cheap meals for the whole family. This is particularly important for families in which the mother is employed in a factory or other activities.

1/ Some aspects of nutrition education programmes are discussed in Chapter 12.

Costs and Financing

481. Experience accumulated over recent years in a number of developing countries shows that the average cost of supplementary feeding programmes is around US$20 per person per year 1/. This figure includes not only the cost of the food supplement but also the cost of (a) facilities and equipment for transport, storage, processing, preparation and distribution; (b) personnel and their training; and (c) nutrition education and demonstration activities.

482. The international community should accept a wider financial and technical responsibility for the establishment of feeding programmes in selected countries. It is suggested that the initial and immediate target might be to provide a feeding programme package to the least developed countries, whose governments are prepared to attach high priority to such a programme. In view of the widespread support which agencies such as UNICEF have always enjoyed, such a target would not seem unattainable. It should be possible to build further on this experience and set higher goals subsequently. Recalling that out of about 460 million persons estimated in the Assessment to be suffering from under- or malnutrition some 200 million are almost certainly children, the world community might set itself as a first step the target of providing supplementary feeding to say at least one quarter of these children. A programme covering 50 million children at an annual cost of $20 per head would cost $1 000 million, and perhaps half this sum could be met by the governments of the recipient countries. The remainder could provide a bold challenge to the vigour and inventiveness of UNICEF, WFP and the many voluntary agencies in raising the funds, helping to establish the administrative machinery and monitoring the efficacy of these programmes.

Evaluation

483. Evaluation should be a built-in element of feeding programmes. At least two criteria must be considered: (a) effectiveness, i.e. how well they reach their objectives, and (b) efficiency or how well they operate.

1/ Based on a daily ration comprising 100 g of a cereal; 30 g of dried skimmed milk; 10 g or 20 g of edible oil - providing from 550 to 650 calories, and 20 g of protein per person per day. This figure of US$ 20 has been calculated from data available from present-day on-going projects. Further rises in the cost of other foods or services would require that this figure will have to be revised.

484. The objectives of the assessment should be clearly stated in order to make it effective. Failure to collect adequate baseline data during the pre-project feasibility study, or to build into the project a system of record-keeping, may make the appraisal of the results very difficult or impossible.

485. Evaluation of the administrative and operational efficiency will relate to the deployment of the food, material, personnel and financial resources; the proportion of the target group reached; the acceptability of the food supplied; the regularity of the programme; the adequacy of the data collecting system. Evaluation must be a continuous process that will allow not only a final assessment, but also correct the plan of operations at intermediate stages in the programme.

486. It is proposed that the World Food Conference:

(i) Recognizing that special feeding programmes provide an effective method of achieving food transfers to vulnerable groups, urge governments to initiate such programmes or, where they already exist, expand them; and also where possible, support and strengthen special feeding facilities for workers;

(ii) Urge governments, in order to avoid wastage of resources, to devote attention to the organization of these programmes and to evaluating periodically their effectiveness and efficiency;

(iii) Recommend that governments agree as a minimum initial target to provide supplementary food to at least one quarter of the 200 million children in the world who are estimated to be suffering from malnutrition/undernutrition and request UNICEF to formulate on behalf of the international community and in cooperation with WFP and other agencies a concrete programme for achieving this, for consideration and financial support by governments;

(iv) Recommend that FAO, WHO, WFP, UNICEF and IBRD with the cooperation of other agencies and interested non-governmental organizations prepare an integrated project proposal for supplementary feeding of all vulnerable and needy groups of the population in a number of least developed countries who wish to give priority to such programmes in the context of national food and nutrition policies, indicating resource and management requirements; the draft proposal to be communicated to the FAO Council at its mid-1975 session through its Food and Nutrition Policy Committee, and to the governing bodies of the other interested agencies.

Chapter 11

Health Aspects and Specific Nutritional Deficiencies

A. Protein/energy malnutrition

487. Protein/energy malnutrition (PEM) 1/, the most important nutritional problem in infants and pre-school children in developing countries, should be viewed as the complex results of an insufficient diet in an environment where poverty is the rule. The effects of poverty in the genesis of PEM are seen not only in the inability of the family to produce or to purchase the food their children need, important as this may be, but also in the cultural deprivation and disease-prone environment with which poverty is usually associated.

488. Cultural deprivation leads to a lack of understanding of the dietary and hygienic basis of successful child raising and can also be manifested in a loss of the traditional patterns of life that protect the growing child. Resistance to the use of certain foods of highly nutritious value because of prejudices and taboos, the ignorance of elementary hygienic practices, the poor breast-feeding performance of the slum-dwelling mother, are causative factors of PEM in the young.

489. Infections and a poor diet are inextricably bound together in the causation of PEM. In the environment into which a large number of children in the developing nations are born, a heavy exposure to pathogens coupled with an increased susceptibility to infectious agents, once the nutritional status starts to deteriorate, leads to the vicious circle of malnutrition and infection, that sometimes spirals down into the severe forms of PEM: kwashiorkor and marasmus. Infections interact with nutrition by decreasing the resistance of the host, by lowering his normal food intake and by diminishing utilization of nutrients. In the environment in which undernutrition occurs, infection and infestation succeed one another, in such a way that an important number of children can be expected to be suffering from an acute or chronic infection during a considerable part of their first years of life.

490. If the measures that are aimed at improving the quantity and quality of the food supply referred to in this and other sections of this document (increasing income, supplementary feeding programmes, weaning foods, education and promotion), are implemented without decreasing the high exposure to infectious agents (inadequate sanitation, contaminated water supply, crowded living) offered by the environment in which malnutrition occurs, and without increasing the hosts' resistance (immunizations, prompt and adequate

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1/ Protein energy malnutrition (PEM): a range of pathological conditions arising from coincident lack, in varying proportions, of protein and energy, occuring most frequently in infants and young children, and commonly associated with infections (WHO/FAO Food and Nutrition Terminology Bulletin No. 28, 1974).

medical assistance, adequate clothing and shelter), their returns in lowering the high rates of PEM will be much less than expected.

491. PEM varies according to the types of environment, from the villages with their traditional pattern of life generally tied to subsistence agriculture, to the slums of the fast growing cities. In most developing countries, both conditions co-exist and formerly much more emphasis has been laid on the village-type situation. However, rapid urbanization is common in the developing countries and is bound to occur as a result of political independence and industrialization. Urbanization has been universally associated with a decrease in breast-feeding practice. Although this is of small consequence in an economically developed society, under the unhygienic conditions that prevail in the rapidly growing cities in the developing countries, early weaning can be singled out as the most important cause of protein/energy malnutrition in the child. If the infant is weaned at two or three months of age to a bottle-fed diet which is frequently overdiluted and contaminated, the stage is set for the vicious circle of malnutrition and infection. Breast-feeding is therefore a safeguard for the health and good nutrition status of the child and all efforts should be made to promote this practice.

492. Improvement of environment sanitation, of the quality of the water and of the basic health services must go hand in hand with nutritional measures if there is to be an important decrease in the number of children who suffer from PEM. Through the health services a series of programmes and activities can be implemented, aimed at the following objectives:

- improvement and maintenance of the nutritional status;
- control of infectious diseases;
- minimizing the effects of infectious diseases;
- surveillance of the population at risk: early detection and management of moderate cases;
- improved treatment and rehabilitation of moderate and severe cases of PEM.

493. Some of the actions and programmes related to the aforesaid objectives need a multisectoral approach (such as education, development of weaning foods, supplementary feeding programmes), and have been treated elsewhere in this document. Others relate specifically to the health sector (such as immunizations, rehydration, hospital treatment) and are beyond the terms of reference of the World Food Conference.

494. Finally, it must be emphasized that the control of PEM should be an objective of the plans for socio-economic development, and that concerted intersectoral measures necessary to bring about a significant reduction in its prevalence should be part of a well designed national food and nutrition policy.

B. Specific nutritional deficiencies

495. In contrast to the nutritional problems of a more general character, there are also specific nutritional deficiencies for which means are now known and available to control them and reduce them to levels at which they do not constitute a public health problem at a low cost and on a short or medium-term basis. Therefore, measures aimed at accomplishing these objectives can and should be implemented wherever needed. The principal specific nutritional deficiencies, judged by criteria of prevalence, long-term effects, social, economic and public health significance, and possibilities of intervention, are vitamin A, iodine, iron/folate and vitamin D.

496. Two approaches must be considered - as alternative or complementary measures - to deal with vitamin and mineral deficiencies: one is through the addition of the nutrient to a food (fortification), and the other consists in its direct administration to individuals that are thought to be especially vulnerable. Both approaches must be conducted at levels that ensure protection against the deficiency without risking overdosing.

497. A fortification programme is justified when there is dietary clinical and/or biochemical evidence of a specific deficiency in a population. The prevalence and the severity of the deficiency will define the priority to be assigned to such a programme. It can be designed to cover the whole population or target groups. The food to be fortified needs to have - amongst others - the following characteristics: that it is consumed in relative constant amounts by the people at risk; that the addition of the nutrient does not produce any negative change in the organoleptic properties of the food; that it can be produced in large factories where the fortification can be performed under efficient in-plant control. It is mandatory to pay due attention to the chemical compound used to supply the nutrient and the type of preparation employed in relation to (a) the stability of the added nutrient to oxidation, heat, light, humidity and other relevant factors, and (b) its biological availability in the fortified product used in the ways in which it is normally eaten, i.e. involving industrial and/or culinary treatments.

498. To ensure the success of a fortification programme, still other factors must be considered, such as: enforcement and legislative control, labelling and advertising. An important point is that fortification should not, as far as possible, increase the price of the food to the public. In fact, the cost of fortifying with vitamins and minerals is not great and can, in most instances, be absorbed by governments through direct or indirect subsidies and, in certain cases, by the industries themselves. International and bilateral aid can be instrumental in initiating and supporting food fortification programmes.

499. The direct administration of nutrients to the individuals who are at risk can contribute very effectively to the control and prevention of xerophtalmia, endemic goitre, nutritional anemias and rickets. The cost

of vitamins A and D, iron/folate and iodine preparations in forms that can be safely administered is not great. The main problem is how to reach the population at risk. Prevention of xerophtalmia, rickets and goitre through the use of massive doses is in some respects similar to vaccination. The methods, organization and experience gained in vaccination campaigns and programmes could be applied for this purpose. It is perfectly feasible that in some instances prophylactic doses of nutrients could be administered in conjunction with vaccination against infectious diseases.

500. The first obvious channels through which to reach the population at risk are the programmes and activities related to the health sector, such as maternity, mother and child health and other health centres, hospitals, family planning groups, malaria eradication units, etc. However, the coverage offered by the health services is usually too low to suit the purposes of controlling specific nutritional diseases through massive dosing. It is advisable, therefore, that other administrative services and community organizations, properly guided and trained, play a role: schools, agricultural extension, armed forces, clubs. The key to success lies in the identification of target groups, suitable methods of administration, a wide coverage and reiteration whenever needed.

501. Vitamin A deficiency (xerophtalmia) is closely associated with poverty and poor diets. The lowest intakes of vitamin A and carotenes are found in those areas where the staples are cereals and/or tubers, and the diet contains a low amount of animal foods, leafy vegetables and fruits. The pre-school child and the lactating mother are the most vulnerable individuals. Xerophtalmia occurs widely in several Latin American, African and Asian areas. In India, Indonesia, Bangladesh, Eastern Brazil, Philippines, for instance, this is a serious problem. It has attracted considerable attention because of the permanent incapacity caused by blindness and the resulting social and economic burden on society.

502. The medium-term measures for the control of xerophtalmia are:

- Fortification with vitamin A. Milk and milk products, margarine, vegetable oils and fats, sugar, cereals or their derivatives could be considered as vehicles. When dealing with non-fat foods, water-miscible forms of vitamin A are recommended for fortification, while in the case of fatty foods, i.e. margarine, a fat soluble preparation is to be preferred. As an example of the low costs involved in fortification, provision of the FAO/WHO recommended allowances of vitamin A for an adult man - as retinol palmitate added to sugar - will cost about U.S.$ 0.03 per year, and it is possible that more favourable figures will be obtained in the near future.

- Massive oral dose for nursing mothers: 100 000 International Units (I.U.) of water-miscible vitamin A, administered immediately after delivery, to protect the infant through an adequate level of vitamin in the mother's milk.

- Massive dose to infants and pre-school children: 100 000 I.U. of water-miscible vitamin A, administered orally one to four times a year, for at least two years.

- The World Health Organization is proposing to utilize an oral dosage of 200 000 I.U. vitamin A every six months to afford complete protection. India and Bangladesh have already initiated national programmes based on this methodology - the former through family planning units and the latter through malaria teams - and also other countries have pilot projects. Such programmes need support and expansion if the scourge of blindness from lack of vitamin A is to be eliminated. WHO estimates that the approximate number of children between one to five years of age, at risk of xerophtalmia, is 100 million; the price per 1 000 capsules of vitamin, each one containing 200 000 I.U., price based on UNICEF supply, is U.S.$ 10.50. Considering that each child has to be given 2 capsules, and including additional margin for price rise, storage charges and transport, the total annual cost for protecting 100 million one to five year old children all over the world against the risk of xerophtalmia, would be around U.S.$ 3 million.

503. Iodine deficiency. Endemic goitre is a widespread disease and has been reported from all the major areas of the world. It appears in early childhood and progresses into adolescence and sometimes into adulthood, women of childbearing age being of particular concern.

- Iodized salt has been proved successful in eliminating endemic goitre in different regions. Both potassium iodide and potassium iodate can be employed, the latter being the more stable. The cost involved is only for the iodine compound to be used and for running the iodizing plant. An estimate of the total population under risk of endemic goitre and cretinism in various parts of the world is 400 million. The total cost for salt iodization in the ratio 1:40 000 approximates U.S.$ 800 000. Considering miscellaneous expenses for continuous laboratory analysis of iodized salts in plants to be U.S.$ 200 000, the total annual cost attains U.S.$ 1 million. The costs of the factories, whether dry-mix or spray-type, are not included because in most of the goitre control programmes UNICEF supplies these factories.

- Protection by injections of iodinated oil is a very useful public health measure to be applied when iodization of the salt is impracticable and/or because the affected population is only restricted to a well defined area within a country. Injecting iodized oil gives protection for periods ranging from three to five years with a cost of 10 to 20 cents per head per year.

504. Nutritional anemias. Iron deficiency anemia is probably the most common form of specific nutritional deficiency in the world today, affecting mainly children and women of child-bearing age. Recent evidence has also suggested that nutritional anemia adversely affects the productivity of workers. Less frequent, and usually combined with iron deficiency,

is anemia due to folate deficiency, generally associated with pregnancy. Although the permanent solution to nutritional anemia will occur as a result of a larger consumption of animal products which are rich in biologically available iron, a decrease in the infestation rates with parasites that provoke excessive iron losses, and an increase in the general standard of living of the population, a short-cut can be effected through enrichment of foods and the administration of preventive doses in the more susceptible individuals.

- Fortification with iron of appropriate food vehicles, such as milled cereals.
- Fortification of some foods, such as certain milk products (very specially dried milk) or baby foods (weaning foods, cereal products, corn starch, etc.), to be consumed by infants and pre-school children.
- The direct administration of iron supplements, with or without folate, to the more vulnerable individuals. WHO proposes to cover the population at risk by distributing one tablet containing 60 mg elemental iron and 250 microgrammes of folic acid on alternate days. An estimate of the population to be protected - considering women from 15 to 45 years of a age and children from one to five years - attains 300 million, and the annual total cost of the supplements would be around U.S.$ 44 million.

505. Rickets. It is highly endemic in some regions and therefore must be considered among the specific nutritional deficiencies that should be eradicated on a medium-term basis, either through fortification policies or the administration of preventive doses to young children.

506. Two measures can be successful in controlling rickets:

- Enrichment of milk, milk powder and baby foods with vitamin D at the level of 400 to 500 I.U. per litre of milk, or of reconstituted product.
- Massive doses of vitamin D (200 000 to 400 000 I.U.) administered orally once during the first month of life and once at the beginning of the second year.

The cost of vitamin D for such a programme is about U.S.$ 0.07 per child. Assuming there are 30 million children at risk throughout the developing countries, the total cost would be about U.S.$ 2 million per annum.

507. It should be emphasized that the establishment of these short-cut measures does not necessarily mean that activities aimed at providing a definite answer to the problem of specific deficiencies - such as change in food habits through education and promotion, better use of food resources and eradication of parasitic diseases - should be disregarded. While the measures to provide iodine to the population at risk may have to be continued indefinitely, where the causative factor of the deficiency is inherent in the soil and water, the measures to control the other specific nutritional deficiencies will not be necessary when the dietary intake of the population improves to the desired level.

508. It is proposed that the World Food Conference:

(i) Recognize that PEM in mothers, infants and pre-school children is not only the consequence of an insufficient diet, but also of infectious diseases and lack of environmental sanitation with which poverty is generally associated and recommend governments to take action to strengthen the basic health services, and improve environmental conditions, and to implement programmes aimed at promoting and protecting the nutritional status of pregnant mothers, infants and pre-school children and at providing treatment and rehabilitation to those suffering from the moderate and severe forms of PEM.

(ii) Recognize that the deficiencies of vitamin A, iodine, iron/folate and vitamin D constitute a serious public health problem in a large number of developing countries and recommend to governments with the assistance of WHO and other international agencies concerned to establish a world-wide control programme (at an estimated cost of U.S.$ 50 million a year for the supplements) aimed at reducing these specific nutritional diseases significantly within a period of ten years.

Chapter 12

Consumer Education and Protection

A. Consumption Patterns and Consumer Education

509. Some people have unbalanced diets because they lack purchasing power, and for them the programmes recommended in the preceding two chapters are designed. Others have unbalanced diets because of their inappropriate food habits derived from tradition, from the influence of advertising or other external influences. Unbalanced diets are found not only in the developing countries, but also in the industrialized nations where a combination of excessive food intake, sedentary life and a dietary pattern (which includes increasing amounts of meats and dairy products) rich in cholesterol, saturated fats and sugar have been held responsible for the high prevalence of obesity, arteriosclerosis, ischemic heart disease and other degenerative diseases. The high amount of food wasted at home or in public eating places in the developed countries should also receive attention.

510. In the case of the developing countries, nutrition education is neither new nor a panacea. Education programmes have been the most widely applied nutrition intervention of this century. Yet their success in motivating changes in food behaviour among the vulnerable low-income groups in developing countries has been minimal. Many reasons for past failure, however, are now known and understood; deficiencies in planning and programming, inadequate comprehension of the factors which motivate behavioural change, inconsistent and conflicting messages from different education agencies (e.g. health, agriculture), insufficient funds and personnel, inadequate training in communication skills, and a widespread failure to use all available human and media resources to best advantage. Unsupported by a sound framework of national food and nutritional policies, education schemes have also endeavoured to function as an arm without a body.

511. The opportunity exists for both reorientation and revitalization of consumer education programmes on food and nutrition. Since the ultimate aim is to bring about behavioural changes which will result in improved food utilization practices, and consequently better nutrition, a strategy for consumer education should fulfil two conditions: (a) that the education process should be dynamic and consumer-oriented; (b) that the educational methods adopted must be adjusted to consumer capacity to act upon the information received.

512. Appropriate measures will naturally vary from country to country, according to socio-economic structures and the resources and channels available for educational action. In all countries, however, the

measures will be preconditioned by the circumstances, values and aspirations of the people themselves. Priority measures for attention will include:

- Sociological research: to analyze the socio-cultural and economic impediments to the adoption of available foods of high nutritive value.
- Promotion campaigns: to stimulate consumption of specific nutritionally beneficial foods.
- Control of promotion and other commercial communications that can have a negative nutritional impact.
- Expansion of training facilities: to secure more and better trained staff at all levels and in all relevant disciplines (agricultural extension, social sciences, nutrition, public health, home economics, education, food marketing and promotion).
- Greater utilization of available communications media to extend the coverage and strengthen the impact of nutrition information services.
- Organization of consumer advisory services to meet the information needs, especially of urban populations.
- Rationalization of government policies on food taxation and pricing to improve consumers' capacities to select and secure an adequate diet.

B. Protection of the Consumer through Food Control

513. National food control activities which have the primary function of consumer protection against health hazards and commercial fraud, have an equally important role in promoting better food storage and conservation practices. Food control legislation is useful in bringing about better food conservation, reducing food contamination or adulteration either through voluntary compliance with the legal provisions or through government action based on enforcement. When there are shortages in food supplies, increasing demand and higher prices, there may be a real difficulty in avoiding the appearance of foods of lower quality and adulterated or contaminated food in local markets and international trade. This will call for appropriate and efficient measures in food control.

514. The consumer should be protected against the health hazards conveyed through food and also against the fraud that results from the passing on to him of food of a quality inferior to that for which he has paid. Cases of food poisoning either accidental through contamination or provoked by the criminal adulteration of foods have caused permanent disabilities and deaths in large numbers of people in many countries.

515. Food control and food standards should therefore assume an even greater importance to protect the consumer, facilitate trade and generally assist in conserving man's food supplies. These activities should be considered within the framework of national food and nutrition

policies, and most of the developing countries need to emphasize the importance of an active and comprehensive food control policy that will not only protect the consumer, but also ensure appropriate surveillance and monitoring for the conservation, safety and quality of foods and for carrying out food enrichment programmes. In consequence, strong emphasis must be placed on the development of appropriate food laws and regulations and the establishment of the necessary facilities to do the actual work of food control, such as laboratories and inspectorates. This latter is not an easy task for many developing countries where the limiting factor is very often the availability of trained personnel of a sufficiently high technical level. It should be noted that a number of countries have yet to establish minimal facilities and that most developing nations need considerable expansion of their services so as to provide a significant coverage.

516. The work of the joint FAO/WHO Food Standards Programme, the main organ of which is the intergovernmental Codex Alimentarius Commission with a membership of 103 countries, has been motivated by two main considerations: (a) the protection of the consumer against health hazards and commercial fraud; and (b) the need for the widest possible measures of international agreement on food standards in order to facilitate international trade and reduce non-tariff barriers. As a result of increasing participation in the Commission's work, a number of countries, particularly among the developing nations, have been able to take advantage of the pooled experience in the fields of consumer protection and food quality control.

517. FAO, jointly with WHO, and with assistance from UNEP, is engaged in the development of an internationally coordinated food contamination monitoring programme. Such a programme should, in due course, provide information to the national authorities on the type, extent and levels of contaminants in food that may be considered hazardous and thereby enable governments to take appropriate action. Based on the data collected through this programme, it would be possible, through the Codex Alimentarius Commission, to develop international standards on contaminants in food which would further facilitate trade.

518. It is suggested that the World Food Conference:

(i) Recommend governments to strengthen and modernize consumer education services, including training for these, which promote consumption of foods of high nutritive value and emphasize the value of breast-feeding, and urge the international agencies to increase their support for these services;

(ii) Urge governments to protect consumers more adequately by strengthening their food legislation, providing more laboratories and inspectors and training the needed personnel for effective enforcement of legislative provisions;

(iii) Urge governments to increase their support of the Codex Alimentarius Commission in strengthening its programme to develop international food standards and codes of practices which protect the consumer from health hazards and commercial fraud, and facilitate the trade in foods moving in international commerce;

(iv) Commend the development of an internationally coordinated joint FAO/WHO food contamination monitoring programme to assess the type, extent and level of contamination in man's food in different parts of the world and provide early information to the national authorities for appropriate regulatory action.

Section III

ACTION TO STRENGTHEN WORLD FOOD SECURITY

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ACTION TO STRENGTHEN WORLD FOOD SECURITY

519. Along with the action needed to expand food production (Section I) and the distribution and consumption programmes oriented toward the elimination of hunger and undernutrition (Section II), it is also urgent to take steps to avoid or minimize the impact on food consumption levels of acute food shortages caused by widespread crop failures, natural disasters, or year-to-year fluctuations in production. The experience of the past two years has demonstrated dramatically how serious this problem can be.

520. There is nothing new about production fluctuations and shortfalls owing to natural causes. However, with the disappearance of the large North American cereal surpluses, which could be drawn upon in times of need thus providing a measure of security, the world faces a new and unstable situation. Until a cushion of adequate stocks can be re-established, the outlook is for more frequent and violent oscillations in world supplies and prices and - which is more serious - the basic food needs of millions of human beings in developing countries will be periodically in jeopardy. When such crises occur the social and economic development of whole nations could be halted or even reversed. Nor would the damage be limited to the individual countries suffering food shortages. The scramble for supplies and the consequent increases in world market prices would bring periodic inflation to all the countries of the world.

521. What action is required to prevent this sequence of events from occurring? How can a minimum level of food security be achieved for the international community? A major contribution, without doubt, will come from the expansion of food production in the developing countries, reducing their dependence on external supplies and enabling their peoples to achieve and sustain more adequate consumption levels. Such an expansion will provide a certain safety margin which many developing countries at present do not have.

522. But this will take time and would not by itself ensure adequate food security for the world. As has already been recognized by ECOSOC and by the FAO Council and Conference, action is needed concurrently in other directions, in order to evolve a meaningful World Food Security policy. The most important elements of such a policy are:

(i) the establishment of a food information and early warning system;

(ii) a coordinated system of national stock policies embodied in an International Undertaking on World Food Security;

(iii) better arrangements for meeting emergency requirements for food supplies; and

(iv) the reorganization of food aid as a continuing form of relief and development assistance.

Chapter 13

Food Information and Early Warning Systems

523. The capacity of governments to deal with food shortages depends to a large extent on the timely availability to them of adequate information concerning the current and prospective crop and food situation. Some already have well-organized networks providing timely data on crop prospects, harvest results, levels of stocks and their locations, prices in various markets, fertilizers and other agricultural inputs. Many others have incomplete systems or ones which function poorly. The first action should be to improve the national reporting services on current conditions and factors affecting crops, stocks, inputs and prices and likewise the speedy collection and processing of the information received at some central point within each country. More extensive meteorological information directly relevant to agriculture would also be needed. Only to the extent that reliable data are available at national level can an international system function effectively. 1/

524. At the international level FAO has for many years operated a system of regular reporting by member governments as part of its commodity market intelligence services and for its various statistical publications. Furthermore, since the establishment in 1968 of the Early Warning System for Food Shortages, FAO and World Food Programme field staff send in monthly data from over 70 countries. For the Sahelian countries this Service has recently been stepped up to more frequent reporting. Export availabilities and import requirements of cereals and other basic foods as well as data on national policies are reported annually to the Intergovernmental Groups on Grains, on Rice, on Meat and on Oilseeds. A wide range of statistical information on wheat is also collected regularly by the International Wheat Council and on other commodities by their respective commodity secretariats. Through its "World Weather Watch" (WWW) the World Meteorological Organization (WMO) has developed a programme for the acquisition, exchange, analysis and archiving of weather reports on a global basis, which could be adapted and utilized in connection with a crop forecasting programme.

525. Yet, in spite of these activities, the existing supply of information at world level does not permit timely identification of many of the crop shortfalls which it should be possible to predict. From some important countries information is unavailable, from some it is incomplete, and from some it arrives too late to be useful. Moreover, the analysis and interpretation of certain classes of data, notably on weather/crop relationships, could be greatly improved. Measures and policies which governments may decide to

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1/ The need for early warning and assessment of long-term factors affecting agriculture is also recognized and is under development within the framework of the United Nations Environment Programme, especially in the context of its Earthwatch Programme.

undertake, individually and collectively, to promote food security may be ineffectual if the food information system is not strengthened and improved.

526. The first basic step is for each country to review its data-collecting system in the fields of food production, supplies of important inputs such as fertilizers, and meteorology, and introduce such improvements as may be necessary to enable it to collaborate effectively in international arrangements in these fields. Also, the existing national systems for collecting and analyzing meteorological information would need to be reviewed, strengthened and adapted, as appropriate, so as to develop a better basis for forecasting fluctuations in food production. Some governments may wish to request technical assistance on particular aspects of strengthening existing arrangements in both fields.

527. The second step is to develop adequate arrangements at the international level. Following a decision of the FAO Conference in 1973, the FAO is strengthening its Food Information System which will incorporate an expanded Early Warning System, the existing Food Aid Information service and the various commodity market intelligence services, and be linked up with the work of the specialized intergovernmental bodies. Into this system will also be fed pertinent material from private trade and industry and especially from governments, on cereals, soybeans and other oilseeds and livestock products, as well as relevant information on availability of fertilizers and other essential inputs. The information so assembled would be disseminated to governments in suitable periodic reports, giving a comprehensive picture of the world food supply conditions in relation to food demand situation and prospects. An attempt will also be made to identify at an early stage countries or regions where acute food shortages are expected. In this way the Food Information System would assist the international community to take timely and appropriate measures. The effective functioning of the Food Information System would contribute to the achievement of the objective of the draft International Undertaking on World Food Security (Chapter 14).

528. The third step, therefore, is to extend and accelerate the communication of information by governments to the international system. The success of an international food information system will depend on the ability and willingness of all governments, especially (but not only) of the major food producing and consuming countries, to provide the necessary data. Bilateral exchanges of information between trading partners, such as has been provided for in the recent U.S.S.R./U.S.A. information agreement, can also play a useful role. It is in the interest of all countries to share in this effort, as it will enable producers, traders and governments to react more promptly to changes in supply situations. In respect to crop forecasts and stock data, the publication of which influences market prices, appropriate arrangements may have to be made between governments and FAO to keep certain national information confidential until agreed release dates.

529. A fourth step is to adapt the World Weather Watch System, particularly with respect to network density, specific meteorological stations, coverage, and type and frequency of weather and climatic information required,

to enable it better to serve agricultural purposes. The available weather reports and monthly climatic data obtained through WWW could be used under WMO's auspices for regularly assessing the world's current and immediate past weather, and also for identifying significant changes in weather patterns such as the onset of drought conditions in a particular region.

530. However, much of the potential value of weather information to agriculture can be realized only when the meteorologist, working closely with agriculturalists, develops information and analyses suited to the specific needs of the farm sector. Systems have now been worked out in certain countries for preparing regular weather-based estimates of national crop output. Reliable assessments of the world's weather for use in agricultural planning and forecasting, however, require more research on crop/weather relationships within specific environmental conditions, which is a highly complex field. Emphasis in research should be given to experiments on crop/weather relationships and related data acquisition on a global basis with special emphasis on wheat, rice and maize; and the development of crop/weather models for national and eventually regional and global estimates of food production. The International Rice Research Institute, for example, is reported to be developing such a system.

531. An associated aspect of the development of crop forecasting based on weather information is the need for assessments of the probability of extreme weather events such as drought occurring in various areas over one or more seasons. Such assessments which would be based on a statistical analysis of climatic information, would provide guidelines to decision-makers who are required to assess the risks of serious crop failure. The need for more research on obtaining a better understanding of the causes of climatic variations is also required.

532. The use of satellites for special purposes in meteorology and agriculture also needs to be studied and assessed in depth, in particular with respect to the surveillance of snow and ice cover, soil moisture, locust and other insect migrations, diseases of crops and mass damage due to pollutants.

533. In the light of these suggestions the World Food Conference might wish to:

(i) Stress the need for a more timely and adequate flow of information concerning weather, agricultural inputs, crops, stocks, prices, export availabilities, import requirements and other relevant matters in order to ensure the world food security in a constantly changing food situation and request governments to take steps, where necessary, to amplify and otherwise improve their data collection services in these fields;

(ii) Request the cooperation of all governments in furnishing, on a regular basis, all the information required by the FAO Food Information and Early Warning System on crop conditions and other relevant aspects of their food supply and demand situation affecting world food security;

(iii) Request the World Meteorological Organization in cooperation with FAO (a) to provide as a part of the Early Warning System, regular assessments of current and recent weather on the basis of the information presently assembled through the World Weather Watch, so as to identify agriculturally significant changes in weather patterns; (b) to establish a joint research project to investigate weather/crop relationships, especially regarding wheat, rice and maize, taking into account the activities already undertaken by certain research institutions; (c) to assess the need to strengthen the present global weather monitoring systems in regard to the adequacy, geographical coverage, type and frequency of meteorological observations which are of special importance to agriculture, in order to develop a better basis for forecasting possible changes in food production; (d) to encourage research on assessing the probability of adverse weather conditions in one or more successive seasons in various key agricultural areas of the world, and on obtaining a better understanding of the causes of climatic variations.

Chapter 14

International Undertaking on World Food Security

534. The dramatic depletion of the cereal stocks of the major exporting countries since 1972 has called public attention as never before to the crucial importance of maintaining an adequate year-round flow of food. In addition, in view of the declared intention of the major exporting countries to prevent the accumulation of similar surpluses in future, it became apparent that all nations would have to re-examine their stock-holding policies. The need for international action on World Food Security was supported in 1973 by ECOSOC at its Fifty-Fourth Session and by the FAO Conference at its Seventeenth Session.

535. In the matter of stocks of food, particularly of cereals, practices differ from country to country. The major exporting countries usually carry stocks which are larger just after harvest and reach a low point prior to the new harvest, apart from any longer-term tendency for surpluses to accumulate or run down. Several self-sufficient or importing countries carry sufficient stocks to take care of all but the most exceptional domestic emergencies. Other countries carry stocks merely sufficient for normal carryover and expect to use the world market to make up for any harvest shortfalls. This latter policy can be pursued as long as world reserves remain large and the shortfall in any individual year is moderate, but it becomes perilous in the case of massive shortfalls or when world surplus stocks have vanished. It was the conclusion of the FAO Conference and of ECOSOC that the assurance of an adequate availability of food is the common responsibility of the international community.

536. With these considerations in mind, the Director-General of FAO proposed that governments should adopt an International Undertaking on World Food Security, its central feature being that countries should undertake to adopt national stockholding policies which, in combination, would maintain at least a minimum safe level of basic food stocks, principally cereals, for the world as a whole. The Seventeenth Session of the FAO Conference supported the Director-General's initiative and referred the draft International Undertaking to an ad hoc Working Party on World Food Security which met in May 1974 and prepared a revised text of the Undertaking. The Council of FAO, at its 63rd Session (July 1974), endorsed in principle the Undertaking as revised by the Working Party and authorised the Director General to make it available to the World Food Conference (Text of the Undertaking is reproduced in Annex A). The formal transmission of the Undertaking to individual governments inviting their adherence will take place after the FAO Council has finally adopted it at its 64th Session in November 1974, taking into account the report of the FAO Committee on Commodity Problems (49th Session) and the views and recommendations of the World Food Conference. The active participation of all major

cereal producing and consuming countries in the formulation and eventual operation of the Undertaking is especially important. The impact of the Undertaking will be enhanced as more and more governments accept it and implement its provisions.

537. The operative paragraph 3 concerning stockholding policies of the revised text of the International Undertaking reads as follows:

> "As regards stockholding policies, all governments, in conformity with their institutional and constitutional requirements should:
> (a) adopt policies concerning cereals stocks 1/ which take into account the policies of other countries and would result in maintaining a minimum safe level of basic cereals stocks for the world as a whole.
> (b) review or establish, or take measures aimed at establishing, stock targets or objectives which have the purpose of maintaining stocks of cereals in the country or in the interested groups of countries concerned at least at the levels regarded as necessary for ensuring continuity of supplies including provision for emergency situations in case of crop failure or natural disaster 2/.
> (c) take measures aimed at ensuring stocks are replenished as soon as feasible whenever they have been drawn down below such minimum levels to meet food shortages".

The International Undertaking also covers other provisions relating to Guidelines for Establishing and Holding Stocks, Safeguards, Special Assistance to Developing Countries, Information System and Intergovernmental Consultations.

1/ The terms "stocks" means the supply of cereals carried over in stock at the end of the marketing year of the country concerned.

2/ It is recognized that some of the major exporting countries of grains and especially rice are developing countries with lack of capital resources to maintain stocks beyond current requirements.

538. Since the determination of what quantity constitutes in each country a minimum safe level of stocks is to be left to the country's own decision, the Guidelines enumerate the principal considerations which should be borne in mind in making such a decision. But the ad hoc FAO Working Party agreed that the techniques for assessing the desirable minimum size of national stocks along with other unresolved practical problems should be further examined by groups of experts as well as by the Intergovernmental Group on Grains and the Committee on Commodity Problems.

539. It may be noted that the FAO Secretariat has recently estimated that for the world as a whole, total carryover stocks corresponding to 17-18 percent of world consumption of cereals might be judged "a minimum safe level for food security" which would compare with a carryover of 25 percent in 1970 when there were surpluses and of 11-12 percent in 1974 1/. At the 1974 level of consumption, a "safe" carryover for the entire world would therefore amount to some 230 million tons 2/. This would include working stocks (including an allowance for food aid commitments under the long-term food aid policy proposed in Chapter 16) and emergency reserves (including any stocks held under the international policy for emergency stocks proposed in Chapter 15). The precise composition of these stocks, between wheat, rice and coarse grains and their distribution between exporting and importing countries can only be determined and modified by governments during regular intergovernmental consultation to implement the proposed Undertaking, taking into account, inter alia, their commitments to food aid and international policy for emergency stocks. To some extent the desirable level of stocks would depend on their geographical location, but it is particularly important for major developed countries, especially those subject to large fluctuations in grain output, to develop an adequate stock policy.

1/ World Food Security: Draft Evaluation of World Cereals Stock Situation (Preliminary Draft); doc. CCP:GR 74/11, prepared for consideration at the Eighteenth Session of the Intergovernmental Group on Grains, September 1974.

2/ For purposes of comparison, it may be noted that the minimum safe level of world stocks, excluding China and U.S.S.R. (for which current stock data are not available) is estimated at 150 million tons which compared with the present carryover level of 100-105 million tons for this group of countries.

540. Under the heading of Safeguards, the draft Undertaking invites countries to conduct their policies regarding accumulation and disposal of stocks in a manner which would avoid harmful repercussions on the structure of production and trade, and to continue to observe the principles and consultative obligations as developed within FAO and the Consultative Sub-Committee on Surplus Disposal. The ad hoc Working Party requested further study of the price effects of stockholding policies - some aspects of this question are discussed in Chapter 17.

541. The draft Undertaking recognizes the need for special assistance to developing countries in the form of technical, financial and material aid for expanding their agricultural production and in the form of food aid. Further, a number of developing countries are already seeking advice from FAO and other agencies on various aspects of creating or augmenting national security stocks. FAO has responded by sending missions in collaboration with UNDP, the International Bank for Reconstruction and Development and the World Food Programme to identify the types of assistance required.

542. The establishment of specific national grain stock targets by at least 26 developing countries, and preparatory activities to this end in another 22 developing countries, show a strong interest in this type of action. Estimates, based on specific assumptions of the type and amount of storage, other facilities and technical services required, show that funds (excluding purchase of grains) of the order of $200-300 million would be needed for a five-year action to help implement these national grain reserve targets and action plans in these 48 countries initially. If external sources were to fund say, 75 percent of the programmes' total cost, about $ 150-225 million would be required for creating the necessary storage facilities and technical services, the balance of the cost being met from local resources in the developing countries concerned. As regards the commodities required, the actual stocks in developing countries show a shortfall of several million tons of grains below their official minimum stock targets; part of this shortfall might be financed internationally, either under food aid programmes or through direct financial assistance. The IBRD sees the possibility of financing the initial food stocks themselves, as part of an overall project. The International Monetary Fund could assist countries in tiding over temporary or medium-term balance of payments problems that could arise in building up, maintaining or replenishing reserve stocks, while necessary policy adjustments are being made. The IBRD and the Regional Banks are also ready to finance storage facilities and related infrastructure providing they are a part of development projects.

543. Such stocks would enable the developing countries to play an effective role in the international policy for emergency stocks envisaged in Chapter 15. Where the physical holding of the stocks in a developing country at a given time was not practicable, the developing country might prefer, with the assistance of the international community, to contract with other developing or developed countries to hold stocks for them. These would be delivered upon call of the developing country for which the specific stocks

were being held. Such arrangements should include the provision by the international community for immediate access to and payment for the necessary transport of stocks held on behalf of developing countries.

544. In order to keep under continuing review the progress toward achieving and maintaining world food security, it is envisaged that participating governments should regularly consult together. These consultations would review what was being done to accelerate cereals production in developing countries, would evaluate the adequacy of current and prospective stock levels and would examine policy action necessary for assuring adequate cereal supplies. As to the mechanisms of consultation, the ad hoc Working Party recognized that full use should be made of the existing bodies but considered that the operational aspects of the scheme should be entrusted to a specialized committee. Close cooperation would be maintained with the International Wheat Council and, if appropriate, joint consultation machinery would be established.

545. Considering the overriding importance of ensuring minimum food security for the world and progress already made in FAO in developing a common approach toward these objectives, the World Food Conference may wish to:

(i) Reaffirm the common responsibility of the entire international community in evolving policies designed to ensure world food security and in particular in maintaining adequate national stocks especially of cereals as embodied in the International Undertaking endorsed in principle by the FAO Council;

(ii) Recognizing that universal participation of all countries is essential for the achievement of the global objectives of world food security, stress the importance of adherence to the Undertaking by all governments;

(iii) Invite the appropriate intergovernmental bodies of FAO to complete as soon as possible the operational and other practical arrangements required for the implementation of the International Undertaking, collaborating as appropriate with the International Wheat Council and other relevant international organizations;

(iv) Urge governments and the concerned international organizations to provide additional technical and financial assistance on specially favourable terms to develop and implement appropriate national food stock policies in developing countries.

Annex A to Chapter 14

DRAFT INTERNATIONAL UNDERTAKING ON WORLD FOOD SECURITY

(as endorsed in principle by the FAO Council at its 63rd Session, July 1974)

I. Common purpose and responsibility

1. Governments adhering to this Undertaking, taking account of Resolution 3/73 adopted by the Seventeenth Session of the FAO Conference, recognize that the assurance of world food security is a common responsibility of the entire international community. They, therefore, undertake to cooperate in doing their utmost to ensure the availability at all times of adequate world supplies of basic foodstuffs, primarily cereals, so as to avoid acute food shortages in the event of widespread crop failures or natural disasters, sustain a steady expansion of production and reduce fluctuations in production and prices.

2. Recognizing that food security needs to be tackled from several sides, especially through strengthening the food production base of developing countries, appropriate national stock policies, food aid programmes, and other measures including long-term trade agreements, governments undertake to adopt national and international measures to ensure an accelerated growth of food production, as appropriate, and in particular to assist the developing countries which are highly vulnerable to crop fluctuations and where there are increasing consumption requirements.

3. As regards stock-holding policies, all governments, in conformity with their institutional and constitutional requirements should:

(a) adopt policies concerning cereal stocks 1/ which take into account the policies of other countries and would result in maintaining a minimum safe level of basic cereal stocks for the world as a whole.

(b) review or establish, or take measures aimed at establishing, stock targets or objectives which have the purpose of maintaining stocks of cereals in the country or in the interested groups of countries concerned at least at the levels regarded as necessary for ensuring continuity of supplies including provision for emergency situations in case of crop failure or natural disaster 2/.

(c) take measures aimed at ensuring stocks are replenished as soon as feasible whenever they have been drawn down below such minimum levels to meet food shortages.

4. In periods of acute food shortages, nations holding stocks in excess of minimum safe levels for meeting domestic needs and emergencies undertake to make such supplies available for export at reasonable terms.

1/ The term ''stocks'' means the supply of cereals carried over in stock at the end of the marketing year of the country concerned.

2/ It is recognized that some of the major exporting countries of grains and especially rice are developing countries which lack the capital resources required to maintain stocks beyond current requirements.

II. Guidelines for establishing and holding stocks

5. In establishing, reviewing and/or adjusting national stock policies and desirable minimum stock levels, governments should give consideration to the following guidelines, which are understood as a framework within which each country would develop its own stock policies according to its circumstances:

(a) Vulnerability to crop failure owing to drought, floods or other natural hazards, and extent of resulting shortfalls in national cereals output.

(b) The size of normal annual requirements for domestic consumption and, where applicable, for export.

(c) The degree of dependence in normal conditions on imports of cereals and the scale of possible emergency import requirements in relation to the average level of world trade of the product concerned.

(d) The period of time required for imports to be arranged and delivered to the country in periods of emergency or sudden domestic shortage, and for internal transportation to centres of consumption.

(e) The period of time likely to be required to expand cereal production sufficiently to replenish stocks if these are drawn down to meet food shortages.

(f) The proportion of national supplies entering commercial market channels.

(g) The requirements of any government distribution programme of foodgrains to vulnerable sections of the population.

(h) The desirability of locating stocks in a manner and place which ensure that the cereals are available for delivery when and where they are most likely to be required, and which, with the available storage and transport facilities, minimise the financial costs involved and also, where appropriate, facilitate urgent shipments to recipient countries in the shortest possible time.

(i) Pledges to WFP and other international food aid programmes and allocations for bilateral food aid programmes, including specific pledges for national and regional stock-building.

(j) Maintaining a regular flow of supplies at reasonable prices to meet foreseeable variations in demand from importing countries.

(k) The possibility of an interruption in the flow of imported supplies by events outside the government's control (dock strike in exporting country, shipping difficulties, etc.).

(l) The special position of developing countries, as set out in Part IV below.

6. The special difficulties of a number of developing countries in maintaining national stocks at desirable minimum levels place an added responsibility on the rest of the international community for ensuring world food security. Governments should take this into account in fixing their stock targets or objectives, and should where possible earmark stocks or funds for meeting international emergency requirements.

III. Necessary safeguards

7. Bearing in mind the serious problems which have arisen in the past owing to the accumulation and disposal of large agricultural surpluses, full consideration should be given by governments to the possible repercussions on the structure of production and trade which might arise from implementing the world food security policy. Governments should continue in this respect to observe the principles and consultative obligations as developed within the FAO and the Consultative Sub-Committee on Surplus Disposal which may be amended and extended as necessary.

8. To this end:

(a) All countries should endeavour to arrange their national food stock policies in ways which avoid adverse effects on the structure of production or international trade, paying particular attention to the interests of developing countries heavily dependent on food exports.

(b) Governments should recognize the need to promote the efficient use of world agricultural resources and consider measures designed to afford producers adequate protection against the effects on world prices of accumulation, retention and release of stocks held as a result of this Undertaking.

IV. Special assistance to developing countries

9. To promote the effective participation of developing countries in this Undertaking, in order to achieve the objectives of world food security, it is imperative to ensure the adequate availability of cereals and accordingly an acceleration of the rate of growth of their agricultural production. Such an increase requires a constant review by the developing countries of their overall agricultural production policies and the various alternative courses they may follow as well as the active support of the international community in the development programmes of the developing countries within the context of their national development priorities. The concerned international financial and technical organizations, the developed and other potential contributor countries should urgently take the necessary measures to enable the developing countries to obtain the required financial, technical and material assistance, and in particular fertilizers and other inputs needed to increase their agricultural production.

10. Continued reliance would also need to be placed on bilateral food aid programmes and the World Food Programme for meeting shortages which cannot be covered through normal commercial trade, as well as unforeseen shortages and emergency situations.

11. International assistance also has an important role in providing food aid and financial assistance on soft-terms or in grant form for meeting the minimum requirements of cereals and the maintenance of stocks, and particularly emergency stocks, in the developing countries, for research on the development of storage facilities suited to conditions in these countries, and in furnishing advice on stock and related policies within the context of national development programmes. Developed countries and other potential contributors as well as the international and regional development agencies concerned should give additional assistance in identifying and mobilizing the resources required by developing countries for these purposes.

12. As regards the WFP in particular, the degree to which it can assist developing countries by providing food aid for national reserves is severely restricted by its resource position and its priorities. Governments should, therefore, consider making additional resources available to the WFP, to enable the Programme to play its role to the fullest possible extent in assisting developing countries to achieve food security as well as in emergency operations.

V. Information system

13. The effective functioning of the world food security system will depend greatly on the availability of timely and adequate information. Government members of FAO should furnish to the Director-General on a regular basis all the available information on national stock levels, government stockholding programmes and policies, current and prospective export availabilities and import requirements for cereals, and relevant aspects of the supply and demand situation, as well as on assistance provided to the food production programmes in developing countries. Other governments should be invited to provide similar information. In order to avoid unfavourable market repercussions in particular, the Director-General of FAO should ensure, where so requested by a government, that the data supplied by that government to the Information System are made available on a restricted basis only to the governments adhering to the Undertaking.

14. To keep all governments directly informed of current developments in the international cereals position during periods when world supplies are scarce the Director-General of FAO should prepare, on a quarterly basis or more frequently, concise factual appraisals of the situation and outlook which should be circulated promptly to governments.

15. In the assembly and analysis of information and statistics, the Director-General of FAO should seek the assistance of the International Wheat Council and other intergovernmental organizations concerned.

VI. Intergovernmental consultations

16. The adequacy of world cereal production and stocks should be kept under continuing review, so that timely action can be taken to maintain world food security. For this purpose, the governments adhering to this Undertaking should, with the assistance of FAO

and other concerned intergovernmental organizations, consult together to:

(a) Review the progress in accelerating cereals production in developing countries and the assistance provided to them for this purpose, particularly in regard to the supply of essential agricultural inputs.

(b) Make periodic evaluations of the adequacy of current and prospective stock levels, in aggregate in exporting and importing countries, for assuring a regular flow of supplies of cereals to meet requirements in domestic and world markets, including food aid requirements, in times of short crops and serious crop failure; account should be taken of the considerations set out in the guidelines; and

(c) examine such short-term and longer-term policy action as considered necessary to remedy any difficulty foreseen in assuring adequate cereal supplies for minimum world food security.

VII. Provision for review of the Undertaking

17. This Undertaking, including arrangements and guidelines, may have to be revised, particularly if future international negotiations lead to the assumption by governments of specific commitments substantially affecting the Undertaking.

Chapter 15

Improved Arrangements for Meeting Emergency Food Needs

A. Emergency Relief Arrangements

546. In tackling the food problems of the world there is an obvious need for making adequate provision for meeting the emergency food requirements that arise as a result of events that are beyond the control of governments and of individual producers and consumers. Even if the longer run food and nutritional needs of the developing countries can be met by increasing food production, unforeseen and uncontrollable events will from time to time create situations requiring action by the international community to prevent famines or serious food shortages in the affected countries or regions.

547. Large-scale disruptions of food production may occur in both developed and developing countries. Such emergencies may place undue strain upon the entire world supply system, but in the case of developing countries the entire development programme of the affected nation may be halted or even reversed for a year or even several years as a result of larger budgetary and foreign exchange expenditures in importing and subsidizing food.

548. International concern to help countries faced with food emergencies is of long standing. Bilateral arrangements constitute by far the biggest single source of emergency food relief and they may be expected to continue to occupy an important place in the future. In the UN system the main responsibility for emergency food relief rests with FAO and the World Food Programme, and a small part of the resources of the WFP is earmarked by its Intergovernmental Committee (IGC) for emergency food relief on the approval of the Director General of FAO. Since the establishment of the WFP in 1963, and until March 1974, about 178 emergency operations were sanctioned in 76 countries costing around U.S.$ 136 million. In recent years, special ad hoc international arrangements have also been made to meet large scale emergencies involving food as an important element in relief operations. These include, for example, the disignation of UNHCR as the focal point in the UN for dealing with the influx of refugees in India in 1971; establishment of UNDRO for mobilizing and coordinating efforts to provide immediate humanitarian relief in Bangladesh; and the Sahelian Drought Relief operations in 1972 under the leadership of FAO. The UN Disaster Relief Office (UNDRO) has been established since 1972 to provide general coordination of relief, while entrusting the operational activities of food emergencies to the technical agencies traditionally dealing with them.

549. A number of non-governmental organizations and voluntary agencies have also been active for a long time in the field of emergency relief, e.g. the League of Red Cross Societies, CARITAS, World Council of Churches, CARE and OXFAM. These non-governmental organizations provide food in many cases in addition to other relief inputs, but emergency food relief

does not normally constitute the major or most important part of their humanitarian activities.

550. In dealing with larger scale emergencies, an initial element described earlier is the development and improvement of the FAO Early Warning System. When the information available indicates definitely that an emergency is threatening, coordinated action should be developed and set in motion by initiative of the Director-General of FAO, as provided under the existing ECOSOC authority, to alert governments, appropriate UN agencies and non-governmental organizations following an appropriate request from the government concerned. If food is the major component in the relief required, it should then be incumbent on the Director General of FAO, in consultation with the Secretary General of the UN, as appropriate, to issue an appeal to mobilize the necessary resources - both bilateral and multilateral - and synchronize the entire relief effort of the UN system in concert with assistance provided by bilateral donors.

551. Another important requirement is that the developing countries themselves develop pre-disaster plans or improve existing procedures to operate in times of natural disasters. A number of countries already have detailed and time-tested national emergency famine relief codes; other countries should be assisted to prepare similar codes. In times of large-scale crop failures the people who suffer the most are those subsistence producers and rural labourers who are not normally dependent upon market supplies for their subsistence and who by the fact of their remote and often inaccessible locations are difficult to reach via market channels. Therefore, special attention should be given, by the developing countries and the developed countries providing emergency assistance, to the problems of creating special emergency distribution systems adequate to ensure that such groups will not be overlooked. In urban areas and easily accessible rural areas special attention should be given to providing channels of distribution that take care of the most disadvantaged groups of the population.

552. As regards the operational aspects of providing relief supplies in emergencies, experience over the last 25 years has demonstrated that the origins, characteristics and requirements of food emergency situations - an particularly large-scale emergencies - differ widely. There are wide variations in the magnitude and circumstances of disaster, the number of people and countries threatened in the region affected, the number of donor countries and organizations involved, and the type of logistic problems to be resolved. In this connexion, the specific problem of transporting food to a disaster-stricken area must be stressed. Experience bears out that in some circumstances it may be necessary to develop, on a planned basis, special forms of transportation, including air transport, both for international bulk movement and for national end-point distribution. There is also the need to tailor each international relief operation to the special characteristics of the particular emergency situation. This objective, however, can only be effectively achieved if a great deal of flexibility is retained so as to adapt the international emergency arrangements to the specific needs of the circumstances.

B. Internal Policy for Food Aid

553. It will also be recognized that while food is usually the major part of disaster relief, there are often other requirements for clothing, shelter, transport and medical supplies. In such cases, the UN Disaster Relief Office coordinates the relief efforts of the concerned organizations such as FAO, WFP, UNICEF and WHO, one of the organizations assuming the role of the "lead agency" depending on the characteristics of the emergency.

554. A crucial contribution to meeting such emergencies is to develop national food stock policies both in developed and developing countries as envisaged in the International Undertaking on World Food Security being developed under the auspices of FAO (see Chapter 14). In the case of developing countries, such policies will usually require international financial and technical assistance in their implementation, including development of adequate storage facilities, the acquisition of the desired quantities of food stocks, and in times of emergency the implementation of large-scale distribution programmes to reach affected groups.

555. However, it is to be expected that from time to time the magnitude of the emergency needs may far exceed an economically feasible national stock policy in developing countries, especially those with large populations. Hence the need to formulate an international policy for emergency stocks which would provide for the holding of food stocks, primarily grains, by developed countries to be used for the meeting of emergencies by supplementing the stocks held or owned by the developing countries themselves.

556. These emergency stocks should be clearly earmarked for use to meet the emergency needs of developing countries with agreed-upon criteria for their release for such needs. They should thus be isolated from the normal commercial stocks and trade and should not be drawn upon for normal trading purposes.

557. The cost of acquiring, holding and delivering emergency stocks in either developing or developed countries should be equitably shared by developed countries and other countries with adequate financial resources. The cost sharing formula should be evolved and agreed upon in some appropriate international forum which includes all nations expected to contribute to such costs.

558. Bilateral emergency relief will continue to be essential for meeting large-scale emergencies and the proposed international policy for emergency stocks will considerably enhance the capacity of governments to respond to large emergency food needs. At the same time, it would be highly desirable, as an additional measure, to strengthen the multilateral emergency food relief facility by creating a small international Food Reserve. The creation of such an international reserve would close a real gap in the world food security by enabling multilateral agencies such as WFP to take quick action on a more adequate scale to meet the emergency needs arising in those

developing countries where national security stocks are lacking or inadequate. It would also make the Early Warning System more meaningful. It would entail a limited financial outlay by the international community.

559. At present the international agencies, and particularly the World Food Programme, do not have sufficient resources to cope adequately even with limited emergency situations. 1/ The establishment of an international Food Reserve for Emergencies of 500 000 tons of cereals, plus appropriate small quantities of dried milk and other food essential for relief operations would enable WFP to increase substantially its relief interventions, which on average amounted to about 80 000 tons a year during 1971-73. A part of the proposed Reserve, say one third to one half, could be prelocated in strategic places; the rest would be on call when required. Criteria for cost sharing would need to be formulated so that all interested governments could take part. Donors of the World Food Programme might offer to share the cost of setting-up and maintaining this reserve in proportion to their World Food Programme pledges; these contributions to the proposed emergency reserve should be separate from the normal annual or biannual pledges to the World Food Programme and there should be rules for regular replenishment of the reserve. It will be necessary to define emergencies which will quality for assistance from the proposed reserve. These details and other various practical matters concerning its operational procedures would need to be carefully considered in the appropriate fora.

560. In the light of the foregoing analysis of the problem of emergencies, the World Food Conference may wish to:

(i) Recommend that an international policy for emergency stocks be developed as an integral part of food security policies to provide for a coordinated system of national emergency stocks to be held, financed, or earmarked by developed countries, on a scale sufficient to meet the large-scale emergency needs of developing countries, including specific provisions relating to the sharing of costs, the conditions of release of such stocks, and their replenishment.

(ii) Recommend that, in order to strengthen multilateral arrangements for dealing with emergencies, an international food reserve of about 500 000 tons should be created with provision for regular replenishment, and for prelocation of a portion of the reserve, and request FAO, in cooperation with the World Food Programme, UN and other organizations to formulate concrete proposals for creating such a reserve.

1/ The amount of World Food Programme resources earmarked for emergencies is, according to its regulations, U.S.$ 7 million a year, plus a possible additional U.S.$ 3 million, but the Intergovernmental Committee for the World Food Programme in practice authorizes larger amounts. An average of U.S.$ 14 million worth was used by the WFP each year in 1966-73 for emergency aid, with a peak of U.S.$ 19 million in 1970.

Chapter 16

Longer-term Policy for Food Aid

561. As discussed in an earlier section of this document, effective policies and programmes to accelerate food production in developing countries can progressively reduce their food deficits; but there will remain several developing countries with millions of people, not in a position to meet their food requirements wholly from domestic production or partially through commercial imports owing to balance of payments constraints. Such chronic deficits could become much more acute during emergency situations arising from crop failure and could pose a grave threat to human lives. In view of this, it is clear that food aid and food transfers on concessional terms from developed to developing countries will continue to be needed at least over the next decade.

562. The main food aid problem that has been highlighted by the recent experience is the instability resulting from the lack of reasonable continuity of food aid availability and supplies. Food aid, which has been a significant component of the total aid flows to developing countries, was drastically cut in 1972/73 and 1973/74. From a maximum of around 16.8 million tons of cereals in 1964/65 (valued at $1 122 million) it declined to an annual average level of around 14 million tons during the five years 1965/66 to 1969/70. Since then, there has been a sharp reduction to 9 million tons in 1972/73 and to an estimated level of less than 7 million tons in 1973/74. Between 1954 and 1969 food aid shipments accounted for between 30 and 45 percent of the total food imports of the developing countries. Some part of the food aid consisted of outright gifts, but a growing proportion took the form of loans in kind or was transferred under long-term credit arrangements, which may generate problems for some countries in the future.

563. The main reasons behind the decline in food aid in recent years have been the low stocks, high prices and relative scarcity of supply of grains in relation to commercial demand. Faced with nearly a three-fold increase in grain prices, many developing countries with difficult balance of payments situations could not afford to purchase the needed foodgrains on commercial terms to meet their full requirements. As a result, with food aid availabilities sharply reduced, food supplies as well as development programmes and projects were adversely affected in a number of food deficit importing countries. In effect, the last two years witnessed a situation in which food aid flows shrank at a time when they were needed the most.

564. At present, the world is confronted with two contradictory forces in regard to food aid. On the one hand, there is general agreement in both the aid-giving and aid-receiving countries that have participated in the past food aid programmes, that food aid has performed a useful role. On the other hand, the present food shortages threaten to cripple food aid programmes beyond repair. Three basic considerations underline the need for continuing food aid at least over the next decade: (i) many developing countries

will remain prone to chronic or emergency food shortages; (ii) several of them will continue to face balance of payments difficulties which will severely limit their capacity to import food on commercial terms and to alleviate inflationary pressures within their economies; and (iii) there will be persisting need to accelerate development through food aid by raising consumption, nutritional and energy levels of vulnerable groups of the population, and by supporting labour-intensive development projects and programmes.

565. Recognizing this need, food aid should be continued in the context of an accepted long-term policy framework within which bilateral and multilateral food aid programmes would operate. Its main objectives could be: (i) providing security against emergencies and food shortages (ii) fighting hunger and malnutrition and (iii) assisting accelerated economic development through labour intensive programmes particularly in the agricultural and rural sectors.

566. From the point of view of several aid-giving countries, providing aid in the form of food has certain advantages inasmuch as its real (or budgetary) cost is often low. Food aid could also indirectly stabilize commercial markets in such conditions. It is therefore necessary for food aid to be continued as a vital component of food security and international development assistance. It is also necessary to agree on the main elements of a long-term food aid policy and on strengthening international cooperation in food aid so as to make food aid programmes, both bilateral and multilateral, more meaningful and effective.

Main Elements of a Long-term Food Aid Policy

567. Governments may wish to consider the following main elements of a long-term food aid policy:

(i) Acceptance of the concept of forward planning of food aid programmes to ensure more effective utilization.

(ii) Assurance of continuity of a minimum level of food aid supplies in physical terms in order to insulate bilateral and multilateral food aid programmes and projects from the disturbing effect of production and adjustment programmes and price fluctuations, as well as to ensure adequate availabilities for an international policy for emergency stocks as proposed in Chapter 15.

(iii) Acceptance of the principle of equitable sharing of responsibility and the cost of food aid between traditional food-exporting and other high-income countries.

(iv) Continued provision of appropriate safeguards, as provided under the FAO Principles of Surplus Disposal, against the possibility of food aid causing disincentives to production in the recipient countries, to normal commercial trade and to the food exporting developing countries.

(v) Declaration of intent to increase progressively the grant component of total food aid so as to limit the repayment burden on aid-receiving countries.

(vi) Creation of a special food aid account from food aid repayments to supplement special nutrition programmes or emergency relief needs, to be administered by the World Food Programme.

(vii) Measures to strengthen international cooperation in food aid to increase the effectiveness of food aid programmes.

568. Forward Planning of Food Aid: with the changed world food situation, particularly the disappearance of surplus stocks and the adoption of policies allowing more effective production controls in major exporting countries, it is necessary to plan for ensuring continuity of food aid by integrating food aid programmes with production and stock policies. Forward planning of food aid has several advantages. On the one hand, it would facilitate programming of domestic food production, exports and stocks as well as give additional planning stability to farmers in the aid-giving countries. Likewise, planned food aid would ensure its more effective utilization through more purposeful project formulation and better dovetailing with the development plans and programmes of the aid-receiving countries. Longer-term planning of food aid would also help the operation and planning of multilateral and voluntary food aid agencies.

569. It is desirable for the aid-giving countries to adopt a common policy of establishing medium-term food aid plans e.g. on a 3-year basis beginning with 1975. These plans would be announced and made known; they would be indicative and not, by themselves, imply binding international commitments, agreements or pledges. Food aid plans would also take into account the changing nature of the requirements of the aid-receiving countries both in respect of the purpose of food aid (e.g. emergencies, nutritional and development), and the commodities required (e.g. increasing need for protein-rich foods as local cereals production develops).

570. Assuring a minimum level of food aid supplies in physical terms: the main reason for the instability in food aid is its dependence on the year-to-year availability of supplies and stocks in aid-giving countries. As a result, in a situation of shortage and high prices, food aid quantities tend to shrink not only because of the reduced supplies but also the increased prices, as the food aid is usually budgeted in monetary terms. On the contrary, the need for food aid is even more urgent in a shortage situation. This creates very difficult problems for effective utilization of food aid by aid-recipient countries. It would minimize the uncertainties and insulate 'hard core' food aid levels from the eroding effect of sudden price rises, if aid-giving countries agreed on the minimum quantities of food

aid that they would give for a three-year period, on a rolling forward basis 1/. To this end, the aid-giving countries may give urgent consideration to:

(a) Agree to provide in physical terms a minimum quantity of food aid of 10 million tons of wheat and coarse grains to take care of "hard core" food aid requirements.

(b) Evolve similar aid arrangements for other food commodities, such as rice, oils and oilseeds and dairy products; food aid levels for these commodities would also be guaranteed in physical terms (Table).

(c) Enlarge the membership of such food aid arrangements to include all major exporting countries and food aid-giving countries, including interested developing countries.

(d) The individual contributions of different aid-giving countries could be agreed through negotiations among these countries; these may be in relation to both the existing international commitments on food aid as well as past and prospective bilateral food aid programmes (Table).

(e) Provide that an agreed minimum share of each individual participating country's food aid programmes is channelled through WFP, with a view to increasing the share of food aid channelled through multilateral agencies.

571. The proposed food aid level of 10 million tons suggested in sub-paragraph (a) should be regarded as an assured minimum and should be compared with the present international commitment for 4 million tons in physical terms in the Food Aid Convention. It implies the acceptance of a lower limit, below which the annual flows would not fall, and which would enable the hard-core requirements for food aid to be met on an assured basis. In practice, total yearly food aid should approach at least the average level of 14-15 million tons attained in the sixties (Table). In years of bad harvests, the need for emergency food aid would be substantially higher, and total food requirements may even exceed 17 million tons, the peak level reached in 1964/65.

572. Role of Multilateral Food Aid: the high prices and shortages which led to a shrinking of bilateral food aid, have affected in a similar way the resources and the operations of the World Food Programme, the international agency for channelling multilateral food aid, as well as many non-

1/ The principle of quantitative commitments for a three-year period (1971-74) is already accepted in the Food Aid Convention for a part - about 4 million tons - of food aid in wheat and coarse grains suitable for human consumption.

governmental organizations 1/. The WFP's activities have increased rapidly since 1963. On the basis of experience WFP's Intergovernmental Committee (IGC) envisaged in 1970 that the Programme could effectively utilize resources of the order of $300 million a year without basic changes in its existing procedures 2/. This figure would rise to well over $600 million at current high food prices. A pre-condition for the envisaged expanded role of WFP was the expectation that adequate pledges would be forthcoming. This expectation, however, has not been borne out by the facts. As early as 1971 the World Food Programme began to feel the pinch of sharply reduced pledges of milk powder and other dairy products owing to a reduction in available supplies. As a result, the WFP had to abandon plans for expanded assistance for nutritional improvement either directly through special feeding projects for vulnerable age groups, or indirectly through the support of national dairy development projects. Combined with this, in the past two years, the spiralling prices of cereals have reduced by more than two thirds the purchasing power of WFP's pledges, which are made in monetary terms. The net effect of this and of rapidly rising freight rates has been a decline of nearly 40 percent in World Food Programme shipments from their peak level of 875 000 tons in 1970 to 525 000 tons in 1973 and an estimated 500 000 tons in 1974.

573. The adverse effect of high commodity prices and freight rates on the Programme's resources has made it necessary to impose severe restrictive measures with a view to fulfilling, as a minimum, firm commitments undertaken prior to 1973. New commitments for 1974 and 1975 have been virtually limited to projects in the least developed countries and to rehabilitation projects in countries which have suffered from natural or man-made disasters or prolonged droughts. Although the resource position of the Programme is likely to improve somewhat in 1975, most of the expected increase in resources is to be used only for extension of successful ongoing projects, whose discontinuance would cause severe hardship in the recipient countries concerned. This has meant the retention of a commitment ceiling of only $100 million for 1975, as against the pipeline requests for food aid totalling over $500 million. It is thus clear that the World Food Programme can make effective us of substantially more resources than it received at the

1/ During 1973/74, the shortage of food has caused a 40 percent reduction in the food programming by CARE, a voluntary organization which has nutrition improvement and technical assistance programmes in 35 countries. There are indications that this trend may continue and perhaps accelerate during 1974/75.

2/ Report on "Food Aid and Related Issues during the Second Development Decade", WFP/IGC: 17/5 Rev. 1, (April 1970), paras. 129-130.

Table 7. Past levels of food aid in cereals and other commodities

	1960/61-1964/65 average	1965/66-1969/70 average	1970/71	1971/72	1972/73	1973/74
	(. . . . . thousand tons . . . . .)					
Wheat	12 959	10 629	9 487	7 985	5 962	5 116
Coarse grains	1 264	1 831	1 164	1 391	1 467	862
Rice	582	921	2 021	2 273	1 550	906
Cereals	14 805	13 381	12 672	11 649	8 979	6 884
Edible oils & oilseeds	392	348	379	380	219	202
Dairy products	318	227	176	141	116	104

Source: FAO

Table 8. Past level of food aid and concessional sales programmes by main countries

	1960/61-1964/65 average	1965/66-1969/70 average	1970/71	1971/72	1972/73	1973/74 3/
	(. . . . . thousand tons . . . . .)					
United States	15 634	12 806	9 425	9 533	6 989	3 475 5/
Argentina	-	10	23	23	23	-
Australia	35	191	226	240	225	196
Canada	179	676	1 608	605	712	243
EEC 4/	1/	561	1 287	1 035	1 256	1 393 5/
Finland	-	6	14	14	14	-
Japan	-	119	729	603	442	258
Sweden	-	22	54	35	35	-
Switzerland	-	15	36	37	32	-
U.S.S.R.	-	40	-	23	-	2 000
Others 2/	-	43	379	577	88	25
TOTAL (all countries)	15 848	14 489	13 781	12 725	9 816	7 590

Source: FAO

1/ Less than 1 000 tons
2/ Including triangular transactions, mostly in rice
3/ Covers only 1 July 1973 up to 31 March 1974
4/ Includes all nine member countries throughout the period covered
5/ Estimate for the full year 1 July 1973 to 30 June 1974.

beginning of the seventies when they reached their peak level. But if this aim or even the more modest objective of regaining the previous high level is to be achieved, it is essential that donor countries assure continuity of food supplies to the Programme, so as to impart the needed planning stability in the level of WFP resources and its operations.

574. The most important justification for channelling a larger share of total food aid through WFP is the success of this Programme in meeting the main objectives of food aid spelled out in paragraph above. Apart from meeting emergency needs to the extent permitted by its resources, WFP provides food directly to those malnourished people outside the market place who need it most, and in return for work which contributes to local development. In this way it plays a role creating additional and gainful employment opportunities without reducing incentives for food production or displacing commercial trade in grains. It would therefore be highly desirable to provide a minimum agreed share of say 20 percent of the proposed annual target of 10 million tons mentioned in paragraph above to the WFP on an assured basis. This proposal would in fact allow for the expansion in real terms to the level envisaged by its Intergovernmental Committee in 1970.

575. Equitable sharing of the cost of food aid: food aid is not an equally preferred form of aid among all high-income countries. Its attractiveness lies mainly in the low real or budgetary cost to food producing and exporting countries that are already committed to expenditures in support of domestic agricultural production, or where grain production has substantial comparative advantage. The bulk of the foreign aid programmes of non-food exporting countries is understandably in the form of finance or technical aid. Nonetheless, the countries which are not food exporters have traditionally shared part of the responsibility and cost of food aid in the World Food Programme and under the Food Aid Convention by contributing convertible currencies, bearing in mind in particular the unique role which food aid plays in meeting emergency situations, mitigating human suffering, and in promoting development and rural employment. Their contributions to food aid have mainly been in the form of cash which can be utilized for: (a) purchasing food from food-exporting developing countries, and thus enabling them also to participate in food aid programmes, e.g. through triangular transactions as presently operating for some commodities such as rice, and (b) meeting ocean transport and insurance costs of food aid shipments.

576. Although the willingness of some of the rich food-importing countries to contribute to food aid has been of the utmost value, it cannot yet be said that the most recent (Table) geographical distribution of food aid donations fully reflects the principle of equitable burden-sharing. In this context the recent initiative of the Commission of the European Communities to improve and expand the food aid policy of the Community is a positive step. The Commission in its Memorandum of 6 March 1974 to the Council of Ministers has suggested that the Community should announce a three

year food aid programme and that the level of annual commitment should be raised, inter alia, to 1.7-2.5 million tons of cereals, 80-120 000 tons of skim milk powder and 45-65 000 tons of butter-oil. Another positive step has been Saudi Arabia's recent contribution of $50 million to the World Food Programme.

577. Indeed a wholly new situation has to be faced. A considerable number of countries may be capable of contributing to the financial cost of food aid and may be willing to do so. But many of these do not possess sufficient unused agricultural potential to produce the tonnages which their financial contributions could procure. In other words, of the countries participating in food aid financing, a larger number in future is likely to be different from those capable of producing the supplies needed. This situation might be handled in various ways. One alternative would be for the government of a donor country, lacking unused agricultural potential, to make purchases of grain and other foodstuffs in the world market, preferably from developing countries with surplus foodgrains. Another alternative would be for the country to donate cash to the World Food Programme which itself would make purchases in the market, as it has done on a modest scale hitherto.

578. Safeguards against disincentives: past experience has highlighted the need for safeguards to make food aid more effective in achieving its main objectives and at the same time avoiding any disincentive effect on (i) food production in recipient countries, (ii) normal commercial trade and (iii) trade and production of food exporting developing countries. Since one of the important aims of development through food aid is that adequate food supplies should become eventually available from domestic production, the long-term food aid policy should in no case act as a discentive to food production in the recipient countries. On the contrary, food aid should be used, to the maximum extent feasible, for strengthening the agricultural production base in aid-receiving countries, and thereby also increasing local food production. To this end, steps should be taken to ensure that agricultural development plans receive due priority and that returns to local food producers are maintained at reasonable levels. The means to achieve this could include linking food aid programmes with support price policies and price stabilization programmes in aid-receiving countries; ensuring that amounts of food aid supplied bear a reasonable ratio to production and consumption requirements of the recipient countries; and stipulating that food supplies received through aid would normally be channelled directly to consumers through authorized retail outlets such as fair price shops. Further, the recipient countries should utilize food aid to the maximum extent possible for strengthening the income, employment and consumption of small farmers and of landless people by undertaking specific measures and programmes.

579. As regards possible displacement of normal commercial trade as a result of food aid, this danger would be minimized if all aid-giving and aid-receiving countries adhered to the FAO Principles of Surplus Disposal. This should also ensure the avoidance of harmful effects on the food exporting developing countries. Further, promotion of 'triangular transactions' as discussed in paragraph above and in paragraph below as well as in Chapter 18 would enable developing exporters to participate in food aid, and thereby provide the necessary stability to their food producers as well as to their production plans.

580. Increasing the grant component of food aid: the terms on which food aid is made available range from outright grants to long-term foreign currency credits at low interest rates, depending on the policy of aid-giving countries, the purpose of food aid, the stage of economic development of the aid-receiving countries (e.g. least-developed). These variations in terms would presumably continue in future as well. However, in view of the growing debt burden of some of the developing countries, it would be desirable if food aid-giving countries progressively increased the grant component of total food aid, particularly for poor, vulnerable and least developed countries, as well as for emergency aid and for all project aid, including nutritional projects.

581. Food Aid Special Account: it is realistic to assume that long-term food loans in kind and the food aid on long-term foreign currency credits (e.g. a considerable part of food aid given by the United States and Japan) will continue in future. Such transactions would eventually necessitate a reverse transfer of food or financial resources from developing to developed countries. To mitigate the effects of this, food aid-giving countries should consider crediting an agreed share of repayments in foreign exchange to a Food Aid Special Account. This would create a fund which could be used for supplementing special nutrition programmes and emergency relief. Such a fund would impart a greater degree of stability and continuity to nutrition programmes in general and would increase resources for emergency relief 1/. Voluntary cash contributions to the Account would preferably be utilized for purchases of food for aid purposes from food exporting developing countries. The operational management might be entrusted to the existing multilateral agency, namely the World Food Programme, under the supervision and guidance of the IGC.

1/ As long-term food aid transactions involving repayments usually have a grace period of several years and a long span of repayments, the amounts that would be available for the proposed Food Aid Account would be on only a modest scale in its early years.

582. Improved international cooperation: thus far there has been only limited international coordination of food aid programmes. But the need becomes evident when a number of countries are operating sizeable bilateral and multilateral food aid programmes concurrently with the World Food Programme. To ensure smooth forward planning, there might need to be intergovernmental consultation concerning the likely requirements of food aid, the expected availabilities and on food aid policies in general. Such intergovernmental consultations would be open to all interested governments, both aid-giving and aid-receiving, and the main functions would include:

(a) consultations on national and international food aid programmes and policies with particular reference to possibilities of securing closer interrelationship between bilateral and multilateral aid;

(b) periodic reviews of general trends in food aid requirements and food aid availabilities;

(c) recommendations to governments, including advice on continuity of food aid programmes, food aid requirements, composition of food aid and other related questions;

(d) advice on the functioning of the proposed Food Aid Special Account.

583. In the light of the foregoing considerations and requirements, the World Food Conference may wish to:

(i) Stress the need for a long-term food aid policy as an essential element in world food security as a means of improving nutrition and as a useful component of international development assistance;

(ii) Recommend that donor countries accept and implement the concept of forward planning of food aid preferably on a three year basis and agree to provide, in physical terms, at least 10 million tons of wheat and coarse grains as food aid every year and to evolve supplementary arrangements for other food commodities, such as rice, oils and oilseeds and dairy products;

(iii) Request donor governments to channel an agreed minimum share of their food aid programme through World Food Programme and increase progressively the grant component in their bilateral food aid programmes and contribute part of any food aid repayments to a Special Food Aid Account for supplementary special nutrition programmes and emergency relief;

(iv) Request FAO, in cooperation with the World Food Programme and other organizations concerned, to formulate proposals for more effective coordination of bilateral and multilateral food aid programmes.

Section IV

TRADE, STABILITY AND ADJUSTMENT

Section IV

TRADE, STABILITY AND ADJUSTMENT

584. Proposals concerning trade, stability and adjustment tend to have a somewhat different character from those directed to production. They must deal with the principles or elements of a more harmonized approach to integrating national food economies with the world markets. Export trade is an important outlet for many foods and about a tenth of the value of the world's food, feed and beverages is traded internationally. For all cereals taken together about one eighth of the world's consumption comes from imports and the proportion is much higher for many products, e.g. in recent years 15-20 percent for wheat, around 30 percent for sugar and somewhat higher for fats and oils, while the shares are markedly larger for tropical beverages and fruits. Trade in food, feed and some fisheries products in 1973 amounted to some $70 000 million and constituted about 75 percent of world agricultural trade and about 15 percent of total merchandise trade.

585. Thus food issues cannot be considered in isolation from trade. The interdependence is too important, directly and indirectly. The solution of the world food problem requires, above all, an expansion of production in the developing countries. However, it cannot be expected that all these or other importing countries could be or should become fully self-sufficient. If they tried to become so, there would be an uneconomic use of resources which are or can be used more productively in other sectors of the economy. There would not be the important flexibility which comes through using imports or exports as the chief means of balancing fairly stable trends in domestic requirements with inherently fluctuating domestic production. Many food exporting countries, including some which are dependent on food exports for their foreign exchange, both developed and developing, would find their foreign earnings, and hence their potential for social and economic betterment, sharply cut in a universal regime of national self-sufficiency. The quality and variety of diets would be far poorer without access to imports. Perhaps most critical of all, it is only through a substantial trade in food and production requisites that a more rational use can be made of the varying resource endowments of countries in future decades when the pressures on world resources for food production will be so much stronger. In sum, the contribution of an expanding trade in food is an essential and increasingly strategic element in improving the world food situation.

586. In what follows, an attempt has been made to focus the discussions and suggestions to aspects closely related to improving the food situation through trade. Some of these matters are already under consideration in bodies like GATT and UNCTAD. At the same time, discussion of relevant trade questions dealt with here could impart to trade negotiations elsewhere an orientation which can come only from considering food trade issues in their widest social and political context, i.e. as a basic element

of the world food problem including the existence of hundreds of millions of underfed people. The range of issues involved is very broad. Starting from the requirements for minimum world food security, as discussed in the preceding section of this document, action geared to the food trade problems of different groups of countries must then be considered. The various possible measures will, in turn, need to be part of improvements designed to bring about a greater measure of stability and predictability in world food trade. Such action, however, cannot stop at the level of trade alone but must include provision for facilitating a better dynamic adjustment between production and demand, taking account of other goals accepted by governments such as those of successive UN Development Decades and other relevant international decisions. Past efforts in these directions have had patchy results but the force of events - reflected also in the very decision to hold the World Food Conference - increasingly requires practical steps to be taken toward more of a "one-world" view of food issues.

587. Against such a background the Conference may wish to consider specific objectives and measures in the area of international trade and adjustment which are relevant to the food problem, including measures toward stabilization and expansion of markets for exports from developing countries:

(i) Problems and prospects of stabilizing food prices;

(ii) Broad policy issues arising from the problems of food importing developing countries which need larger exports and assistance to be able to finance their required imports of food, and of food exporting countries which need a fair share of the world trade in food and food products;

(iii) Greater international cooperation for agricultural adjustment.

Chapter 17

Stabilization of Food Prices and Markets

588. Instability in world agricultural markets reflected in excessive fluctuations of prices and also by the uncertainty which surrounds the availability of agricultural products in world markets has been a recurrent problem. The current phase of instability is one of the worst ever experienced in recent history. Enhancing the stability of markets is a necessary step toward the establishment of an orderly trading system in which both importers and exporters can take advantage of trade for their internal development. Though some countries may temporarily gain from exceptional price increases, these are usually shortlived windfalls and do not provide an adequate basis for production planning. In the same way, low prices have attraction for consumers but they could lead to shortages and high prices at a later date if they weaken incentives for producers.

589. The appropriate mechanism for the control of price and market instability will depend on (a) the nature of the product concerned (b) the degree of stability required, and (c) the causes of instability. These are several causes of instability: fluctuations in production, variations in the level of demand, and the technical lags in production of many agricultural goods in response to price changes, which result in supply changes inappropriate to current market conditions, and monetary problems or fluctuations in currency rates. The most direct way to deal with instability is to eliminate or reduce as far as possible these causes of price fluctuation.

590. Many of the proposals of the Conference will help to reduce fluctuations in production, though in some instances increases in productivity may be associated with greater variability in yield. The improvement of trading possibilities, together with more general cooperation on international economic matters, will have the effect of reducing much of the instability of import demand. The development of food processing industries in developing countries is of particular significance in this regard. Similarly, the improvement of information systems, both at the producer level and among governments, will make it easier to cope with the third cause of instability. The development of longer-term forward contracts, both between private traders and between governments, can assist in improving the reliability of price expectations for the parties to such contracts, though possibly at the expense of accentuating fluctuations in the spot market. However, it is very likely that markets for a number of commodities will remain excessively unstable in spite of these developments.

591. Absolute price stability is neither possible nor of itself desirable in a situation where price has to play the role of reflecting or influencing relative demand and availability. Equally, undue price fluctua-

tions indicate that the market is not operating satisfactorily. Individual countries can and do take action to ensure a greater degree of stability on domestic markets. Some countries hold stocks of foodstuffs which can be managed in such a way as to enhance domestic price stability. Others have to provide various forms of subsidies. Action is often taken also by means of flexible import restrictions or export aids, or price control in the market for food. Other stabilization instruments are available in the form of bilateral or regional trade agreements.

592. The problem for the international community, however, is that stabilization of a limited part of a global market may lead to greater instability in those parts of the market excluded from the stabilization arrangement. To the extent that many developing countries depend on the "free" part of otherwise managed markets, both for export outlets and for imported supplies, this presents a serious problem. Hence a reasonable level of stability in the world or "free" markets for all food commodities would be a desirable aim of international policy.

593. The world market for cereals holds the key to any measure designed to control fluctuations in the prices of basic foodstuffs. Of the markets for the different cereals, that for wheat is the most significant in this regard, though stability in the market for rice and feedgrains is also of great importance. The inter-linking of these markets must be acknowledged in any stabilization policy. Any action taken on the storage and marketing of wheat, for instance, must take into account developments in the markets for other grains. This would in turn reduce the size of reserves needed for each particular grain.

594. Recent experience has emphasized the crucial link between the holding of adequate stocks and the stability of markets. The relative stability in the markets and prices of grains for almost two decades was due largely to the grain stocks and stockholding policies of North America. These stocks have now disappeared and, as discussed in Section III, a critical question before the Conference is to find some way to re-establish the security that these stocks previously provided. Although an increase in stock levels is needed for emergency relief, food aid and world security, the requirement for stabilization is not for an indiscriminate increase in the levels of stocks per se, but rather the international management of stocks in such a way as to avoid unwarranted increases or decreases in world prices. It may be noted in this connexion that previous attempts at regulating world prices of wheat have been weakened by the absence of a clearly defined link between stock accumulation and price behaviour. Moreover, the uneven distribution of stocks has put an undue burden on a few countries to try to maintain prices within the limits which have been set.

595. It has already been recognized by the governments participating in the preparation of the draft International Undertaking on World Food Security that coordinated national stockholding for security,

while providing the means whereby prices could be prevented from rising unduly, might also in certain circumstances push prices too far downward. Paragraph 8(b) of the draft Undertaking therefore states that governments should "consider measures designed to afford producers adequate protection against the effects on world prices of accumulation, retention and release of stocks held as a result of the Undertaking".

596. This inevitable link between stocks and prices raises different kinds of problems for different governments. If national stocks become too "large" in a particular year and prices begin to fall, governments of main grain exporting countries might be forced to adopt adjustment measures to reduce production and to protect farm incomes from falling. But if such measures were to be adopted before the world as a whole had built up adequate security stocks, it could expose the main importing countries to dangers of serious shortages and very high prices in case of crop failures in subsequent years. At the same time, however, the exporting countries cannot be expected to carry the entire burden of security stocks and also suffer any depressing effect on prices which might be created by large stocks. The dilemma created by this inherent conflict between what could be regarded as legitimate national objectives of many governments and the international requirements for food security and price stability cannot be resolved without some agreed international approach for sharing the burden of security stocks on an equitable basis and for stabilizing grain prices within agreed limits.

597. In the light of these considerations, the governments might wish to consider as the next logical step the possibility of evolving the proposed food security system into an arrangement that could be used to dampen price fluctuations, in addition to ensuring adequate supplies. The use of stocks in this way would not interfere with world trade in grains in periods when supplies were normal and national stocks adequate for future contingencies. Obviously a great deal of technical examination and discussion would be needed, in the appropriate fora, in order to see how stocks could be used both for food security and for stabilization, and it would seem worthwhile to get the food security aspect working in the meanwhile.

598. Governments might therefore consider adding to the proposed system of world food security based on the coordinated holding of national stocks some additional elements which would permit the use of these stocks to prevent or modify unduly large price changes. The main elements of a possible stabilization arrangement on grains, consistent with the food security system, i.e. based on the principle of coordinated national stock policies, would seem to be as follows:

(a) A price range would be established by agreement within which there would be no obligation on governments to adjust their own stock policies. The price range over which the market would be allowed to operate without coordinated stock intervention or disposal would be that which would

encourage the desired level of production to meet foreseeable needs. This price range would be subject to review from time to time and would be revised to take into account changes in costs and in demand in relation to other products, according to pre-determined criteria.

(b) The main mechanism which would be used to defend the price range would be an agreed set of rules on stock management which would operate according to two criteria: the current movement of world prices, and the anticipated development of the level of supply. A set of price "triggers" would indicate action to be taken by the responsible authorities, taking into account market prospects. All countries with an interest in the grain market would be expected to conform to the rules of management of stocks and to bear an agreed share of the costs of implementing such a scheme.

(c) The broad principles of the stabilization scheme would be subject to review and modification by participating countries on a regular basis, and could include measures to link the stabilization scheme with the food aid policies of participating countries and with consultations on agricultural adjustment to achieve a longer-term balance between demand and supply when necessary.

599. Stockholding for the purpose of market stabilization could form the basis of a new approach to international grains arrangements, including a new international wheat agreement, supported by more limited arrangements for rice and coarse grains. Such an agreement would be able to influence world prices through holding and regulation of stocks designed to maintain world prices in a given range, which would be wide enough to allow underlying market forces to operate freely and to manifest themselves through limited movements in prices. Provision would be made, moreover, for periodic adjustments to the price range under agreed rules and in the light of changes in the trends of demand and supply indicated by these market forces. Successful operation of such a scheme could be of particular benefit to both exporting and importing developing countries, by providing greater assurance to the former that they would be able to dispose of their surpluses at remunerative prices, while protecting the latter countries from undue fluctuations in the cost of their essential food imports and hence from undue strain on their balances of payments. The need for such protection for food-importing and exporting developing countries was recognized in the Programme of Action adopted by the UN General Assembly at its Sixth Special Session in April/May 1974 1/.

1/ General Assembly Resolution A/RES/3202 (S-VI), Chapter 1, para.2(f) and para. 3(a)(xi).

600. The actual size of the stocks that would need to be maintained under such an arrangement will depend on the width of the range within which prices would be permitted to fluctuate. An essential element for the successful operation of the arrangement will be the willingness of the participating governments to observe the "rules of the game" and, particularly, the successful resolution of any conflicts between national policies and interests and the international obligations under the arrangement. Equally important for the success of such a stabilization scheme is the realism of the agreed price range. Provision would obviously have to be made for periodic adjustments to the price range under agreed rules and in the light of changes in the trends in demand and supply as indicated by market forces.

601. The integration of food security and price stabilization based on coordinated national stocks along the above lines, if administered according to an agreed set of rules, could go a long way in achieving the objectives of market stability.

602. In making this proposal it is recognized that there are other possible techniques of international action aimed at price stabilization, including in particular the multilateral contracts with purchase and supply commitment provisions at agreed minimum and maximum prices respectively, the use of export or sales quotas, and international buffer stocks. The proposal has been made in the light of the objectives and considerations stated in paragraphs 7 to 10 above.

603. It has to be recognized, however, that under conditions of substantial surpluses or scarcities, the proposed arrangements might be subjected to considerable strain. The desirability and feasibility of strengthening and reinforcing the proposed arrangements by an international buffer stock needs to be considered. A complementary international buffer stock of this type would be substantially smaller than the one which had to carry the entire burden of stabilizing world prices.

604. It should be noted that the cost of stabilizing a unified world market through arrangements proposed above would be much less than the aggregate cost of stabilizing national markets independently. According to rough estimates made by UNCTAD, based on the fluctuations in cereal production in 1961-72, the aggregate size of the nationally-held stocks to stabilize cereal markets, independently of one another, would be substantially larger than the size of the stock which would be required under an internationally-agreed arrangement. The establishment of an international system, moreover, would facilitate an equitable sharing of the costs of stockholding.

605. The proposed arrangements are particularly focussed on wheat but could include appropriate provisions for selected coarse grains and rice. The problems of rice are complex, not only because only about 4 percent of total world production of rice is traded, but also because of the existence of a large number of varieties and marked consumer preferences

for certain varieties. The object of achieving greater stability in the price of rice would, therefore need to be pursued by action along several complementary lines, e.g. negotiation of longer-term bilateral contracts, and better harmonization of national production and trade policies. The Guidelines on National Production, Trade and Aid Policies, already accepted by governments in the forum of the FAO Intergovernmental Group on Rice, have provided a useful international framework within which national rice policies could be operated.

606. The stabilization of coarse grains markets is complicated by the interrelationship among the various coarse grains and also between the coarse grains as a group and other feedstuffs. If stabilization stocks for coarse grains were created, it might be possible to limit them to maize and barley which should stabilize markets of coarse grains as a whole, while leaving room for fluctuations in relation to prices of other grains or feedstuffs.

Some Other Food Products

607. Sugar is of great interest to many developing countries as exporters or as importers. Previous stabilization arrangements for sugar have been partially successful in the past and have now broken down. Many recent developments including continuous buoyant demand for sugar have created conditions in which there is urgent need for increasing production and for effective stabilization arrangements. It is probable that recent changes in major sugar importing areas have significantly enhanced the opportunity for effective action in both these directions.

608. The problems of stabilizing prices of food products which cannot be stored (like meat, tea and fruits) or those for which the costs of storage are excessively high (like dairy products and vegetable oils) are more complex. For such products, greater price stability might be achieved through international agreements providing for regulation of production or supply. Alternatively, some degree of stabilization for individual exporting countries might be achieved through contractual arrangements providing for the guaranteed purchase of minimum quantities at minimum prices, or through price compensation arrangements. Processing of perishable products like fruits could provide an important means of evening out fluctuations in supply and thereby introducing an element of stability in their markets.

609. Individual countries exporting or importing non-storable food products might also be able to protect themselves against unexpected price fluctuations through a greater use of the practice of forward contracting. Such contracts would have to incorporate a degree of flexibility on terms, particularly in respect of prices.

Proposals For Action

610. Considering the paramount need for greater stability in markets and prices of food commodities, particularly cereals, the World Food Conference should:

(i) Affirm the importance of attaining greater market stability in agricultural trade and the necessity of intergovernmental cooperation in avoiding undue fluctuations in the prices of basic foodstuffs;

(ii) Stress the particularly urgent need to establish effective international arrangements for basic cereals, to provide for market stability within a framework of trade expansion and agree on the main lines of an approach to possible international arrangement on grains for consideration and further action by governments in the appropriate fora; keeping in view the relevant recommendations of the Programme of Action adopted by the UN General Assembly at its Sixth Special Session in April/May 1974.

(iii) Emphasize that the proposed stabilization arrangements should give particular attention to the special needs of developing countries as importers and exporters.

Chapter 18

Expansion of Markets for Exports from Developing Countries

611. In the decade of the fifties the developing countries as a group produced the bulk of the cereals consumed by them and imported only small quantities - averaging about 10 to 12 million tons of cereals a year. In the sixties, the demand for food in these countries increased at a rate faster than their domestic production, and their dependence on imports increased. Their average annual imports of cereals rose to about 30 million tons in 1972, about one third financed by food aid. The assessment of the food outlook for the future clearly highlights the fact that a continuation of these trends of demand and supply could further increase the dependence of developing countries on food imports to an unbearable degree. A viable long-term solution of this problem would require greater attention to the population problem, and a comprehensive programme to increase food production in developing countries as already presented in the first section of this document. While efforts in these two directions have to be intensified, there will be countries or regions which would find it difficult or impracticable to close their entire food gaps. The proposed longer-term food aid policy discussed in Chapter 16, if accepted, could cover a part of the uncovered gap. The remaining gap can be filled only if the countries concerned have the foreign exchange required to import a larger quantity of food.

612. For many developing countries there will continue to be no practical alternative to expanding their agricultural exports as part of their drive for foreign exchange earnings. They will have to decide, after weighing all the factors, whether to produce more food for domestic consumption or to accelerate food and other agricultural exports in order to be able, inter alia, to import other kinds of food. Nevertheless, the value of cereal imports will till represent a heavy burden for many developing countries, especially in the context of slowly growing demand on the world market for most agricultural products.

613. Some other developing exporting countries could have sufficient supplies available to permit a substantial increase in their exports to other countries. Such increased exports to markets in developing countries would in a number of cases require appropriate financing arrangements.

614. Indications are that if production potentialities in both developed and developing countries are realized more vigorously, there will be strong competition between suppliers. Since for most competing products the developing countries are the weaker suppliers, it will be to their advantage if practical arrangements for the more orderly growth of trade can be taken further. This may be equally sought by many developed countries, both exporters and importers, who also have a keen self-interest in an improvement in the conditions of trade in food and who wish to pursue the

logic inherent in a degree of cooperation amongst countries as regards food stocks. There is, however, no evidence that less reliance will be placed on the mechanisms of the market for trade in food; rather the wish is to evolve the framework within which markets operate so as to improve their functions of distributing supplies and providing signals for future production.

615. In sum, despite the basic orientation of most national policies toward greater food self-sufficiency, the various advantages and imperatives of trade seem likely to result in world food trade continuing to expand. Developing countries might need larger imports but with appropriate policies their global exports could grow more than their imports.

Policy Issues Arising from the Basic Food Situation of Developing Countries

616. Whatever may be the general prospects for trade in food, the choice of a strategy to link production and trade most effectively lies with individual governments. The issues facing governments when they make this choice vary greatly from country to country but fundamentally they reflect the extent to which the country is self-sufficient in basic foods and whether trade in these foods uses or provides a large proportion of their total export earnings. However, developing countries would not be able to adopt appropriate policies for production and trade unless the international market offered proper conditions to absorb their export surpluses.

617. Using cereals as an indicator of basic foods (a reasonable simplification for developing countries where cereals provide around 57 percent of calories) the following table distinguishes three groups of developing countries:

Table 9 - Population of developing countries grouped according to food trade structure, 1972 and 1985

	POPULATION			
	1972		1985	
	million	percent	million	percent
Group I:				
Countries with basic food problem which will require continuing imports	739	40.5	1 032	39.3
Group II:				
Countries nearly self-sufficient in food and/or spending a low share of export earnings on food imports	765	41.8	1 110	42.3
Group III:				
Food exporting countries	325	17.8	481	18.4
Total Developing Market Economy Countries	1 829	100.0	2 623	100.0

Note:

Four countries included in Group I for 1972 (bringing their total number to 20 in that year) are expected to become at least self-sufficient in the future and have accordingly been put into Group II for 1985. Their total population amounted to about 13 million in 1972, rising to about 19 million in 1985.

The first group has structural food problems since the economy generates neither enough basic foods nor enough foreign earnings; the second group consists of countries which are largely self-sufficient either physically or economically as regards basic foods; the third group is made up of those countries with an export surplus of basic foods. The first half of the table relates to the current or recent position and the second half, based on the studies of production possibilities, to assessments of possible situations in years centred on 1985 if an intensive effort is made to increase food output. There are always a few countries which are on the boundaries between groups. The table therefore indicates only broad orders of magnitude of countries in different food and trade situations.

Countries with a Structural Food Problem

618. In the first group with structural food problems fall many African and Asian countries with poor resource endowments. In all these countries basic food production lags behind the growth of consumption, their vulnerability to natural disasters is high, they are mostly among the least developed of the developing countries, they spend a high fraction of their export earnings on imported food, particularly cereals, and they export mainly agricultural products. An examination of their trade structure shows that they export only a limited range of products, particularly coffee, groundnuts, sugar, livestock products, jute and cotton. Most depend heavily on only one of these commodities. The situation of India is rather different as it has many of the characteristics of a country with a basic food problem but which, given its size and the diversity of its export structure, has a different set of foreign trade problems covering manufactures as well as agricultural export products such as tea, coir, tobacco and oilseeds.

619. The trade issue confronting the countries with a structural food problem is largely a question of securing and enlarging their export base. Assistance in improving production, marketing and distribution of export products, while maintaining a balance with the expansion of their food production, would appear to be the key policy measure for this group of countries. Buoyant world markets exist in sugar, oilseeds, oils and cakes, livestock products and wine but are of only limited use to them unless they can take advantage by having suitable supplies of the right quantity available at the right time. Diversification of their export base, where economically justified, would help reduce their vulnerability to the vagaries of the international markets for their products. They therefore have an interest in the orderly expansion of world trade in their export commodities and preferential treatment from their developed trading partners. In a number of cases viability demands that the size of their economies be enlarged by integration or close cooperation with neighbouring countries. They are the countries likely to need food aid for a considerable period of time.

620. A number of measures to help this group of developing countries to earn more foreign exchange, essentially from a limited range of agricultural commodity exports, can be suggested to help to pay for larger food imports. Helping with replanting programmes for sugar, improving the production of oilseeds, development of the Sahelian and East African livestock sector (particularly examining the prospect for rearing sheep), raising the productivity of jute and reducing costs of production, marketing and distribution of cotton might well be considered as among the areas for special production assistance to these developing countries. Other instances could include help with marketing promotion activities and technical assistance in improving the quality of exports, as in the case of wine. Similarly, assistance in introducing new varieties of citrus and measures to adapt the quality of tobacco through research, technical advice on its processing, and help in marketing could also benefit certain countries.

621. Many such measures to expand the market for agricultural exports have been discussed in international fora. In addition, there are tariff barriers whose removal or reduction would offer possibilities for expanded trade in agricultural products. Two of the commodities which, from their point of view, interest those developing countries with basic food problems and limited exports are groundnuts and some other oilseeds, and jute. For both, a problem lies in the effective protection afforded the processing industries in importing countries by low tariffs on the raw material but higher tariffs on the processed product. While liberalization of this trade is desirable, special measures would be needed to protect the interests of the developing countries which now receive preferences from developed country importers and which would be put at a disadvantage by a general liberalization. Also, the relaxation on jute goods imports if too suddenly effected, might stimulate the industry in developed countries to switch more rapidly to synthetics and thus adversely affect the overall market for jute, because the jute industry in developed countries holds most of the marketing and distribution channels.

622. For other commodities, the situation is more complex, given the variety of barriers in existence. For the hardest pressed developing countries the main items of interest are probably the protected sugar production in many importing countries and the consumption taxes on certain tropical products which lower imports somewhat. At the present time world market prices of sugar have overtaken the support levels in developed countries, so that the moment has arrived for an arrangement by which a re-imposition of the protection is avoided or at least minimized. As to meat, potentially many of those hardest hit countries (especially in Africa), along with better established exporters, have an interest in international efforts aimed at resolving the trade problems arising from non-tariff barriers, including veterinary and animal health regulations.

623. Another form of selective help to those countries with a structural food problem but with a limited export base is the granting of preferences to products of special interest to them. Some of these most hard pressed countries already obtain preferences and would benefit much more if they had more products to sell.

624. Another but less direct approach to improving trade opportunities is to stimulate consumption of the product in importing countries. To this end export promotion, whether jointly carried out by several countries (for example wool) or by individual countries (as in the case of tea), can play a useful role. More important perhaps is the sponsoring of research into new end uses for agricultural raw materials and in the possibilities of new crops. Export promotion and consumer research are expensive and, as they tend to be useful to all exporters of the products rather than the individual country, such steps need to be taken cooperatively.

625. The problems of some of these commodities, of special interest to this group of countries, have recently been examined in detail in the course of a series of intensive intergovernmental consultations on

selected commodities in pursuance of the UNCTAD Resolution 83(III) and a number of possible approaches to solutions have been identified. Some of these recommendations could be taken up in the appropriate fora for consideration or implementation in the context of assisting countries facing a longer-term food problem.

Countries which can Manage their Food Problems

626. The second group of developing countries, those roughly self-sufficient in cereals or with an adequate foreign earnings base to afford sufficient imports, comprise a wide range of countries with diverse interests in trade. The common feature, however, is that these interests in agricultural trade need not be oriented predominantly to helping to overcome an urgent structural food problem. These countries can take a long-term view as to the choice of strategy between growing more food or a wider variety of food at home and concentrating on the export of those agricultural products where their competitive strength is greatest. To the extent that the costs of basic food imports amount to only a limited proportion of their total export earnings, their interest in food trade lies mainly in assurance of a regular supply of food items at fair and stable prices. For a number of these countries the imports are not only food cereals but also higher quality foods and feedingstuffs.

627. Insofar as the trade problems of these countries lie in improving the export conditions for minerals and industrial goods, they do not directly concern the World Food Conference. The export of agricultural products, however, has a more direct bearing on their food situation. This is because agricultural export products compete directly for scarce resources particularly land, with the basic food sector. Examples such as the competition for land between cotton and grains in Egypt and parts of Central America are well known. A great many of the developing countries which import cereals, vegetable oils and some livestock products are exporters of sugar - a significant export for at least 35-40 developing countries - beverages, bananas and other tropical fruit. Their export trade interests as derived from their food situation are thus very directly concerned with ways to attain the growth and stability of the world market for their exports and a greater predictability as to future supplies and prices in the world markets as a basis for determining their long-term domestic food/agricultural export strategy.

Problems of Cereal Exporting Countries

628. The third group of developing countries, the cereal exporters, do not have a structural food problem in the strict sense of the term, even though nutritional standards in some of these countries may not be adequate and they have to decide whether or not to divert supplies from

external to domestic markets. A major concern of these developing countries is the expansion and stability of world markets for cereals and other agricultural exports. This is linked to their domestic food problems through the contribution of exports to the general development of their economies and hence the raising of domestic purchasing power, which is the only permanent solution to hunger and malnutrition. The assessment of production possibilities reported earlier concluded that gross cereal export availabilities of developing countries could be raised substantially from 17 million tons to reach some 27 million tons by 1980 and 34 million by 1985, in the sense of trend values for those years. Access to markets, including the possibility of arrangements to facilitate imports by deficit developing countries, together with the stability and growth of world markets, must therefore be central to their food trade interests. As recognized in the Programme of Action on the Establishment of a new Economic Order, of special importance to these countries would be efforts "to promote exports of food products of developing countries through just and equitable arrangements, inter alia, by the progressive elimination of such protective and other measures as constitute unfair competition".

629. An important proposal, in this context, concerns the use of cash resources available to the World Food Programme or any other bilateral or multilateral food aid donor, for purchases in developing exporting countries, if possible on a preferential basis. In the past, the cash component of food aid has been small and was used largely for transport and other administrative expenses. But the recent contribution of $50 million by Saudi Arabia to the World Food Programme for the years 1975-76 and possibilities of similar contributions by other countries which are not food exporters lend strength to the prospect that in future a more sizeable portion of the resources available to the WFP would be in cash. The use of these resources primarily for buying supplies available from developing countries could greatly relieve the problems of those developing food exporting countries which compete only with difficulty with traditional cereal exporters. Such a triangular mechanism could also facilitate the entry into the world grains trade of potential new exporters which, having attained self-sufficiency in food and having built up national stocks, can sustain their food production efforts only if they can dispose of additional output in the world markets.

Balance of Payments and Financial Arrangements

630. The balance of payments of developing countries may come under pressure from their involvement in the food trade in several different circumstances which give rise to the need for assistance. The first and most familiar are fluctuations in export earnings or import payments resulting from violent changes in prices of food on international markets. Stabilization arrangements referred to already could, if evolved, go a long way toward moderating these fluctuations. But the protection

will not be complete, since some commodities will not be covered, or imbalances between supply and demand may be too powerful for prices to remain within the agreed limits. There will consequently be need for special assistance. The facilities provided by the International Monetary Fund (IMF) for compensatory financing of export fluctuations is the major form of assistance at present available; the EEC has also made proposals to stabilize export earnings of developing countries from specific products. Efforts to moderate fluctuations through establishing buffer stocks as part of a commodity agreement may themselves put a strain on the balance of payments since the building up of stocks involves a postponement of the receipt of income. The central idea of these schemes is to stabilize current export earnings and so they offer a complementary approach to action to stabilize prices.

631. What appears to be needed now is greater use of these facilities, on easier terms, and the introduction of new arrangements which serve to raise the level of export earnings or to reduce the burden of external payments.

632. The recent sudden and strong upsurge in the prices of food, fertilizers and petroleum has created serious balance of payments difficulties for a number of developing countries, particularly those with already weak foreign exchange earnings positions, and imperilled their efforts to accelerate food production. In order to alleviate the burden, at least for the hardest hit countries, the Special Session of the General Assembly of the United Nations on raw materials decided to institute a special programme in the context of the Action Programme for the establishing of a New International Economic Order. The special programme includes the setting up of a fund for financing, inter alia, excessive import costs. To the extent that the fund receives sufficiently large financial contributions it will be of great importance in overcoming the immediate difficulties.

633. However, over time the world economy will adapt itself to the new price levels and it is likely that interest in providing special financial measures to meet the after-effects of the current crisis will wane. This could be serious because the total import bill of many developing countries for production requisites or import of basic foods will grow rather than decline. The logical course could, therefore, be to try to introduce more permanent arrangements to alleviate the burden of food in the balance of payments of developing countries.

634. Such an innovation could take at least two forms. One would be the provision of regular contributions to be used to help finance additional shipments of basic foods from developing exporting to selected developing importing countries. This could be done both through the WFP purchases of supplies for food aid already suggested in the earlier portion of this chapter and, in controlled conditions, for lowering the price paid by the importing countries for products such as cereals and vegetable oils. The scheme could be directed particularly, but not exclusively, to the most

hard-pressed countries. The second form would be to put on a more permanent basis the fund now being set up following the recent special session of the General Assembly to finance, inter alia, excessive import costs faced by developing countries. Part of this fund could be earmarked exclusively for assistance to the balance of payments on account of the imports of basic foods or their production requisites.

635. To sum up, the set of food trade issues confronting each group of countries is partly distinct and partly common. Broadly speaking, the countries facing a structural food problem need help to expand their export base and some will continue to need food aid for some time yet; those which are roughly self-sufficient in basic foods or have adequate export bases for the purchase of food imports have a major interest in greater assurance of the stability and growth of food supplies available in world agricultural markets in general; while those with a large agricultural export sector require expansion of their trading possibilities at remunerative prices, including exports to other developing countries. The balance of payments problem of developing countries arising from violent fluctuations in commodity prices would also need greater attention.

636. The World Food Conference, recognizing the urgent need for concrete measures and programmes that will substantially improve the conditions of trade of the developing countries in international commerce, and will allow for their economic and social development needs, may wish to:

(i) Request UNCTAD and other agencies concerned to intensify their efforts in the field of access to markets and pricing policies with a view to rectifying and achieving satisfactory terms of trade of developing countries with developed countries with particular reference to trade in food and food products;

(ii) Request all governments, particularly in the context of the Multilateral Trade Negotiations of GATT, to give priority to the elimination of all restrictions in international commerce which unduly impede the growth of trade, especially of food products, of the developing countries with the rest of the world;

(iii) Emphasize the importance of providing better opportunities to developing countries to secure a larger share in the world trade in foodstuffs, e.g. through the utilization of a growing proportion of cash resources available for multilateral or bilateral food aid for purchases in developing countries;

(iv) Stress the need for easier conditions for compensatory assistance by IMF and other agencies in case of balance of payments difficulties arising from fluctuations in external receipts and payments or for the establishment and operation of commodity buffer stocks, support initiatives designed to provide longer-term financial assistance to developing countries, particularly with respect to balance of payments difficulties resulting from export losses as well as excessive import costs, etc.

Chapter 19

International Agricultural Adjustment

637. That the world food economy will be required to make great changes is apparent from the simple arithmetic and geographic location of population increases and demand growth. The prevailing trends and patterns of food production and trade must be adjusted in various ways to meet the challenges which will arise in the future. If most of the suggestions so far made in this document are acceptable and the political will and administrative capacity are there to carry them through over the long haul, the world food situation can certainly be improved.

638. But adjustments to world agriculture cannot be made by national efforts alone. Investments will not be made, or will be inadequate or misdirected, if major sectors of the food economy continue to be subjected to upheavals such as have occurred in recent years. If there is no better assurance of the availability of supplies on markets in the face of short-term production fluctuations, there will be irresistible pressure on deficit countries to strive for near complete self-sufficiency in basic foods, even if their resources could be more productively employed in other lines. Continued and violent market instability and lack of assurance as to supply availabilities could thus hinder or, more likely, jeopardize seriously the success of the action proposals given in this report for the acceleration of food production, and gravely limit the potential contribution which international trade can make to food supplies.

639. For these reasons the report has stressed earlier the importance of stabilization and food security as a major prerequisite to improving the world food situation, and possible mechanisms have been suggested. In turn, however, these or any other stabilization and security mechanisms will work satisfactorily only if necessary adjustments are made in production and trade so as to keep the underlying trends of supply and demand reasonably in balance, and if the trade and market performance is in keeping with broader goals accepted by governments.

640. Cereals give an instance of the need and scope for adjustment. Earlier parts of the report have suggested how some developing countries could make increasing quantities of cereals available for export, and that the gross import requirements of developing countries may become stabilized at a relatively high level. Projection studies indicate that the potential capacity of the developed world to produce cereals is such that no more than a continuation of their linear trend of output (i.e. a constantly diminishing rate of growth) would generate surpluses considerably in excess of the total of their own requirements for feed and food plus the net import requirements of the developing world. The reconciliation of these potential trends could be brought about in various ways, some of which would intensify and others which would lessen the difficulties of the countries concerned,

especially the economically weaker developing countries. How the adjustment actually takes place will depend largely on policy decisions. For instance, as part of the process of adjustment, some future exports to developing countries, which would otherwise come from developed countries on concessional terms, could take the form of increased trade amongst developing countries if the importers could be assisted in financing the purchases. The way the adjustments are made also affect employment and hence the ability to buy food. Studies by the ILO indicate that direct employment creation by a trade-based shift of some of the future cereals production from developed to developing countries would vastly outweigh employment displacement in the former. For instance, for each person displaced from rice production in the developed world as a result of developing countries taking over some exports previously made by developed countries, 10-20 persons would gain employment in developing countries. This is the estimate for rice-producing countries with per caput GDP of around U.S.$ 300 (1963 prices). At lower levels of GDP, the employment-creating effects would be markedly greater. To conclude, while there are elements of serious potential maladjustment in the world cereals trade, there are equally opportunities for an orderly adjustment which could particularly help developing countries. In such a situation, a consensus as to what long-term changes should be sought and the means by which national actions could be made sufficiently consistent one with the other in an acceptable framework of world agricultural development, is an essential complement to stabilization and other current measures.

641. This is no more than one example, although a very important one, of the need for effective cooperation and coordination amongst countries as regards the nature and means of future adjustments of food production. As yet, however, there is really no system or arrangement for dealing on a continuing basis with the big adjustment issues of the food sector and for reaching a common view of the broad nature of desirable changes. In food, as in other fields such as the monetary system or the preservation of the natural environment, or the exploitation of the resources of the sea, the "one-world" stage has now arrived with its imperative need for shared basic objectives as to future adjustments, for a framework for continuing consultations and negotiations, and for mechanisms which can translate the policy objectives into practice without impairing incentives. The necessary long-term strategy - or alternative strategies - for the major sectors of world food and agriculture needs to be spelled out.

642. The only strategy of this nature which exists is that of the Second UN Development Decade which, however, provides only a very broad frame rather than one which is operationally directed to a single sector. The 1973 session of the biennial FAO Conference, at which international agricultural adjustment was a major theme, considered that the serious imbalances and fluctuations in the world food and agricultural economy in 1972 and 1973, from which both developed and developing countries had suffered, dramatically illustrated the need for new international approaches. The Conference also affirmed that in view of the increasing interdependence

of the economies of individual countries a global concept of agricultural adjustment - by which it understood the bringing and keeping of supply and demand into a more satisfactory balance nationally and internationally while taking account of broader economic and social goals - was essential. The Conference decided that FAO should evolve a proposed strategy of international agricultural adjustment to facilitate, inter alia, a faster and more stable growth in output, especially in developing countries, which would take advantage of varying resource endowments of countries and which would facilitate an orderly acceleration of trade in agricultural products with a rising share for developing countries.

643. This decision by the member countries of FAO marks an important step in the evolution of an international framework to assist policy formulation. The Director-General is to present the first draft of such a proposed strategy early in 1975 and the final version will be discussed at the FAO biennial Conference in November 1975. The documentation prepared for the World Food Conference and the conclusions which will emerge from it will provide major elements of the strategy. Particular attention will thus be given to policy implications and requirements at both national and international levels arising from the international adjustment objectives laid down by the FAO Conference and from the recommendations of the World Food Conference. The timing of this first statement of a continuing framework for a world food and agricultural strategy is such that it will represent an early follow-up to the Food Conference.

644. It bears repeating that an attempt to formulate a strategy of international agricultural adjustment comes from the acceptance of food availability together with adequate supplies and remunerative prices of agricultural raw materials as a responsibility of the international community as a whole. In formulating and adapting their policies in keeping with this responsibility, countries need the help of a global framework which includes broad objectives regarding desirable developments in the world food and agricultural situation, which translates these objectives into concrete action proposals and policies, evolves arrangements for policy consultations and negotiations bearing on adjustments in agriculture and, finally, provides for periodic monitoring of actual developments against agreed benchmarks. Such a policy framework is certainly an ideal which will never be completely attained, but equally, the world can no longer afford the consequences of its complete absence.

645. The international community has attempted from time to time to come to grips with fundamental issues of food availability and distribution but usually only when an emergency existed, such as immediately after the Second World War or now when a combination of unforeseen events concerning food have resulted in grave difficulties for both developed and developing countries. The formal or informal arrangements which are made at such times and the attempts then launched at greater coordination among countries usually lapse once the emergency is over. What is proposed now is that the world food situation, prospects and adjustment requirements in the long as well as the short run should be put under permanent and systematic

surveillance, with arrangements for facilitating the greatest possible degree of consensus as to what changes to make and how to make them. The World Food Conference is therefore invited to:

(i) Re-affirm the importance given by the member countries of the FAO to international agricultural adjustment and the need for governments to work together toward greater consistency in their national and regional policies bearing on future changes in food and agriculture;

(ii) Request the Director-General of the FAO to take full account of the discussions and recommendations of the World Food Conference when drafting his proposed strategy of international agricultural adjustment so that this can be the major and continuing framework for the follow-up of the recommendations of the World Food Conference.

Section V

ARRANGEMENTS FOR FOLLOW-UP ACTION

Chapter 20 : The Need for a World Food Authority

Chapter 20

The Need for a World Food Authority

646. The proposals presented in the preceding four sections are not entirely new or original. Many of them have been presented and discussed in one form or another in many different forms in the past three decades.

647. Soon after the creation of the Food and Agriculture Organization, proposals for setting up a World Food Board were put forward to the Second Session of the FAO Conference in 1946 "to ensure that sufficient food is produced and distributed to bring the consumption of all peoples up to a health standard". In December 1954, the United Nations General Assembly passed resolution No. 827(IX) on the establishment of a World Food Reserve for "raising low levels of food production and standards of consumption of food in many areas of the world, where famine or chronic malnutrition is a major problem, counteracting excessive fluctuations in the prices of agricultural products and promoting the rational disposal of intermittent agricultural surpluses". In 1955, the U.S. Senate in its Resolution No. 85 proposed that "the President of the United States should negotiate, through the framework of the United Nations and other international channels, an agreement for the creation of a World Food Bank from which member nations could borrow foods or fibres or both and repay such loans when able in kind or in cash, to help provide for the basic needs of millions of chronically undernourished and ill-fed people, to help meet the problems of famine and hunger, tend to bring in balance world production and consumption of agricultural products and wipe out surplus stocks which are costly to maintain".

648. The two World Food Congresses, the first held in Washington in 1963 and the second at The Hague in 1970, also presented an impressive list of recommendations and proposals to tackle the world food problem. The first Congress called for "the formulation of a world plan in quantitative terms which would be based on nutritional and economic development needs, and would indicate the type and magnitude of external assistance needed, with a balance sheet of the needs and the resources available for the war on hunger". (These recommendations led to the submission, in 1969, of FAO's Indicative World Plan for Agricultural Development). The main focus of the Second Food Congress was "to launch an all-out attack against the scourge of poverty and hunger ... and to see how resources which technology and science had made available might be utilized in such a way as to bring a better life to mankind".

649. Some of these proposals did lead to action; the World Food Programme was created in 1963, and international financing and other agencies have already stepped up their programmes in support of

agriculture. Yet, in 1972, when a food crisis of major proportions gradually mushroomed, the world found itself unprepared to meet the situation effectively. At certain points of time, prospects of mass starvation looked very real indeed, but have been narrowly avoided, at least for the time being, because of good crops in 1973, and hopefully in 1974. The presentation of another set of proposals, as in this document,will not by itself provide or enhance food security. The real task will be effective implementation and follow-up action.

650. A careful analysis of various proposals presented and discussed in the international fora in the past three decades and of the reasons for the lack of adequate support for their acceptance or implementation will show that many of them were either over-ambitious or premature. Even those that were appropriate and timely have not been implemented adequately for a want of financial or policy support, with a few notable exceptions. The widespread recognition of the seriousness of the world food problem, reflected in the very decision to convene a World Food Conference, lends strength to the expectation that the international community is ready for considering and implementing more effective solutions to the problem. At the same time there is enough evidence to show that the problem, in the absence of adequate national and international action, could become even worse and perhaps unbearably serious in the future. The perils of inaction are much greater than the costs or risks involved in the proposed action programme.

651. In the preceding chapters, a number of proposals have been made which are designed to increase food production, improve nutrition, strengthen world food security and stabilize prices and expand export markets. These proposals are for consideration by governments and their final shape as well as the required follow-up arrangements, including the establishment of a World Food Authority suggested in the preceding chapter, will clearly depend on the consensus reached at the World Food Conference. One thing, however, is certain : the practical value and the impact of the action proposals approved by the Conference will hinge on the appropriate arrangements for the effective implementation of these proposals.

652. Many governments have already submitted various proposals at the second meeting of the Preparatory Committee of the World Food Conference, to accelerate or facilitate the implementation of recommendations of the Conference. These include: (i) the proposal to set up a World Fertilizer Fund, put forward by Sri Lanka and by the Secretariat of the Economic Commission of Asia and the Far East, following a resolution of the Commission; (ii) proposal by Mexico for a World Bank of Food, Agricultural Inputs Supply and Research; (iii) proposal by Sierra Leone on behalf of the African Group for an Agricultural Development Fund; (iv) proposals by Bangladesh for a World Food Security Council, world food bank and international agricultural development bank.

653. The main focus of these proposals, which are complementary in their scope and objectives, is on three main aspects of the food problem: (i) to increase the flow of resources for agricultural and food production, and in particular for fertilizers, other inputs and research; (ii) to channel larger quantities of food aid to developing countries; (iii) to find an improved mechanism to coordinate international policies on food security and other related questions.

654. The Preparatory Committee has invited a special meeting of interested delegations from 16 September 1974, to discuss these and other related proposals and has emphasized the need for an integrated approach in consideration of these proposals. At the same time it would be unrealistic to suggest the creation of a "supranational" body or organization which will oversee everything and monitor national policy or actions in all the fields. What is essentially needed is a mechanism that will provide sustained and effective support to national action necessary to achieve the desired objectives and at the same time facilitate coordination of international actions and policies in all the related and complementary areas.

A World Food Authority

655. As already mentioned all the proposals and recommendations presented in this document are aimed at two principal objectives: a) a strategy for increasing food production and consumption, and b) evolving and implementing a world food security policy. The targets and goals suggested in relation to (a) cannot be achieved unless steps are taken to increase the flow of resources for agricultural development and food production, and in particular to support programmes for the development of land and water resources, the assured supply of essential inputs like fertilizer, improved access to better technology and appropriate changes in rural structures and services. The objectives of strengthening world food security similarly require interrelated actions on (i) an improved food information and early-warning system, (ii) coordinated stock policies to provide collective insurance against food shortages and against instability in food supplies and prices, (iii) improved arrangements for meeting emergency food requirements, (iv) a longer-term and more stable policy for food aid.

656. Many of the actions recommended fall partially or fully under various existing agencies or lending institutions, but for some the implementation mechanism is non-existent or unclear. And more important, there is no direct interrelationship between several of the bodies which are responsible for providing financial and technical assistance to developing countries and those agencies which can or might coordinate national and international policies on food aid and food

security. The Secretary General of the World Food Conference would therefore propose that the World Food Conference recommend the creation of a new body, perhaps to be called a "World Food Authority", to implement or coordinate the implementation of appropriate recommendations and decisions of the Conference. Such an authority could have essentially three functions:

(a) to mobilize international financial assistance for agricultural development in developing countries in the form of grants, concessional loans, and commercial loans including assistance from new sources which may not be equipped to channel such funds individually: using existing channels of disbursement and technical support where feasible;

(b) to provide support to a wider system of world food information and food security and to facilitate the observance of the International Undertaking on World Food Security;

(c) to facilitate the implementation of the longer-term food aid policy proposed for adoption by the Conference.

657. The precise structure and organization of the proposed Authority would require a great deal of further discussion among the governments concerned, but it could conceivably consist of:

(i) A permanent intergovernmental Council, with half its members elected by the United Nations General Assembly and the other half by the FAO Conference on the pattern followed for the Intergovernmental Committee of the UN/FAO World Food Programme.

(ii) An Agricultural Development Fund, to provide grants, soft loans and commercial loans for increasing food production in developing countries, mainly through existing institutions, but with its own Board of Directors responsible to the Permanent Council, with weighted voting rights in proportion to contributions and special representation from recipient countries.

(iii) A Committee on Food Security to facilitate the observance of an International Undertaking on Food Security.

(iv) A Committee on Food Aid to facilitate the implementation of the long-term food aid policy being recommended to the Conference.

658. A possible organization structure for such an Authority is illustrated in Annex B to this chapter.

659. The proposed structure and functions of the Authority are to provide for a mixture of various kinds of functions that are

necessary - i.e. an agricultural development fund which, while using the existing financing and development agencies to the maximum to channel development assistance, will provide for a mechanism to determine policies and priorities for such assistance; with two associated Committees of a consultative nature which would enable development financing activities to be related to the evolution of international policies and actions on food security and food aid. The FAO Council is in fact already considering the creation of a special body to deal with questions of food security. The proposed Authority would not therefore become another operational agency of the United Nations nor would it take over the functions of the existing agencies like UNDP, FAO, WFP or IBRD. In fact the main aim of the Authority would be to strengthen action by existing agencies in support of agricultural development and to provide for a mechanism whereby governments can better coordinate international action and policies in the three interrelated fields of food production, food security and food aid.

660. The proposed Authority, if created, should be able to meet and pursue the essential objectives of specific proposals referred to earlier and summarized in Annex A to this chapter.

Agricultural Development Fund

661. The most important component of the proposed Authority is the creation of an Agricultural Development Fund. As already mentioned in Section I, the present flow of financial resources for agricultural development in developing countries is grossly inadequate. It has been recommended that the World Food Conference endorse an annual target of U.S.$ 5 000 million for external assistance for agriculture in developing countries. Part of these resources can be secured from existing national and international sources but some portion is expected from potential new sources, particularly the oil-producing countries which have shown considerable interest in assisting developing countries in their economic and social development. Many oil-producing countries have already taken commendable initiatives in setting up or contributing to various national or regional bodies or funds set up to assist developing countries. Some have also indicated their willingness to make contributions to existing international financing institutions for this purpose. However, any expectations of major participation by the oil-producing countries in future international efforts to solve the food problem must be followed by efforts to devise special arrangements that will promote and encourage such participation.

662. The proposal for an Agricultural Development Fund, apart from providing a coordinated institutional framework for sustained support to actions and programmes in several interrelated sub-sectors is intended to provide for such cooperative arrangements. The proposed Fund, while under the political umbrella of the Permanent Council of the World Food Authority, will have its own Board of Executive Directors

with weighted voting rights (on the pattern of the World Bank). The recipient countries could also have special representation on the Board of Directors. The fund will utilize existing agencies like IBRD, Regional Banks, UNDP, FAO and other appropriate agencies for channelling assistance to developing countries or for achieving its other objectives. Only in those few cases where no existing international organizations can undertake the required activities, the need for new institutional arrangements may arise. For example, in cases of large river basin development or other projects involving several countries, the proposed Authority might appropriately assist the setting up of a multi-national organization, like a "Sahelian Development Agency" or a new intergovernmental body on the lines of the Mekong Committee.

663. The Conference will have to consider and recommend an acceptable formula on the basis of which participating countries can contribute to the Fund. The activities of the proposed Fund will essentially supplement existing bilateral and multilateral assistance programmes and are not intended to replace them.

664. The Conference may also wish to consider the overall order of priorities which could guide the operation of the proposed Fund. These might include assured supply of fertilizer at reasonable prices, extended support for national and international research and training programmes, high priority land and water development projects, special support for integrated rural development programmes, building up of adequate food stocks in developing countries, special nutritional programmes and many other specific projects recommended in the earlier parts of this document.

Committees on Food Security and Food Aid

665. The functions proposed for the Committee on Food Security and Committee on Food Aid under the World Food Authority fall largely within the present Charter of FAO. The association of these two Committees with the Agricultural Development Fund under a joint UN/FAO umbrella of a World Food Authority would elevate the political support available to the Committees, without minimizing the importance of FAO's professional and technical support, necessary for the efficient performance of these activities. At the same time the work of these two Committees could receive valuable financial support from the proposed Agricultural Development Fund.

666. Once the proposal to create a World Food Authority is accepted in principle, it should be possible to define more precisely its functions and organizational details. What is important is to accept the need for such a mechanism and allow its detailed operational and other arrangements to evolve gradually in the light of actual experience.

667. Considering the paramount importance of effective follow-up action and adequate implementation of its recommendations and decisions, the Conference may wish to:

(a) Recommend, in principle, the creation of a new intergovernmental body called the World Food Authority to implement or coordinate the implementation of appropriate recommendations and decisions of the Conference, through (i) a Permanent Council, (ii) an Agricultural Development Fund, (iii) a Committee on Food Security, (iv) a Committee on Food Aid, on the lines illustrated in Annex B to this chapter.

(b) Appoint a working party of interested governments to work out the precise functions, organizational and procedural details and legal instruments for setting up the proposed Authority.

Annex A to Chapter 20

Summary of the specific proposals presented at the Second Session of the Preparatory Committee of the World Food Conference, (Geneva, 4-8 June 1974)

A. The World Fertilizer Fund - Proposal by Sri Lanka

668. The proposal for the World Fertilizer Fund was first put forward by the Prime Minister of Sri Lanka during the inaugural address to the Thirteenth Session of the Economic Commission for Asia and the Far East (ECAFE) held at Colombo, Sri Lanka in March/April 1974. The ECAFE, in response to this proposal, adopted a resolution 142(XXX) on the "Establishment of a World Fertilizer Fund", calling upon the Executive Secretary of the Commission to formulate for consideration by the World Food Conference in 1974 concrete proposals for establishing a World Fertilizer Fund to assist developing countries in procuring supplies at reasonable prices and to expand fertilizer production. Subsequently, in April 1974, the Sixth Special Session of the United Nations General Assembly on Raw Materials and Development transmitted a resolution put forward by New Zealand and Sri Lanka to the Economic and Social Council, which subsequently adopted Resolution No.E/RES/1836(LVI) on emergency measures in regard to supply of fertilizers and pesticides.

669. At the Second Session of the Preparatory Committee of the World Food Conference in June 1974, Sri Lanka put forward a proposal on the establishment of a World Food Fertilizer Fund, to be set up under the auspices of the United Nations, with the following objectives:

(i) To organize the availability of short- and medium-term credits for imports of manufactured fertilizer and of raw materials, including petroleum, used in the production of manufactured fertilizer;

(ii) To organize the channelling of funds from governments, international financing agencies, private investors, etc., for the expansion of the fertilizer industry, particularly in the developing countries;

(iii) To organize the availability of fertilizers to developing countries in adequate quantities and make arrangements if necessary for bulk purchases, forward contracts and long-term supplies based on export and import quotas on the lines of other international commodity agreements; for this purpose, the Fund may prepare a 10 to 15-year International Fertilizer Plan, supported by an International Agreement among governments to buy and sell specific quotas at agreed prices;

(iv) To organize the availability of fertilizer plant manufacturing capacity, geared to handle the expansion of the fertilizer industry, both in the developed and developing countries;

(v) To organize the availability of long-term investment capital to new plants in developing countries, and countries with comparative advantage, particularly those having access to raw materials; for this purpose, the Fund may evolve a possible Investment Guarantee Agreement for the Fertilizer Industry to provide security for foreign investments;

(vi) To organize research on a global basis into all aspects of production and consumption of fertilizers.

670. On the basis of certain broad guidelines, it was considered appropriate to set up a one billion dollar World Fertilizer Fund. This would be an annual recurrent expenditure, and will have to be provided for by pledges to be called for and given at the forthcoming World Food Conference.

671. In pursuance of Resolution 142(XXX) adopted by the Economic Commission for Asia and the Far East (ECAFE) at its Thirteenth Session (Colombo, March/April 1974), the Executive Secretary of ECAFE has formulated a proposal for the immediate establishment of a World Fertilizer Fund. Its main objectives are very similar to those envisaged under the Sri Lanka proposal. Under the ECAFE proposal, the Fund will provide short- and medium-term financing facilities to developing countries on concessional terms for imports of raw materials and other maintenance requirements for the manufacture of fertilizers. It would also provide an arrangement for long-term credits on concessional terms for increasing fertilizer production capacity and also promote research and development on all aspects of fertilizers. The criteria for priority in the utilization of these facilities would have to be established taking into account the diversity of the economies of various developing countries.

B. Establishment of a World Bank of Food, Agricultural Inputs Supply and Research - Proposal by Mexico

672. In order to prevent the world food crisis from continuing and even worsening over the next few years, Mexico has proposed to establish a World Bank of Food, Scarce Inputs Supply and Research with the objective of supplying scarce inputs to the developing countries. The functions of this Bank would be to build up a substantial reserve of cereals and agricultural inputs and to impart a progressively internationalized structure to agriculture, to the production and supply of agricultural inputs, to research and to its ultimate aims of social and economic transformation of vast traditional societies. Mexico has announced its intention to submit a detailed operational proposal on this subject at the Third Session of the Preparatory Committee of the World Food Conference.

C. An Agricultural Development Fund - Proposal by Sierra Leone on Behalf of the African Group

673. The delegate of Sierra Leone, in his statement at the Second Session of the Preparatory Committee, made a proposal on behalf of the African Group for the establishment of an Agricultural Development Fund along the following lines:

- The present flow of investments for agricultural development are grossly inadequate. Some new method of increasing the availability of such funds on a sustained basis must be found, in order to increase the rate of agricultural development to meet the demand for food, which is increasing at rapid rates.

- It is hoped that such funds can be obtained through contributions from all countries and in particular through contributions made by developed countries (OECD and Socialist countries) and other potential donors (oil producing countries), on some agreed-upon basis.

- Such additional financial resources should focus on programmes and investments which will have both short and longer-term contributions toward increasing agricultural production in the developing countries.

- The main functions of the Agricultural Development Fund can be outlined as follows:

  (a) To finance measures to increase agricultural production and in particular the special projects which are international in scope or concern such as the rehabilitation of the Sahelian Zone, or the development of land and water use, the improvement of availability and delivery system for productive inputs and additional credit to finance the use of such inputs by small farmers.

  (b) To finance the accumulation and storage of reserve food stocks.

  (c) To finance increased production capability of developing countries through training, extension programmes, feasibility studies and research.

  (d) To finance the purchase of agricultural inputs to meet the short-run needs of developing countries, the development of greater fertilizer production capacity in developing countries and in particular, the oil-producing countries.

674. Obviously this fund would consist of a grant portion, a concessionary loan portion and a commercial bank portion with individual functions to be financed from one or all of such available funds, depending upon the circumstances of the recipient country and the nature of the project involved.

D. World Food Security Council, World Food Bank and International Agricultural Development Bank - Proposals by Bangladesh

675. The delegate of Bangladesh, in his statement at the Second Session of the Preparatory Committee, proposed the establishment of a World Food Security Council, World Food Bank and International Agricultural Development Bank along the following lines:

676. A World Food Security Council should be set up with powers to intervene in emergencies concerning the world food situation and take prompt, effective and timely corrective measures. This Council, which will be subordinate to and in close liaison with the UN General Assembly, will have adequate support and assistance from other UN agencies to carry out its functions which will include the following:

(i) To monitor world food situation, including shortages, price abnormalities and food trade imbalances;

(ii) To receive regular periodic reports from governments and international organizations on world food and agriculture;

(iii) To devise an early warning system against impending crises;

(iv) To intervene in emergencies for prompt redress of suffering.

677. The proposed World Food Bank will maintain reserves of food and essential agricultural inputs at strategic regional points. Its functions will include:

(i) Emergency relief in disaster-stricken areas;

(ii) Food aid to meet shortages;

(iii) Food aid for development;

(iv) Assistance to national food reserves; and

(v) Maintenance of international food reserves.

678. The proposed International Agricultural Development Bank will define specific areas of priority assistance and investment, particularly in the developing countries. Its funds would come from existing international financing agencies, OPEC and developed countries. Among other things, this Bank would also identify, for intensive agricultural investment, the least developed and most depressed areas in the world that enjoy the potential for development.

Annex B to Chapter 20