



REPORT  
ON THE PILOT PROJECT  
ON AGRICULTURAL DEVELOPMENT  
THROUGH MULTINATIONAL CO-OPERATION  
AND TRADE EXPANSION

(Dahomey, Niger and Nigeria)

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TRADE EXPANSION

P R E F A C E

This joint ECA/FAO study was undertaken by the ECA/FAO Joint Agriculture Division with the regular programme resources of FAO and ECA and with assistance from the United States Agency for International Development (USAID).

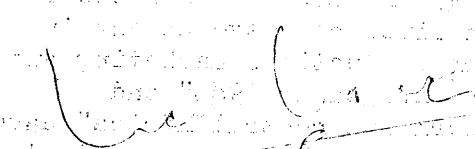
The objective of this pilot project is to study and propose the approach to be adopted for the promotion of economic co-operation for agricultural development in African countries and for the expansion of intra-African trade in agricultural products. Thus, while the study covered three countries, namely, Dahomey, Niger and Nigeria, it is meant for general application after the necessary adaptation to particular situations and circumstances. Consequently, no attempt has been made to propose institutional arrangements for fostering co-operation among the three countries. The countries have only provided the framework for analysing how, in co-operation proposals, the interests of richly endowed countries and poor countries and of coastal and land-locked countries could be reconciled.

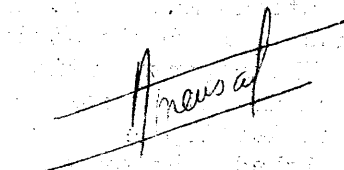
The study is part of Phase II of the project on intra-regional co-operation and trade in the field of agriculture (the original title of the project) which the ECA/FAO Joint Agriculture Division has been executing. This project was recommended by the FAO Regional Conference for Africa in 1968 and endorsed at the ninth session of the United Nations Economic Commission for Africa in 1969. The Phase I studies, which were undertaken on subregional basis, were completed in 1971, but they were only preliminary macro-desk studies and the recommendations made were largely indicative. Following the Phase I studies, two Phase II in-depth studies were made on livestock development in eastern Africa. The reports entitled "Prospects for production, marketing and trade in livestock and livestock products in eastern Africa to 1985" and "African livestock development study, Part I: southern and central Africa" have already been published. However, from the discussions that have been held at Conferences and intergovernmental meetings and at the national level since the completion of the Phase I studies, it has become evident that, for the general in-depth study to be useful, a completely fresh look needs to be taken at the methods and approaches for promoting co-operation for agricultural development and expansion of intra-African trade in agricultural products with a view to proposing how the various problems that plague economic co-operation in Africa could be surmounted. The pilot project was therefore planned for this purpose.

The report of the project discusses the objectives and problems of economic co-operation for agricultural development and examines the strategies for agricultural and agro-industrial development. It contains two basic recommendations. The first is that a change in agricultural development policy towards a more dynamic and more balanced policy is necessary for reaping fully the benefits of co-operation through specialization according to resource endowment. The change in policy is also necessary for promoting effective economic co-operation by ensuring a steady supply of commodities to the markets of the grouping and, at the same time, avoiding the disruptive effects which the levelling of prices that results from liberalization of trade among the co-operating countries could have on farmers' incomes and on consumer prices. The second basic recommendation is that co-operation measures should be concerned with the establishment of an economic and institutional framework such as would promote self-reliance and provide equal opportunities for the co-operating countries to expand production and to promote industrialization. Within this framework, the countries will be free to pursue their agricultural and agro-industrial development policies and share freely in the markets of the grouping. It is intended that these recommendations will guide future studies on this subject.

The findings and the recommendations of the project are commended to the attention of all the African Governments and all the economic groupings in Africa. It is hoped that they will find the report useful in the formulation and implementation of their co-operation agreements on agricultural development, including the implementation of the ACP - EEC Lomé Convention. Comments on the study will be appreciated and taken into consideration in the final version of this report and in planning future studies in this field so as to ensure that they are really relevant to actual situations.

Appreciation must be expressed to the Governments of the three countries covered by this study, to their technical experts who have contributed to the study and to the United States Agency for International Development and the experts it has supplied who assisted in the study.

  
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## SUMMARY AND CONCLUSIONS

1. The project on intra-regional co-operation and trade in the field of agriculture was approved in 1968/69 by the fifth FAO Regional Conference for Africa and the ninth session of the United Nations Economic Commission for Africa (ECA), 1969. It was thus a joint ECA/FAO project, the execution of which was entrusted to the Joint ECA/FAO Agriculture Division. By 1971, the Phase I study, which was largely a macro-study undertaken on a subregional basis, was completed and published. Detailed consideration was then given to the methodology and coverage of a follow-up Phase II study which was intended to be an in-depth study of the agricultural sector geared to the promotion of co-operation for agricultural development and expansion of inter-country trade. In view of the difficulties being experienced in promoting co-operation among African countries, it was decided to first undertake a pilot project covering Dahomey, Niger and Nigeria which would explore the methodology for undertaking a comprehensive Phase II study in a way which would readily achieve the objectives of the project. The title of the project was changed to "Agricultural development through multinational co-operation and trade expansion" in order to reflect the basic objective of the project.
2. The choice of the three countries for the pilot project was made with a view to providing a framework for ascertaining the co-operation arrangement that should exist between a bigger and more richly endowed country (Nigeria) and much smaller and less richly endowed countries (Dahomey and Niger) as well as between coastal countries (Dahomey and Nigeria) and a land-locked country (Niger), in addition to ascertaining the complementarity that exists between the countries of the tropical forest zone and of the Sudano-Sahelian zone. The study included agro-industrial products in view of the important role which the agricultural processing industry plays in the promotion of agricultural development. The pilot project was designed to explore the ways of surmounting the problems of economic co-operation and, at the same time, providing a framework for fully exploiting the benefits of co-operation for the development of the agricultural sector.

### Objectives of co-operation for agricultural development

3. The basic objectives of promoting co-operation for agricultural development are:
  - (a) to promote specialization and thereby reap the gains from the greater efficiency that results from specialization. While there are technical problems in promoting specialization on a comparative cost-advantage principle, the co-operation arrangement should be such as to surmount these technical problems and facilitate improvements in production techniques and the full exploitation of agricultural resources while, at the same time, allowing the co-operating countries to specialize according to their agricultural resource endowment;

- (b) to exploit the complementarities that exist among the co-operating countries, especially as a result of differences in climatic conditions and differences in soil characteristics and in altitude;
- (c) to promote intercountry trade in order to provide additional incentives for increasing production, promote the substitution of food imports and provide an outlet for the surpluses that inevitably result from the expansion of agricultural production as well as for the products that are produced at costs higher than international market prices but lower than import parity prices in the other co-operating countries; in this respect, with the unemployment and underemployment that exist in African countries, trade diversion is beneficial to the economies of the co-operating countries so long as the unit value of the local component of domestic production is higher than the unit value of low-cost (low-price) imports.
- (d) to pool production resources and thereby facilitate their full and efficient utilization.

#### Problems of economic co-operation

4. The main economic problems of co-operation include economic relations with developed countries, the reluctance to depend on other countries for the supply of vital products and services resulting in the pursuit of self-sufficiency in food production, the fear that the bigger or more richly endowed countries will dominate the other members of an economic grouping and economic nationalism. Co-operation measures, to be effective, should be capable of surmounting these problems. The infrastructural problems of payments arrangements and transportation facilities are widely recognized, while the largely financial problem of the sharing of benefits that accrue from co-operation can better be solved if considered along with the not easily quantifiable benefit of equal opportunity with the other members of the grouping to expand production and to receive special treatment from and share freely in the markets of the grouping. Underlying all these is the problem relating to the political will to adopt the policies and programmes that facilitate economic co-operation and promote rapid economic development.

#### Methodology for the study and strategies for agricultural and agro-industrial development

5. An easy approach to proposing measures for economic co-operation for agricultural development is to identify the crops that feature strongly in intercountry trade and assess the production possibilities for these crops with a view to indicating potential surplus and deficit countries on the basis of which production policies would be harmonized and intercountry trade promoted. This approach has not been adopted for the pilot project for the following reasons:

- (a) experience has shown that it is not easy for countries to reach agreement and promote trade simply on the basis of surplus and deficit supplies of commodities, and little has resulted from the Phase I study in which surpluses and deficits were identified and trade matrices prepared;
- (b) most of the field crops are produced in mixtures and in rotation by small farmers and it is therefore difficult to determine sufficiently precisely how much of each of the selected crops will be produced by each of the co-operating countries and to ensure that there is a steady supply;
- (c) concentrating on a few crops does not ensure the best utilization of production resources since it tends to divert resources from the production of other crops even where the selected crops are only marginal;
- (d) considering that there is limited information on ecological characteristics and on agricultural potentials in general, selecting a few crops may have a limitative effect on agricultural development since it will not make sufficient allowance for changes in technology and in farming patterns as information on agricultural potentials improve;
- (e) concentrating on a few crops does not provide a sufficient basis for the development of the farm and improvement in the capacity of the small farmers to increase their output and income as well as for exploiting the advantages of crop mixtures and crop rotations, especially with regard to soil conservation, control of insect pests and diseases and insurance against bad weather.

6. In view of these, a broad-based approach has been adopted and emphasis has been given to the strategies and policies for increasing agricultural and agro-industrial production. To this end, the following special studies were undertaken:-

- (i) A comparison was made of the profitability of producing food crops, on the one hand, and traditional export crops, on the other hand. The net returns per acre from the data on traditional farm practices collected in Nigeria for 1966/67 indicated that, on the basis of the prices ruling in the nearby markets or buying points, the farmers in northern Nigeria gained more from producing food crops than from producing export crops whereas, on the basis of international market prices (export parity prices for the export crops and import parity prices for food crops), the gains to the economy were similar for the two groups of crops. A similar analysis made for 1972/73 under improved farm practices showed that the net returns at local prices were considerably higher for food crops than for export crops whereas, on the basis of export-import parity prices, the net returns were similar. Similar results were obtained from data collected in an agricultural region in Dahomey. The data

taken from a farm income and resource management study in the Western State of Nigeria for both existing and improved farm practices showed similar results. These analyses indicate that the agricultural development policy in Africa, which hitherto has given priority to the production of the traditional export crops, has not been a balanced policy. The neglect of food crops has resulted in high import bills for food products. Foreign exchange could have been saved, and also earned, by expanding food crop production and national income could have increased faster if the production of food crops had been intensified along with the production of export crops.

- (ii) The profitability of family farm agriculture has also been compared with that of large-scale agriculture. Government operated large-scale agricultural production has generally not been profitable in Africa. The data taken from a farm income and resource management study in the Western State of Nigeria show that small farms have higher gross receipts and higher net receipts than medium-size farms, indicating greater efficiency for small farms. Also on the basis of a feasibility study, allowing for similar super-structures and lower yields for small farms or family farm agriculture, the net social benefits from family farms are higher than those of large-scale agriculture. The benefit of lower unit costs under large-scale production is lost through the export of part of the revenue in payment for imported machines and equipment necessarily used in production. The national product as well as the personal income of the producers is, therefore, increased more through family farm agriculture than through large-scale production. There are also other problems of large-scale production including the problem of employing and supervising labour and the problem of unemployment resulting from the replacement of labour with machines.
- (iii) The third special study is the comparison of the benefits from labour-intensive and capital-intensive agro-industrial production. The results are similar to those of family farm and large-scale agriculture. The small-scale labour-intensive agro-industrial production also has other advantages over large-scale capital-intensive production which include the provision of an outlet for the products of small farms, greater efficiency considering that large-scale enterprises often operate below capacity and require high-level management, greater employment, and low-cost of collection of raw material inputs and distribution of final products. Since the economy gains more from small-scale labour-intensive production, a co-operation arrangement based on the promotion of this type of production enables the smaller countries in an economic grouping to industrialize side by side with the bigger countries.
- (iv) A preliminary study was made on the question of the stratification of livestock production. Such a programme is possible among the transhumant pastoralists and the sedentary Sudanian stock-owners. However, a detailed study is necessary in order to ascertain the availability of pastures and feed, the effects of livestock disease in the Sudanian zone and how marketing should be improved. For the programme to be successful, it has to provide higher income to both the transhumant pastoralists and the Sudanian stock-owners.

### Economic and trade links among countries

7. The report includes a short description of the agricultural situation and organization in the countries covered by the pilot project. The description indicates the existing state of agricultural production, existing agricultural potential and possibilities for future expansion of agricultural production. There are already some cooperation arrangements in which the three countries are participating and Niger and Nigeria have already established a Commission to undertake studies for the promotion of cooperation between them.

8. Considerable trade exists between Nigeria and Niger and between Nigeria and Dahomey. Much of this trade is unrecorded. Niger exports livestock and meat as well as cereals (sorghum) to Nigeria and imports manufactured products in return. Dahomey exports maize and yams to Nigeria and imports manufactured products. There is also considerable transit trade in manufactured products and drinks and Niger exports groundnuts and groundnut oil and cake through both Nigeria and Dahomey. The road links between Niger and Nigeria and between Nigeria and Dahomey are very good and transportation costs are sufficiently low. There is only one road link between Dahomey and Niger and the trade on this route is less than that across either of the other two borders.

### Proposed schemes for economic co-operation

9. The problems of economic co-operation will be better surmounted and the benefits of co-operation better realised if the following measures are adopted:

- (a) Removal of trade barriers and improvement of payments arrangements. The prices of food products in Dahomey are much lower than those in Nigeria and Niger, and Niger has surplus meat to export to Nigeria. There will, therefore, be mutual gains if trade restrictions are removed.
- (b) Mere removal of trade barriers may, however, disrupt the economies where price differences are great. It is, therefore, necessary to link it to dynamic policies for increasing production, especially with regard to the development of family farms. Co-operation could consist in implementing a common or co-ordinated minimum price policy for all the major crops combined with a price stabilization scheme by which the products can be purchased from the main producing areas and stored for distribution to the main consuming deficit areas. This should be closely linked to national programmes for increasing production. By organizing co-operation in this way, an opportunity will be provided for improvements in technology as well as for specialization and intensification of production according to agricultural potentials. Opportunity will also be provided for the exploitation of the complementarities that exist among the countries and for meeting the adverse effects of the vagaries of the weather. Since the market of the grouping will be left open to the products of the co-operating countries within the minimum price scheme and since stocks will be held in common, the fear of depending on other countries for food supply and the need for self-sufficiency in food production will be minimized. The scheme should also include a co-ordinated price and trade policy for export products.

- (c) In view of the difficulty in controlling inter-border livestock movements, the preference for warm meat and the low cost of transporting livestock on-the-hoof, it is preferable to establish abattoirs in both the livestock producing and consuming countries. However, with free movement of livestock, meat and other livestock products between the co-operating countries and a common export policy, it will be possible for the abattoirs in livestock producing countries to compete in the markets of consuming countries and, even more favourably, in external markets.
- (d) The co-operation arrangement for agro-industrial development should be based on the principles that every country in a grouping should have equal opportunity to industrialize and that agricultural raw materials should, as far as possible, be processed in the producing countries. Co-operation should consist in harmonizing agro-industrial development policies with a view to promoting small-scale and labour-intensive enterprises over large-scale capital-intensive enterprises. The demarcation line between the enterprises should be determined by the "social cost-benefit" ratio in which only the off-shore costs are regarded as costs and the rest of the value of production as benefits. There should also be a common export policy for the products of small-scale labour-intensive enterprises. Such a scheme will obviate the domination of the more industrially favoured countries over the rest while, at the same time, enabling such countries to develop their locally based industries. It also establishes a firm basis for industrialization, promotes self-reliance and ensures faster increase in the personal and national incomes in all the cooperating countries.
- (e) Within the framework of these schemes, smaller co-operation schemes, both on governmental and private bases, could be undertaken. Such schemes could include the establishment of joint plantations for the production and processing of such industrial crops as sugar-cane, the establishment of joint timber plantations for pulp and paper, disease-free zones, animal fattening centres and meat processing industries and the establishment of factories for refining sugar from small sugar plantations in neighbouring countries.
- (f) Co-operation arrangements should also extend to economic and agronomic research and training in order to promote exchange of information, economy in the use of trained research personnel and efficient utilization of research and training resources and facilities.

#### Present and future production and trade

10. In view of the unreliability of data, the diversity in end-uses for the food products and the fact that the crops are produced mainly by small farmers, orthodox methodologies have not been utilized to project supply and demand. Instead, the net increases in production over the increases that can be achieved under the existing policies have been estimated on the basis of the following equation:

$$P = \sum_{t=1}^n A Q_I \left[ a \log_e (bt) \right] - A t Q_P (1+r)^t,$$

where P = net increase in production,  
A = area covered annually by special programme,  
 $Q_I$  = possible yield from improved crop variety,  
 $Q_P$  = present (average) crop yield,  
r = annual rate of increase in yield under the present policies and programmes,  
t = time (in years),  
a & b being constants.

The net increase in demand has been determined by setting a target of 0.5 per cent per annum increase in per capita food consumption and subtracting the present rate of increase in food supply from the sum of the rate of population increase and the target rate of increase in per capita food consumption.

11. There are improved crop varieties that can yield 50 to 200 per cent higher than the present average yields. Such high increases in yield can be realised if effective programmes are adopted for assisting the farmers to adopt improved farm practices and if the necessary inputs are supplied. Such special programmes are already being tried in Dahomey and in one of the States in Nigeria. The programme in Dahomey, however, needs to be reoriented and based on the farm rather than on the crop. In view of the poor performance of the agricultural sector over the past years, such special programmes are a sine qua non to rapid increases in agricultural production in the countries studied.

12. Even when such policies are adopted, considering the limitation of resources, particularly trained manpower, the three countries will not be able to supply their combined food requirements in the years to come. Dahomey will be a surplus producer of most of the food crops, while Niger will be a surplus producer of beans. Nigeria will be a deficit producer of all crops except, perhaps, beans. Trade among the countries can thus expand with Dahomey being the main net exporter of food products and Nigeria the main net importer. On the other hand, Nigeria can export manufactured products based on rubber and timber as well as cotton fabrics, soap and margarine. Dahomey can also supply soap, margarine and cotton fabrics in addition to food products, while Niger can supply livestock and meat and dairy products as well as leather products and beans.



## I. INTRODUCTION

13. The project on agricultural development through multinational co-operation and trade expansion (formerly entitled "Intra-regional Co-operation and Trade in the Field of Agriculture") was recommended by the Fifth FAC Regional Conference for Africa in 1968 and supported by the ninth session of ECA in 1969. A Phase I study was undertaken and completed for each of the four African subregions in 1969-71. This Phase I study was largely a desk and macro-study which identified current commodity trade among African countries and made projections for 1975 and 1980 of total agricultural production and the production of the principal crops as well as the trade in the main products among African countries.<sup>1/</sup>

14. Considering that Phase I did not include field study of the measures for co-operation and the changes in agricultural production and trade policies that would be required effectively to promote co-operation for agricultural development and for the expansion of trade, the Seventh FAC Regional Conference for Africa held in September 1972 and the Second ECA Conference of Ministers held in February 1973 recommended that a Phase II in-depth study should be undertaken. By making this recommendation, the Seventh FAC Regional Conference endorsed the recommendations of a Seminar held in December, 1971, in the Gambia to consider the findings of the Phase I study for the West African subregion and the methodology for a follow-up in-depth study.

15. This Seminar recognized that the best utilization of the economic resources for the benefit of all the people of the subregion would require the harmonization of their development policies and programmes and recommended that the Phase II study should extend to measures for improving agricultural institutions and farm technology necessary for realising agriculture's dynamic contribution to economic development and for promoting intra-subregional co-operation and trade. The Seminar also recognized that the small-scale family farm would probably provide the most effective structure through which increased output and equitable income distribution could be realised and it recommended that emphasis should be placed on food crops.

16. In endorsing the recommendations of the Seminar, the Seventh FAC Regional Conference on its part recommended that the Phase II study should explore the ways of surmounting the problems of co-operation for agricultural development as well as the comparative contributions to the net national income of production for export to developed countries and production for intra-regional trade and the balance that should be maintained between the two. The primary emphasis has thus been placed on production.

17. In view of the slow progress so far made in promoting economic co-operation and in view also of the limitations of financial resources, it was considered advisable to start with a pilot project. Indeed, several studies have already been made by both the Economic Commission for Africa and by groups

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<sup>1/</sup> The studies were published as "Intra-Subregional Co-operation and Trade in Central Africa in the Field of Agriculture (Phase I)", Similar studies for East, North and West Africa.

of countries for the promotion of economic co-operation; also many meetings have been held to discuss the establishment of economic groupings, and several groupings have, in fact, been established; but there has been very limited success in achieving effective economic co-operation. There are great benefits to be derived from economic co-operation for agricultural development, but the problems are many. The pilot project was, therefore, designed to get to the roots of the problems and to explore the measures for promoting co-operation such as would surmount the problems and facilitate effective economic co-operation. The project was, therefore, to look into agricultural development strategies with a view to proposing modifications that would facilitate rapid increases in personal and national incomes through reaping the benefits of economic co-operation. It was also to indicate the interdependencies through trade that could exist among the co-operating countries as a means for providing increased outlet for agricultural products thereby securing additional incentives for expanding production and means for increasing personal and national income.

18. For several reasons, the pilot project has covered also agro-industries, particularly the food processing industries. Firstly, in some cases, crop production is automatically linked to processing as, for example, sugar-cane and tomato. Secondly, some other crops are better stored and transported in processed form so that their role in intercountry trade and in the promotion of agricultural development necessarily includes their role in processed form. This is particularly the case for cassava (cassava pellets, garri, starch and flour), yams (yam flour and flakes) sorghum/millet (flour and couscous) and maize (maize flour and flakes). Thirdly, industries provide the main outlet for some crops so that a full analysis of their utilisation and of the expansion of their production needs to include their utilization for industry. Such crops are cotton and other fibres. Agro-industries provide a necessary complement to crop production and the dynamic role of the latter in economic development can not be fully analysed without the former.

19. The pilot project was limited to only three countries, namely, Dahomey, Niger and Nigeria. The field work was undertaken in Nigeria in November-December 1973 and in Dahomey and Niger between February and April 1974. The study was undertaken with ECA and FAO regular programme resources and some bilateral assistance given through ECA. The three Governments, besides placing their experts at the disposal of the project team for consultations, also provided counterparts and internal transportation and helped to assemble the data. On the completion of the field work, a document embodying a general summary and the main recommendations of the project was prepared for the Eighth FAO Regional Conference for Africa held in Mauritius in August 1974. The present report has benefited from the comments made by the Conference and also the comments made by various ECA and FAO Divisions on the Conference document and on the draft of this report.

20. The study was undertaken by the Joint ECA/FAO Agriculture Division. However, specialists from the FAO Regional Office for Africa and from the ECA Transport Division assisted the project team. In addition, two bilateral assistance experts in the fields of food industries and livestock supplied to ECA by the United States Agency for International Development (US-AID) participated fully in the study.

## II. THE OBJECTIVES OF CO-OPERATION FOR AGRICULTURAL DEVELOPMENT

21. Economic co-operation in Africa has been promoted primarily with a view to providing a bigger market for large-scale production. This has been considered necessary in view of the small size of most of the countries coupled with the low per capita income, which together make the demand for most commodities low and their markets small, at least compared with developed countries. By grouping the countries together and pooling their small markets, it becomes possible to establish large-scale industries and thereby reap the benefits of economies of scale. This is particularly necessary for those industries that are inevitably large-scale.

22. This objective applies to the production of such crops as sugar-cane and tomatoes that are directly linked to industries as well as to forestry for pulp and paper and to agro-industries in general. It will, however, be shown later that large-scale establishments, which are often capital-intensive, do not effectively promote industrialization and, generally, economic development. Economic development is best achieved through activities that contribute greatly to national income (or personal income) and which lead to linkages thereby promoting further economic activities and increases in personal and national income. The large-scale establishments that are capital-intensive utilize limited local labour and sometimes also limited local raw materials. The value of production of such industries is, therefore, largely spent for the repayment of capital, the payment of interest and of salaries of non-local personnel. Much of the value of production thus seeps out of the economy and therefore adds relatively little to economic development. It is a well known fact that many an African country has had balance-of-payments problems, and the export of capital is now almost outstripping the import of capital. Most of the gains from industrialization and large-scale establishments have not been retained in the economy. It is, therefore, very doubtful whether the bigger market objective for the promotion of economic co-operation is appropriate for the African economies at present when the capital goods and much of the capital are imported.

23. There are, however, cases in which large-scale capital-intensive production is inevitable. Under a properly oriented industrialization policy, such cases are limited. The sharing of markets for such industries can be arranged through bilateral agreements and will not provide a sufficient basis for an economic grouping. Co-operation for such industries can better be undertaken in a wider framework that includes other industries than merely sharing such industries among the co-operating countries.

24. Another objective for promoting economic co-operation is to provide the opportunity for specialization and thereby reap the gains from greater efficiency that results from specialization. This has been the basis for the classical international trade theory and also for the classical customs union theory. Specialization is promoted when, in an economic grouping, each country concentrates on the production in which it has the greatest absolute or relative advantage and exports its surplus products to other countries in return for the products for which it has the least advantage. By this concentration on the most efficient production, total output is increased at relatively lower

cost to the benefit of all the partners in the economic grouping. Through such specialization, economic development can be promoted at a faster rate than if each country were to extend its production to the areas in which it has least advantage or efficiency with consequent relatively high cost of production.

25. While this principle is basically sound, several problems arise with regard to its practical application. The principle is based on certain assumptions, including equality between private marginal and social marginal products, free mobility of the factors of production between the countries in the grouping or non-rigidity in the returns on the factors of production, full employment and optimum allocation of resources and no change in technological knowledge. All these assumptions are generally unrealistic. Many establishments are monopolies or quasi-monopolies so that the private marginal product is often not equal to social marginal product. Also the political and social conditions are such that there is limited mobility of factors of production or flexibility in the returns on factors of production. Indeed, in the economies where private foreign investment is dominant, countries that have climatic and other living conditions that are favourable to foreigners are, all things being equal, preferred to the countries that do not have favourable conditions. This militates against the allocation of establishments in accordance with the least cost principle. Of special importance is the assumption of no change in technological knowledge. The motive factor for economic development is technological knowledge and, the more this expands or intensifies, the faster the country develops. If a co-operation arrangement does not take this change in technological knowledge into account, it cannot promote rapid economic development.

26. While there are these basic practical problems in the application of the principle of comparative advantage and specialization, this principle none the less provides a good basis for the promotion of co-operation, provided it is applied in the form in which these practical problems can be surmounted or obviated.

27. Specialization can be promoted by exploiting the complementarity that exists among the co-operating countries. Most of the African countries south of the Sahara lie within the tropics and consequently have similar climatic conditions and generally produce similar agricultural products. Detailed study, however, indicates that there is a considerable amount of complementarity. The most obvious is extensive livestock production in the Sudano-Sahelian zone and relative absence of livestock in the tropical forest zone resulting from the prevalence of the tse-tse fly and the limited availability of pastures. The Sudano-Sahelian zone thus has the possibility of exporting meat to the tropical forest zone. The latter, on the other hand, has much greater forest resources than the former and can therefore export timber and other wood products in return. This return movement, however, has as yet not offered great prospects in view of the bulkiness and weight of some of the products coupled with inadequate transportation facilities and the trade links with developed countries. The Sudano-Sahelian countries are endeavouring to expand savannah forestry with a view to achieving self-sufficiency in wood and timber. Nonetheless, in a well-organised programme of economic co-operation, industrial wood, plywood, pulp, paper and board, furniture and other wood products can constitute important export products from the tropical forest zone to the Sudano-Sahelian zone.

28. Besides this complementarity engendered by climatic factors, there are also the complementarities that result from differences in soil conditions, in altitude and in rainfall regimes. For example, the terre barre soil in Dahomey is more suitable for maize production than other soils in the same latitude or with similar climatic conditions in Nigeria. The rainfall regime in southern Dahomey which extends to southern Togo and Ghana does not favour rain-fed rice cultivation compared with areas in similar latitudes in Nigeria and other coastal countries of West Africa.

29. Weather variations also give rise to complementarity. With localized rainfall shortages or the over supply of rains resulting in crop failures, a country may find itself needing to import food products which it has not been importing. This situation is magnified when there is widespread drought as at present. Through a co-operation arrangement, the affected countries will be able to utilize the surplus products from their partners and such imports will generally be less costly than the food products imported from more distant countries. Moreover, if such weather variation is expected to last long, the farmers in the affected countries could temporarily move into the neighbouring countries and assist in expanding production to the benefit of all the countries.

30. These complementarities provide a very important basis for co-operation for agricultural development for the countries studied and also for other parts of Africa. The co-operation scheme, however, needs to be such as to permit the exploitation of the changes in weather conditions and in production technology; it should not be the allocation of products or quantities of products to individual co-operating country since this would not be sufficiently flexible for the exploitation of complementarities and changes in technology.

31. Self-sufficiency in food supply has been the objective of agricultural development policy in most African countries. While such an objective is necessary in order to avoid the over-dependence of one country on another for the supply of such essential commodities as food products, the objective has a limited optic and may retard long-term agricultural development. The two policies of full exploitation of agricultural potentials and self-sufficiency in food and agricultural products are rather conflicting. Full exploitation of agricultural potentials automatically necessitates intensification of the production for which a country has the potentials, while self-sufficiency requires expansion of production even in cases where the country does not have sufficient potentials. Such an expansion of production may, therefore, be achieved at high costs while the full potentials for the other products are left unexploited. Instead of a declared self-sufficiency policy, it is better to ensure that a co-operation arrangement permits full exploitation of the food resources and, at the same time, avoids the problems associated with over-dependence on other countries for the supply of food products. This objective can be achieved by a co-operation arrangement that is centred on the holding of common food reserves linked to a price policy aimed at expanding production in accordance with resource potentials.

32. It needs to be emphasized that, with the expansion in agricultural production, co-operation becomes inevitable. Expansion of agricultural production will necessarily result in surplus production for which external markets have to be found. Such markets, especially for the traditional food products, may

not readily be found without a co-operation arrangement, especially if every country pursues a policy of self-sufficiency. Moreover, the existence of an assured market outlet within an economic grouping in turn promotes the expansion of production and agricultural development in general. The fact that the developed countries are interdependent in the supply of agricultural and food products underscores the need for co-operation for the promotion of full exploitation of agricultural and food production resources in Africa.

33. Economic co-operation among African countries is also promoted with a view to facilitating the pooling of resources and more effective and efficient utilisation of the resources. This is particularly important with respect to the facilities for basic research, including seed multiplication, as well as training facilities. Co-operation in these fields also facilitates exchange of information and experience. Such objectives are being realised in the West African Rice Development Association (WARDA) and the East African Agricultural and Forestry Research Organization (EAAFRRO), for example. Related to this is co-operation for combating livestock and crop diseases and pests that transcend national boundaries. Many intra-African organizations have been established for this purpose, including OICMA and CCLALAV, but there are still possibilities for extending such co-operation, especially with regard to tse-tse fly eradication which can best be achieved on a regional basis. Similarly, resources could be pooled for the exploitation of the resources of the sea.

34. Of special importance is co-operation for the expansion of inter-country trade. Trade is promoted through bilateral agreements. The Phase I study on intra-regional co-operation and trade in the field of agriculture <sup>2/</sup> indicated possible surpluses and deficits of agricultural production in individual countries up to 1985, which could form inter-country trade. Experience has shown, however, that bilateral trade agreements have not been sufficiently effective. Since most of such trade is in the private sector, this is not surprising. Private traders, both foreign and local, sell or purchase where they have, or expect to have, greater benefits in the form of favourable prices, payment arrangements, payment facilities, etc. These benefits are generally lacking in African countries compared with the developed countries. Economic co-operation is necessary for the development of the facilities for the promotion of inter-country trade. Moreover, trading arrangements in African countries are made more difficult by the fact that they are often not linked to policies for the expansion of production. Consequently, supplies are limited and purchases small and, therefore, more costly to arrange. In an economic grouping with a single market, on the other hand, trading arrangements are facilitated. Indeed, the co-operation scheme could be such as would reduce trading problems to a minimum and greatly enhance the movement of commodities among the co-operating countries.

35. Such trade expansion can be effected for commodities that are produced in the co-operating countries at costs higher than international market prices but lower than the import parity prices for the products. Such products can not compete in the international markets but can compete in the markets of the co-operating countries with the products imported from outside. Through co-operation and intercountry trade, such commodities can be interchanged among the

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<sup>2/</sup> The original title of the present project.

co-operating countries to the mutual benefit of both the producing and the importing co-operating countries. Under this group of commodities are maize, rice, sorghum/millet and many processed and other agro-industrial products. For such commodities, co-operation promotes their production and facilitates the expansion of production and increases in income and, generally, economic development. With such pooled markets for the commodities and the consequent increase in production, the unit production cost could be lowered through continued application of improved technology as production expands or, in the case of agro-industries, through increasing the scale of production, and the products could then compete in international markets.

36. The importance of such co-operation for the promotion of economic development cannot be over-emphasized. African countries can not at present effectively compete in the international markets for most products. In some cases, it may even be appropriate to protect the markets for such products in the economic grouping in order to facilitate the expansion of their production, especially where such an expansion has secondary benefits, including linkage effect for the expansion of production in other fields. Indeed, the existence of more developed and industrialized countries side by side with the African countries necessitates that industrial development and, to some extent, agricultural development in Africa be developed under protection in order more effectively to develop local production capacity. As capacity increases and production expands, the protection could gradually be abolished.

37. It should be noted that, while most African countries are already applying such protection, the industries being protected are hardly those that help to develop local production capacity. For the protection to be beneficial to the economy, the industry or industrial establishments protected need to be those that utilize local raw materials and manpower resources and those that can readily promote local entrepreneurship; otherwise the gains to the country concerned will be minimal. Indeed, some of the existing protection has only resulted in increasing the profits and income of the foreign investors and these profits and income are sooner or later and in one form or the other repatriated, while the local consumers pay the high prices for the products from their meagre income. Indeed, such protection has resulted in transfer of local income to profits, interests and income of foreigners. As a result, the economy continues to stagnate.

38. The classical customs union theory holds that trade diversion effected through co-operation as indicated above is a loss to world welfare and to the total national income of the economic grouping. Some writers like C.A. Cooper, B.F. Massell, Andic and D. Dosser have, however, indicated how such trade diversion can be beneficial to the economy of the developing countries. It needs to be emphasized that, in African countries where the capital goods and much of the capital are imported and where the manpower resources are unutilized or under-utilized, imports are full cost to the economy since it is theoretically possible to utilize the unutilized or under-utilized resources for the production of import substitutes. Moreover, domestic production is a social cost only to the extent to which the factors of production utilized in the production are imported. Consequently, the comparison should not be between the low-cost (or low-price) imports and the high-cost (or high-price) domestic production, but rather between the former and the foreign component of domestic production.

If this foreign component is nil, the economic grouping has all to gain and nothing to lose by domestic production since this puts into productive use the unutilized and under-utilized local resources and also develops local production capacity; the national income is increased by the whole value of domestic production. The economic grouping sustains a loss in the total national income only when, for the production of given commodities, it has to import production resources to a value greater than the value of the same commodities imported from outside the grouping.

39. Inter-country trade in an economic grouping can also be expanded for the commodities that are produced at costs comparable to international market prices but which are substitutes for some of the products imported into the grouping. Thus, with the recent development in the utilization or partial substitution of cassava starch and flour or sorghum/millet flour for wheat flour in the making of bread and other bakery products, an opportunity exists for expanding the production of these commodities in the main producing areas for export to other areas for the substitution of imported wheat. Similarly, there is great opportunity to expand the production of, and intercountry trade in, cotton goods in substitution for imported textiles.

40. In addition to the groups of commodities indicated above, trade expansion within an economic grouping can also be effected for the products that have limited or no markets in developed countries but have markets in the neighbouring countries. Such products include cassava products for human consumption, yams, pulses and plantains. While these products are produced largely for local consumption (the so-called "subsistence production"), there are possibilities for expanding their production in some countries for supply to other countries, especially in processed form. For example, cassava production can be expanded in Dahomey and pulses in Niger for supply to Nigeria to supplement local production.

41. Thus the three main objectives of co-operation for agricultural development are the promotion of specialization for the exploitation of differences in natural resource endowments and other complementarities that exist among the co-operating countries; the promotion of full exploitation of agricultural and food production resources and the promotion of trade among the countries. The last is so much linked to production that mere removal of trade barriers among the countries and improvement of trading facilities are not sufficient for effectively exploiting the benefits of co-operation. Indeed, co-operation arrangements that have been limited to customs unions have not been successful in Africa. The arrangements need to extend to policies for expanding production in order effectively to reap the benefits of pooled and protected market and also ensure that the pooling of the markets and the accompanying protection do not result in a loss of income to the grouping or in benefits for only some of the members of the grouping. A fourth principal objective of economic co-operation is to pool production resources and thereby facilitate their full and effective utilization as, for example, with respect to research and training facilities, sea fishery development and combating common enemies in agricultural development, especially animal pests and diseases.

42. Thus, it can not be said that it is premature to promote economic co-operation among African countries since their economies have not developed sufficiently to open up areas for co-operation. Economic co-operation is for the promotion of economic development and it is no more suitable at a certain stage of economic development than at another; rather, what is necessary is the adaptation of the objectives and the bases for co-operation to the stage of economic development. Also, while each country can singly promote its agricultural development, these co-operation objectives indicate that such development can more readily be achieved through economic co-operation. There are, however, many difficulties in the achievement of economic co-operation in Africa.

### III. PROBLEMS OF ECONOMIC CO-OPERATION

43. In various quarters, the main problem of economic co-operation in Africa is taken to be the lack of political will to co-operate. Governments are said to be reluctant to take political decisions to co-operate. Consequently, while many proposals have been made and many meetings held for the promotion of economic co-operation, little has so far been achieved. The decision on economic co-operation has to be taken by the topmost policy makers; but it is necessary to draw a distinction between economic factors that militate against such a decision and mere political factors. It can be said that in Africa the greatest problem is an economic rather than merely a political one.

The main economic factors that militate against political decision to co-operate are the following:-

- (a) Economic relations with developed countries;
- (b) The reluctance to depend on other countries for the supply of vital products and services;
- (c) The fear that the bigger or more richly endowed countries will dominate the other members of an economic grouping; and
- (d) Economic nationalism.

44. The economies of most African countries are largely dependent on those of the developed countries, especially the former colonial Powers. Much of the investment in Africa is foreign, either direct foreign private investment or portfolio investment. In addition, there is much foreign technical assistance. Indeed, the dependency on the developed countries is such that many African Governments consider that they can not develop their economies without foreign aid. Governments, therefore, tend to incline towards the developed countries. This orientation is further reinforced by the concept of economic development which regards capital as the most important factor for economic development. Since the capital available in most African countries is indeed limited, the Governments direct their attention towards the sources of supply, the developed countries.

45. Economic co-operation, on the other hand, necessitates diversion of attention to the neighbouring countries in an economic grouping. Indeed, the eighth FAO Regional Conference in August 1974 stated that sovereignty over the economy was a precondition for economic co-operation among African countries. Such sovereignty can not readily be achieved under current economic development strategies and policies. The developed countries that give financial aid often tie the aid to the purchase of their products thereby making it difficult or even impossible for the receiving country to buy similar products from neighbouring countries. Even in the cases where the aid is not specifically tied, both the donor and the receiving countries often assume that the interests of the donor country should be preserved. The receiving country, therefore, endeavours to avoid undertaking measures that may jeopardize these interests.

46. On his part, the private foreign investor naturally fears competition from local entrepreneurs and generally tries to prevent such competition. Moreover, he seeks to further the interests of the metropolis in a similar way as foreign aid. In addition, he favours those countries that have the climatic and other conditions that are favourable to him. These countries, therefore, endeavour to promote and preserve his interests. Indeed, there is a sort of competition among African countries to grant the private investor the most favourable conditions. The decision to co-operate with neighbouring countries can not, therefore, be facilitated in such circumstances. This has, no doubt, contributed greatly to the limited success achieved so far in the promotion of economic co-operation in Africa. The problem is so acute that the sixth and the seventh FAO Regional Conferences for Africa had recommended that a study should be made under this project on economic relations with the developed countries.

47. In order to facilitate the decision to co-operate, co-operation proposals should either preserve the links with the developed countries, which implies including the developed countries concerned in the economic grouping, or else the proposals should be such as would enable the countries to obtain similar benefits from co-operation as they are getting from their economic links with the developed countries. The latter should not imply the elimination of financial and technical assistance and private foreign investment but, rather, providing the countries concerned with the basis on which they can effectively bring to the minimum the adverse influence of foreign assistance and private investment on measures for economic co-operation.

48. Among the African countries themselves, there is much reluctance to depend on other countries for the supply of vital products and services. Some progress has been made in the supply of electricity to neighbouring countries by both Ghana and Nigeria, but such measures are still limited. In agricultural production, there is a tendency for each country to strive to be self-sufficient in food production, and food production policies are formulated with this objective in view. It has been indicated that a self-sufficiency policy can be pursued only at a great cost to the economy since it will not permit full exploitation of agricultural and food production resources. If the co-operation measures are such that there is considerable interdependence among the countries concerned, the need for pursuing self-sufficiency objective may be reduced to a minimum.

49. Related to this is the fear of the smaller countries that they will be dominated by the bigger or more richly endowed countries in an economic grouping. This has contributed to the failure of the proposals for allocating large-scale industries among groups of countries. Since foreign private investors often favour the bigger and more richly endowed countries, there exist possibilities for such domination. The classical economists will propose that the smaller countries can gain under the comparative cost advantage principle, but it has been stated that there are major problems in the application of this principle. To eliminate this fear, co-operation proposals should provide equal opportunities for all the partners in a grouping, that is, equal opportunities to effectively utilize local resources and develop productive capacity. It can be said that if the co-operation measures are such that the bigger or more richly endowed countries depend on the smaller countries to a considerable extent and if they are also such that the smaller countries can not develop faster outside an economic grouping than within it, the fear of domination will be considerably allayed.

50. The reluctance to depend on other countries for the supply of vital products and services and the fear of domination both relate to economic nationalism. Economic nationalism, however, also refers to the desire of each Government to be free to pursue its own development policies. There is general reluctance on the part of African Governments to surrender this freedom. Proposals aimed at forcing them to give up a considerable amount of freedom have generally not been acceptable to them. This reluctance to surrender economic freedom needs to be accepted, just as the need to be economically independent of the developed countries. It therefore seems preferable that co-operation measures should be concerned with broad common policies within which each Government will be free to pursue its own economic and social development policies.

51. Besides these economic problems which militate against political decision, there is a related, largely financial problem of the sharing of the benefits that accrue from economic co-operation. These benefits are of two kinds, namely, the revenue from common customs and similar tariffs and the returns on common production and service establishments. In most African countries, the revenue from customs and similar tariffs constitutes a large proportion of Government revenue. Consequently, if the right of each country in an economic grouping to impose customs and similar duties is abolished, the revenue from common tariffs should be shared in such a way as to compensate each of the countries concerned adequately for the loss of its separate revenue. This will likely be done to the satisfaction of all the partners if it is considered as part of a package of co-operation measures. In such a package, opportunity could be seized to assist the smaller or poorer countries.

52. Similarly, with regard to the returns on common industries and services, the problem can be minimized if industrialization within the grouping is pursued under a general common policy which leaves sufficient room for each country to pursue its own special policies and share in the pooled market for its surplus products. If the common establishments are limited in number and, therefore, the returns on them constitute only a relatively small proportion of the benefits from co-operation, it will be easier to reach agreement on the sharing of the returns. The benefits that accrue from economic co-operation are not only the quantifiable financial benefits but also the not easily quantifiable benefits of being able to expand production, both industrial and agricultural, on an equal basis with the other members of the grouping and receive special treatment from, and share freely in the markets of, the grouping.

53. There are other very important problems of economic co-operation, chief among which are payments and transportation problems. These can be regarded as infrastructural problems. Their importance in promoting co-operation and in facilitating intercountry economic activities, including trade, has been widely recognized and action is already being taken both in ECA and in other African intergovernmental organizations to remedy them.

54. Underlying all these problems is the problem relating to the political will to adopt the policies and programmes that will facilitate economic co-operation and promote rapid economic development. If the Governments are committed to promoting and ensuring rapid economic development, they will explore all possible means for achieving this objective and, where necessary, make short-term sacrifices in order to achieve long-term and lasting benefits.

#### IV. THE PILOT PROJECT

55. These objectives and problems of economic co-operation have guided the organization of the pilot project. The objective of the pilot project is to explore the ways for promoting economic co-operation for agricultural and agro-industrial development in order to facilitate the achievement of the objectives of economic co-operation and, at the same time, surmount its problems. The project is, therefore, useful not only for the three countries studied but also for the other African countries. It has not been the intention to propose an arrangement for an economic grouping for the three countries; the recommendations are rather for general application, with modifications and adaptations to particular situations as necessary.

56. The choice of Dahomey, Niger and Nigeria for the project was made with a view to providing the framework for analysing how a big and richly endowed country (Nigeria) and much smaller and less richly endowed countries (Dahomey and Niger) as well as how coastal countries (Dahomey and Nigeria) and a land-locked country (Niger) can mutually benefit from economic co-operation. The choice also provides the opportunity for indicating the complementarity that exists between the countries of the tropical forest zone and of the sudano-sahelian zone.

57. An obvious way of promoting economic co-operation for agricultural development is to select some commodities that are produced in surplus quantities in some countries and in deficit in some other countries and bring the surplus - and the deficit - producing countries together to agree on how to harmonize production policies and expand production and exchange of the commodities among themselves. This approach is, however, rather too simple. The countries generally know which are the surplus and deficit countries, and the Phase I of this project was largely concerned with indicating such surpluses and deficits. The pursuit of self-sufficiency and the reluctance to depend on other countries for vital products will militate against reaching agreement among the countries on such a basis.

58. There are also important technical difficulties. Most of the field crops are produced in mixtures or in rotation with one another. It therefore becomes difficult to determine how much of each of the selected crops will be produced each year in order to ensure steady supply by the surplus producers and steady demand by the deficit producers and thereby assure the farmers of steady and good prices as an incentive for increasing production. This difficulty could be overcome if the countries concerned agree to hold reserves of the selected products for price stabilisation, but most of the food products have direct or indirect substitutes, the changes in the supply and price of which could nullify the effects of the price stabilization measures for the selected products. Moreover, price stabilization measures operate effectively when the producers can readily adapt production to changes in price by expanding production with increases in price and diversifying to other crops with decreases in price. If this adaptation is not effected, the reserves and the storage expenses may become too high as production increases, or difficulties may arise in arresting rising prices when demand increases faster than production.

59. Moreover, concentration on a few crops does not ensure best utilization of production resources. One of the causes of the present problem of food shortage in Africa is the concentration on the production of traditional export crops to the virtual neglect of food crops. Directing development policies on a few selected crops will have the effect of diverting attention from the other crops and this may result in shortages for such neglected crops and over-production of selected crops. In addition, there will be a tendency to extend production of the selected crops to marginal areas where other crops may have done better. The national income will, therefore, increase at less than the feasible rate.

60. The promotion of co-operation on a few selected crops helps to achieve specialization. Specialization can not, however, be imposed on the producers. In one of the three countries studied, such single crop policy is being pursued in some areas but it is reported that the producers sometimes utilize the fertilizers supplied for the selected crop on other crops. In such a case, not only will the fertilizer application on the selected crop be inadequate, thereby defeating the purpose of fertilizer distribution for the selected crop, but the application on the other crops will also be inadequate and may even be improperly done. Moreover, direct promotion of specialization in most African countries is rather premature now when the soil characteristics and farming systems are in most cases not yet analysed for the determination of crops or combinations of crops that are most suitable for a particular ecological zone, when high-level production technology is not yet applied and sufficient research has not been carried out on crop responses to inputs and to climatic conditions. It is, therefore, difficult to determine which country should specialize in what product or products and in what area.

61. Also this type of promotion of specialization does not make allowance for future changes in technology. A country may have deficit production of a crop today simply because the technique of producing the crop is low. With improvements in production techniques and with the possibility of research providing still more improved technology in future, that country may become a surplus producer of the crop. It cannot be overemphasized that measures concerned with the promotion of agricultural development should make allowance for future changes in technology since these changes are the motive factor for development. The promotion of specialization should better be undertaken by just establishing a framework which will allow specialization to develop as the knowledge of agricultural resources increases and farm technology expands and intensifies.

62. Of special significance is the question of whether agricultural development should be directed merely to increasing the production of crops or whether it should rather not be directed to assisting the peasants or farmers to improve their farm technology and become more productive farmers. Granted, if the production of crops increases, the peasants concerned have increased income, but a peasant who grows four or five field crops in mixtures and in rotation, as is commonly the case, may get confused if there are Government-supported programmes for expanding the production of, say, only two of the five crops, especially if the programmes are implemented by two different agencies. He is hard put to it to integrate the advice given to him for the production of the two crops into his farming pattern. He will find it difficult to answer such questions as how much land should be allocated to each crop, or crop mixture, which part of his farm is most suitable for each crop, how should the labour input of his

family be allocated to the crops in order to get the best possible return, etc. Indeed, the answers to such questions are what he needs most if he is to become a farmer able to stand on his own. Moreover, wrong answers to the questions will only result in his gross income becoming less than what is feasible. The programmes for improving peasant agriculture (or family farms) necessarily need to be directed to the family farm as a unit rather than to crops.

63. Such programmes directed to the improvement of the farm also have better chances of success. Indeed, one of the main causes of the failure to adopt research findings (or the separation of research from field or extension work) is that the research is based on individual crops in isolation whereas the peasants produce the crops in mixtures and in rotation. The research workers have not made attempts to understand the peasants' pattern of production with a view to exploring how this pattern can be improved.<sup>3/</sup> As a result, the peasants find it difficult to introduce the research findings into their farming pattern.

64. Indeed, experience in the countries studied indicates that, when the production of a single crop is promoted in an area, the peasants do not fully respond to the adoption of improved technology for that crop. This is because they are primarily concerned with ensuring adequate food supply for the family. Since marketing is not sufficiently improved they find it difficult to rely on the market for the purchase of food products even when they get higher returns from production of the selected crops. As a result, they tend to give divided attention to any programme for the expansion of production of a selected crop. Moreover, when the labour input requirement for this selected crop is in conflict with the labour input requirement for the other food products they give attention to the production of the other food crops in preference to the selected crops. This has resulted in partial failure of the programmes for increasing the production of selected crops. In some other countries, like Senegal, such programmes have been nearly complete failures.

65. It should be noted that combining the production of several crops in mixtures and in rotation has several advantages over sole cropping. Sole cropping often results in decreasing yields if cultivation becomes continuous, even when fertilizers are applied, whereas crop rotation maintains high yields and also provides some safeguard against insect pests and weeds and helps in soil conservation. Also crop mixtures often have higher returns than sole crops even under improved farm practices, and they also provide insurance against bad weather.

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<sup>3/</sup> A start is now being made to re-orient research programmes. The International Institute for Tropical Agriculture (IITA) at Ibadan (Nigeria) has embarked on the analysis of peasants' farming patterns and farming systems.

66. The disadvantages and difficulties associated with the promotion of co-operation for selected commodities are so great that this approach has not been adopted for the pilot project. Instead, attention has been directed to co-operation measures that embrace all the important crops and make it possible to improve the technique of producing these crops as well as to alter the supply of the products and the relative importance of the crops in the producing countries. Attention has also been directed not merely to crops and output but rather to the farm as a unit and to measures for upgrading the production technology and assisting the producers to become more productive, to expand their production and to become commercial farmers. As a result, supply projection in the orthodox method has not been attempted; instead, policies and programmes for expanding production have been analysed in consideration of available resources, and estimates of increases in production that can result from such policies and programmes made. Also, some special studies have been undertaken with a view to determining the most appropriate strategies for agricultural and agro-industrial development which can, at the same time, facilitate economic co-operation.

## V. STRATEGIES FOR AGRICULTURAL AND AGRO-INDUSTRIAL DEVELOPMENT

67. The special studies undertaken to determine suitable strategies for agricultural development are the following:

- Comparative analysis of the returns on food crops and the returns on the traditional export crops;
- Comparative analysis of the net additions to the national income from family farms and from large-scale agricultural production;
- Comparative analysis of the net additions to the national income from small-scale and from large-scale agro-industrial production.

### (i) Food crops and traditional export crops

68. Policies for agricultural development in Africa have been directed to promoting the production of crops that have good markets in developed countries, particularly cocoa, coffee, tea, cotton, groundnuts and oil palm. In the English-speaking countries, marketing boards have been established for internal purchase and export of these products. In the French-speaking countries, special agencies were established for the crops often with headquarters in Paris. Over the years, these boards and agencies developed fairly efficient marketing systems and established fairly adequate marketing and export facilities for the products. Priority was given to these crops in research programmes. Improved varieties of the crops were introduced and fairly adequate methods for combating pests and diseases were developed. The improved seedlings were multiplied and distributed to the farmers. Also fertilizers, pesticides and fungicides were distributed at subsidized prices and loans given to the farmers for the purchase of these inputs. International financial aid and loans were directed to expanding production of the crops. As a result, the increase in production was remarkable. In some countries, like Ivory Coast where French financial and technical assistance was liberally given, the increase in production was phenomenal.

69. Table IA indicates the increase in production of cocoa, coffee, cotton and groundnuts in some West and Central African countries. With such increases in production, the prices of these products in the last decade were very low. The price index (with 1957/59 = 100) for beverages and tobacco fell to 81 in 1962, remained around 90 for most of the years and suddenly rose to 101 in 1970; that for cotton fell to 84 in 1967 and rose to 91 in 1970; and that for vegetable oils and oilseeds fell to 91 in 1962 and moved up and down between 106/107 and 95 <sup>4</sup>/<sub>5</sub>.

70. Food crops, on the other hand, were generally regarded as "subsistence crops": they were to be produced simply for consumption by the producers themselves. The cash which these producers needed for other purposes had to

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<sup>4</sup>/ See FAO: The State of Food and Agriculture, 1971.

be obtained through the production of traditional export crops, generally regarded as the "cash crops". The peasants were expected to produce enough of the food crops for their need. Increase in production above this level was expected to depend on urban demand which was to provide the stimulus for increasing production and relatively little was done to promote production. As a result, the marketing of the food products has developed little and there are only few improved seed varieties and hardly any sustained programmes for the multiplication and distribution of available seeds. The increase in production has therefore hardly kept pace with population growth and food imports have increased in both value and volume.

Table IA. Production of traditional export crops in  
West and Central African countries  
(in thousand tons)

		1952/53-1956/57	1965/66	1971
		Average		
<u>Cocoa</u>	Ghana	245	416	470
	Ivory Coast	65	113	225
	Nigeria	106	185	257
	Cameroon	61	79	123
<u>Coffee</u>	Ivory Coast	75	273	268
	Cameroon	13	74	89
	Zaire	28	56	81 (1972)
<u>Cottonseed</u>	Dahomey	2	4	25
	Ivory Coast	3	9	28
	Mali	4	20 (1966)	42
	Nigeria	51	89	78
	Upper Volta	3	5	28
	Cameroon	8	38	28
	Chad	43	56	72
	Central African Republic	26	20	31
<u>Groundnuts</u> <u>inshell</u>	Gambia	58	120	108
	Mali	94	160 (1966)	145
	Niger	117	251	270 (1972)
	Nigeria	860	1,687	1,233 (1972)
	Senegal	605	1,124	960
	Cameroon	83	125	210
	Chad	96	150 (1965)	115
	Zaire	84	113	180

Source: FAO Production Yearbook.

71. Table IB indicates that the production of millet and sorghum, cassava and sweet potatoes and yams increased little between 1961 and 1971 in most of the main producing countries of West and Central Africa. Only in Ghana and Togo did the production of cassava and sweet potatoes and yams increase substantially, while millet and sorghum production increased considerably only in Upper Volta and Senegal. In a number of countries, production stagnated or even decreased. Only with regard to maize was there substantial increase in production in half of the countries. Table IC indicates that this slow increase in production resulted in substantial increases in cereal imports. The volume of imports more than doubled in nearly all the main importing countries within a period of only ten years (1961-1971). Only in Ghana, where the production of all the staple foods increased substantially, was there some decrease in imports. The overall result is that food prices have increased, and yet the peasants have not been able to expand production and benefit from the increase in prices.

Table IB. Production of staple food crops in West and Central African countries.  
(in thousand tons)

		1952/53-1956/57	1965/66	1971
		Average		
<u>Maize</u>	Burundi	90	110	250
	Cameroon	210	360	450
	Dahomey	165	210	175
	Ghana	170	280	380
	Nigeria	840	1,030	1,190 (1972)
	Zaire	320	250	350 (1972)
<u>Millet and Sorghum</u>	Cameroon	330	480	350 (1972)
	Chad	820	750	590
	Mali	740	800	900
	Niger	700	830	910
	Nigeria	4,580	5,940	7,400 (1972)
	Senegal	320	500	590
	Upper Volta	500	880	980
<u>Cassava</u>	Burundi	1,750	850	1,580
	Cameroon	950	700	950
	Central African Republic	1,480	1,000	1,100
	Dahomey	830	1,200	740
	Ghana	575	1,250	2,390
	Ivory Coast	440	1,100	570
	Nigeria	6,440	7,100	9,170
	Togo	360	990	1,170
	Zaire	7,060	6,460	10,500

Table IB (Continuation)

	1952/53-1956/57	1965/66	1971
	Average		
<u>Sweet Potatoes</u>			
<u>and Yams</u>			
Burundi	910	720	1,080 (1970)
Cameroon	150	235	330 "
Dahomey	630	570	600 "
Ghana	480	1,200	1,620 "
Ivory Coast	1,290	1,900	1,570 "
Nigeria	9,980	13,600	13,500 "
Rwanda	740	230	420 "
Togo	380	950	1,150 "
Zaire	350	300	350 "

Source: FAO Production Yearbook.

Table IC. Cereal import in West and Central African countries

	(Volume in thousand tons and value in \$US1000)					
	1961		1965/66(average)		1971	
	Vol.	Value	Vol.	Value	Vol.	Value
Cameroon	32	3,620	42	3,610	64	5,180 (1972)
Congo	13	1,350	18	1,600	31	2,200
Dahomey	7	790	17	2,020	22	2,280
Ghana	119	15,930	105	11,800	112	13,240 (1972)
Ivory Coast	83	9,200	169	18,160	181	14,540
Liberia	29	3,400	45	7,650	64	6,680
Mali	8	770	16	1,180 (1966)	26	1,900 (1972)
Niger	4	460	7	1,080	12	1,170 (1972)
Nigeria	118	11,370	160	16,360	392	33,270 (1972)
Senegal	198	17,870	268	25,800	361	31,430
Sierra Leone	19	2,080	49	2,950	60	6,000
Togo	5	620	12	1,340	17	1,300
Upper Volta	8	990	18	1,960	30	2,900
Zaire	63	7,200	170	15,760	223	18,020

Source: FAO Trade Yearbook.

72. This situation of low prices for export products and high prices for food products coupled with high food import bill indicates that the policies for agricultural development in Africa have been misdirected. Wheat imports constitute by far the greater proportion of cereal imports indicated in Table IC. The increase in volume is partly to make up for local food deficits but also partly because of increasing urban preference for low-priced ready-made food like bread. This preference has not been exploited to promote the substitution of local products for wheat in the making of bread and other bakery products. Also, too much distinction has been drawn between export crops and food crops often regarded as "subsistence crops". Of these so-called "subsistence crops" in Africa, maize, sorghum/millet and cassava (for starch and pellets) have international markets. If due attention had been given to increasing their production, the production technology would have improved sufficiently to bring their unit cost of production to international market prices. The other crops (yams, plantains and pulses) have markets not only in urban centres but also in the neighbouring countries. Moreover, other end-uses could have been developed for them; for example, yam-flakes, baby foods based on pulses and the utilisation of cassava starch and sorghum/millet flour for bread. There are really no subsistence crops.

73. High food prices and the rapidly increasing food import bills have now directed the attention of Governments to expanding the production of food crops. A study has been undertaken under the pilot project to indicate whether such a change in policy is justifiable economically and whether it would have been justifiable in the past.

74. In Table II, the costs and returns for the production of sorghum, maize and upland rice as food crops and groundnut and cotton as cash crops under traditional peasant agriculture in Nigeria in 1966/67 are compared. The production data for all the crops, except maize, are taken from a widely known study undertaken by Dr. D.W. Norman in northern Nigeria. Since northern Nigeria has not so far been an important maize producing region, the production data for maize have been obtained from the Western State Ministry of Agriculture and Natural Resources. Some adjustments have been made to the yield data and the yields in the Table are all average yields for the main producing areas of Nigeria. The objective is to indicate whether the main producers of these crops, and Nigeria as a whole, gained more from the export than from the food crops. While the main export crop in the area from which the maize data are taken is cocoa, maize has been included for comparison at the national level.

75. The data indicate that, under the prices ruling at the nearby markets or buying points, the farmers producing upland rice gained most with net returns per acre of about ₦18.5, followed by the producers of sorghum and cotton with net returns of ₦1.8 and ₦1.6 respectively. The producers of groundnuts sustained a loss of about ₦7 per acre at the ruling Marketing Board price. This shows that, contrary to current beliefs, the farmers in northern Nigeria gained more from producing food crops than from producing cash crops.

76. A comparison has also been made using international prices. These are based on f.o.b. prices British ports, less transportation costs to Lagos for export crops but plus the transportation costs for the food crops. (Insurance and similar costs have been overlooked). Such a basis for comparison has been chosen because, while the cost to the economy of not producing the food

products in the country is the import value of the food products - if the country does not produce the food, it has to import it - the cost to the economy of not producing the export crops is the export value of these crops. In other words, the gain to the economy from the production of export crops is the f.o.b. price Lagos port, whereas the gain to the economy from the production of food crops is equivalent to the loss that would have been sustained in importing the food products.

Table II. Costs and returns on food crops compared with export crops under traditional peasant agriculture in Nigeria, 1966-67

	(in Naira per acre)				
	Sorghum	Maize	Upland rice	Groundnuts	Cotton
Seeds	0.4	0.5	1.7	1.6	1.2
Labour	14.7	27.5	27.5	23.9	15.2
Total costs	15.1	26.9	29.2	25.5	16.4
Crop yields (lb/acre)	650	900	900	500 (decorticated)	500 (unginned)
Value of production (at local prices)	16.9	21.6	47.7	18.2	18.0
Net returns	1.8	-5.3	18.5	-7.3	1.6
Value of production (at import/export prices)	15.7	23.8	61.2	24.6	32.4
Net returns	0.6	-3.1	32.0	0.9	16.0

Source: Based on D.W. Norman's Survey of Three Zaria Villages, Institute of Agricultural Research (IAR), Samaru, and data from Western State Ministry of Agriculture and Natural Resources.

Note: Cost of labour is 11 kobo/hour. Local prices (Kobo/lb) are as follows:- sorghum: 2.6, maize: 2.4 and rice: 5.3, and Marketing Board prices for groundnuts: 3.3 and cotton: 3.6.

Estimated import prices of ₦ 54.1, ₦ 59.3 and ₦ 152.3 per ton are used for sorghum, maize and rice respectively and export prices of ₦ 100.1 and ₦ 145.2 per ton for groundnuts and cotton respectively.

₦1 = 100 kobo = \$US 1.5.

77. On this basis, the gains to the economy are about balanced. The highest gain is from upland rice with net returns of ₦32 per acre. The gain from cotton is also high (net returns of ₦16.0 per acre). The gains from groundnut and sorghum are about equal. Only on maize is there a net loss of about ₦3 per acre. This indicates that the national income did not really increase as a result of the greater attention given to the production of export crops.

78. The comparison is made on the basis of the situation that existed in 1966/67. It may be said, therefore, that if the production of food crops had increased more than was actually the case, the prices of these food products should have fallen and the gain to the economy from their production would not have been as high as indicated in the Table. It should, on the contrary, be noted that if as much research and promotional activities for increasing production had been undertaken for the food crops as for the export crops, the unit cost of producing the food crops could have been lower, any surplus production could have found ready outlet in international markets and the net returns could have remained high. This is, in fact, indicated in Table III. Moreover, the fact that sorghum and maize were imported from neighbouring countries and rice from more distant countries shows that the local market had not been saturated.

79. It should be pointed out here that paying the farmers the equivalent of international market prices (or export parity prices) for export crops could have adverse effects on the economy if this results in diverting production resources from food crops to export crops. The social opportunity cost is related to the value of food imports and not to the value of output of food crops at producer prices. If the equivalent of the international market price for the export crops is paid to the producers, the export crop producers may gain but the economy loses if the food import price is comparatively higher than the export price of the export products. It may, therefore, be better to link the producer price for export crops to the food import parity price, especially where there are possibilities of diverting production resources from export crops to food crops and vice versa. When the food import parity price is higher, the economy gains if the export-crop producers are paid lower prices in order to make them diversify to food crop production in substitution for imported food products.

80. It should also be noted that the marketing board price policies, perhaps unintentionally, helped to stabilize the export income from traditional export crops. These crops have low price-elasticity of demand. If the producers of such crops had been paid the equivalent of the export parity prices without any improvement being made in the prices of food products, they should have expanded the production of these crops more than they in fact did and food crops would have been neglected more. The international prices for export crops would have fallen considerably with increases in supply resulting in decreases in export value, as happened in the case of cocoa in 1965 and 1971-72, coffee in 1962-63 and 1967-69, palm oil in 1966 and 1968-69 and groundnuts in 1967-68.<sup>5/</sup> For tree crops, in particular, price stabilization policy is very necessary.

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5/ See FAO Commodity Review and Outlook, 1965, 1968, 1971/72 and 1973/74 and FAO Trade Yearbook, 1968, 1971 and 1972.

Table III. Costs and returns on food crops compared with export crops under improved practices in Nigeria, 1972/73

(in Naira per acre)

	Sorghum Sorghum	Maize	Upland rice	Swamp rice	Groundnut	Cotton
Seed	0.4	0.5	1.8	2.8	1.6	1.2
Seed dressing	0.1	0.1	-	-	0.3	-
Fertilizer						
Super phosphate	2.0	3.5	-	3.0	1.5	2.0
Sulphate of ammonia	1.6	4.0	1.6	6.0	-	1.6
Insecticidal spray	-	-	-	-	-	-
Labour	16.9	27.5	30.3	40.2	27.2	33.6
Total costs	21.0	35.6	33.7	52.0	30.6	42.2
Crop yields (lb/acre)	1270	1735	1335	2100	935 (decorticated)	745 (unginned)
Total revenue (at local prices)	44.5	52.1	93.5	147.0	37.4	44.7
Net returns	23.5	16.5	59.8	95.0	6.8	2.5
Total revenue (at export/import prices)	40.5	52.7	105.7	166.3	80.1	62.5
Net returns	19.5	17.1	72.0	114.3	49.5	20.3

Source: Based on data from Institute of Agricultural Research, Samaru. For maize the data are from "Production, Production Requirements, Costs and Returns of Crops: Southern Rain Forest Zone" - Ministry of Agriculture and Natural Resources, Western State (1972).

Notes: Labour is costed at 11 kobo/hr. The following retail prices at village level and marketing board prices for export crops are used (Kobo/lb): sorghum: 3.5, maize: 3, rice: 7, groundnut: 4 and cotton: 6. Estimated import prices of ₦71.4, ₦68 and ₦177.4 per ton are used for sorghum, maize and rice respectively and export prices of ₦192 and ₦188 per ton are used for groundnut and cotton (unginned) respectively. ₦1 = 100 kobo = \$US1.5.

81. Comparisons for the crops under improved production techniques in 1972/73 are shown in Table III. The Table contains data similar to Table II but with up-graded production technology and, therefore, higher yields for all crops. The net returns under local or marketing board prices are all positive. The net returns on rice production are very high indeed and those on sorghum and maize fairly high, while the returns on groundnuts and cotton are low. This is not simply due to changes in the prices of the products. At 1966/67 prices, the net returns on upland rice, sorghum and maize are ₦37.1, ₦12 and ₦6 respectively, while those on groundnuts and cotton are ₦0.3 and - ₦15.4 respectively. The benefits to the farmers of producing food crops rather than export crops (at marketing board prices) under improved farm technology are, therefore, clearly greater.

82. At the 1966/67 international prices (import prices for food products and export prices for export products), the net returns for upland rice, maize and sorghum are respectively ₦57.1, ₦10.3 and ₦9.7, while those for groundnuts and cotton are ₦11.2 and ₦6.1 respectively. The net returns on maize and sorghum are, therefore, about the same as the net returns on groundnuts while the net returns on cotton are appreciably lower. However, at 1972/73 prices, the net returns on groundnuts are much higher while those on sorghum, maize and cotton are about equal, indicating that the international prices of export crops rose faster than those of food crops. The high prices for export crops are, however, probably only temporary.

83. Table IV indicates a similar comparison with data from Dahomey but based on returns on labour. There, the yields of maize and cotton are higher than in Nigeria with the cotton yield being relatively a bit higher. However, in view of the greater application of fertilizers and insecticides required for producing the high yield of cotton, the returns are higher for maize than for cotton, both on the basis of value of labour input and on the basis of net returns per hectare after subtracting the cost of labour. Thus maize is obviously more profitable to the farmer in the Grand Hinvi region of Dahomey than cotton production. At international prices (using similar prices as in Nigeria), the returns are also higher. However, the net returns per hectare on maize after subtracting the cost of labour at 202 CFA F per man-day is only slightly higher than that on cotton.

84. Similar comparisons have also been made using actual data collected in a study on farm income and resource management made by the Ministry of Agriculture and Natural Resources, Western State of Nigeria. These are shown in Tables V and VI. The data in Table V indicate that in the rain forest zone of western Nigeria, maize/cassava (mixture) and cassava (sole) give higher net returns under both existing and improved farm practices than cocoa. The data on cocoa II are taken from the cocoa belt where yams give higher net returns, as indicated in Table VI. Also the labour costs are higher for all food crops than for export crops, indicating that they provide more employment and personal income than export crops.

Table IV. Comparison of the profitability of maize and cotton production in Dahomey, 1973

A. Maize production

Value of production on 2.4 ha. (two seasons) at 15 CFA F/kg	82,275 CFA F
Inputs: seed	750 CFA F
fertilizers	10,800 "
amortization and repairs for ox-drawn equipment	7,556
Total	19,106 "
Gross returns	63,169 "
Gross returns per hectare	26,320
Labour: no. of man-days/ha (two seasons) 130	
Value of labour per man-day using local price	202 "
Value of labour per man-day using international price	294 "

B. Cotton production

Value of production on 0.6 ha at 30 CFA F/kg	20,220 CFA F
Inputs: fertilizers and insecticide	4,190 CFA F
amortization and repairs for ox-drawn equipment	1,889 "
Total	6,079 "
Gross returns	14,141 "
Gross returns per hectare	23,568 "
Labour: no. of man-days/ha 176	
Value of labour per man-day using local price	134 "
Value of labour per man-day using international price	269 "

Source: Data obtained from Centre d'Appui Technique et Social (CATES) due Grand Hinvi (Co-opérative de Hinvi).

Note: The yields are 2,485 kg/ha and 2,300 kg/ha for maize and 1,123 kg/ha for cotton (unginned). International prices are the same as in Table III. \$US1 = 240 CFA F.

Table V. Costs and returns per acre on food crops compared with export crops, actual data from Western State of Nigeria, 1971/72

(in Naira)

Existing management

	Cocoa I	Cocoa II	Rubber	Yam	Maize/ Cassava	Cassava
Seed	-	-	-	34.3	1.5	1.6
Insecticides	3.1	3.1	17.6	-	-	-
Other costs	10.4	10.6	6.6	6.6	3.4	3.3
Labour	31.3	29.8	27.7	69.4	48.5	48.7
Total costs	44.8	43.5	45.3	110.3	53.4	53.6
Crop yield (lb/acre)	425	470	390	5779	655(maize) 5152(cassava)	6899
Value of production	55.6	62.5	47.1	118.0	74.2	67.2
Net returns	10.8	19.0	1.8	7.7	20.8	13.6

Improved management

	Cocoa	Rubber	Yam	Maize/Cassava	Cassava
Seeds	-	-	52.1	1.5	1.7
Insecticides	7.8	2.2	-	-	-
Fertilizers	12.5	-	3.1	11.3	12.1
Other costs	13.9	28.1	8.5	4.7	5.3
Labour	33.9	48.2	79.5	56.5	65.0
Total costs	68.1	78.5	143.2	74.0	84.1
Crop yield (lb/acre)	800	800	8355	850(maize) 10416(cassava)	13440
Value of production	104.6	96.6	170.6	132.7	130.9
Net returns	36.5	18.1	27.4	58.7	46.8

Source: The data are taken from "Production, Production Requirements, Costs and Returns of Crops: Southern Rain Forest Zone (Agricultural Resource Situation C), Western State of Nigeria", Ministry of Agriculture and Natural Resources, Ibadan, March 1972.

Note: The data are from the rain forest zone but data for Cocoa II from the central cocoa belt have been included for comparison. The central cocoa belt is also the best area for yams as indicated in Table VI. The returns shown in this Table are higher than those shown for the same ecological zone in Table VI because the cost figures in the latter Table include imputed rent for land use which has been omitted in this Table in order to make the figures comparable to those of Tables II & III. The following producer prices are utilized: cocoa 13.1 kobo/lb (or ₦ 293/ton), rubber (dry sheet) 12.1 kobo/lb (or ₦ 270.6/ton), yam ₦ 45.7/ton, cassava ₦ 21.8/ton and maize 3.7 kobo/lb.

₦1 = \$US 1.5.

85. The data in Table VI indicate that cocoa gives higher net returns than food crops only in resource situation A and slightly higher net returns under improved management in the cocoa belt. On the other hand, cassava/maize (mixture) and cassava (sole) under improved management give higher net returns in resource situation C while yams and cassava/maize (mixture) give nearly as high net returns as cocoa under improved management in resource situation B (the cocoa belt). Thus, even though the Western State of Nigeria is noted for cocoa production, the net returns to the farmer on cocoa have not been generally higher than the net returns on food crops. On the other hand, food crops (excluding maize as a sole crop) have higher net returns under both existing and improved management than the other export crops including oil palm but with the exception of rubber in the cocoa belt under existing management practices.

86. All these provide sufficient grounds to conclude that food crop production has been generally more profitable to the farmers than export crop production, when the marketing of food crops is improved as much as that of export crops. This holds both for the traditional peasant agriculture and improved farm practices. At international prices (import prices for food crops and export prices for export crops), the social returns on food crops have not been inferior to those on export crops and were even higher under improved farm practices. The unexpected rise in the prices of export crops by 1972 had, however, minimized the differences, but this rise in level of prices may be only temporary. On the other hand, it could be said that since the export volume of traditional export crops was much more than the volume of food imports, the countries might have benefited more by encouraging the production of export crops. At the same time, it should be noted that if balanced attention had been given to the production of export and food crops, the supply of the former might have been relatively low and the prices and export values high.

87. It can, therefore, be said in conclusion that the agricultural development policy in Africa, which hitherto had given priority to the production of traditional export crops, had not been a balanced policy. The national income could have increased more if as much attention, including finding other uses and external markets for food crops, had been given to the production of food crops as to the production of traditional export crops. While traditional export crops earn foreign exchange, food crops could have also earned foreign exchange both directly and indirectly through import substitution. Since traditional export crops cannot be grown in the developed countries (except in some parts of the United States of America), special encouragement has been given to the production of these crops. Food crops, on the other hand, compete with the food crops produced in the developed countries both in the markets of the developed countries and in those of African countries. Little encouragement has therefore been given to their production; instead, food crops are grown in the developed countries under subsidy and support prices. The agricultural and general economic development of the African countries have, as a result, been relatively retarded. It does not need to be emphasized that much greater attention should be given to the production of food crops than hitherto without neglecting the production of export crops.

Table VI. Gross and net returns per acre on export and on food crops  
In Western State of Nigeria, 1971/72  
(in Naira)

I. Resource situation A (Guinean savannah).

Crop	Existing management			Improved management		
	Gross receipts	Gross returns	Net returns	Gross receipts	Gross returns	Net returns
Cocoa	50.7	36.8	16.2	83.2	49.1	27.8
Cotton	21.5	14.7	-5.0	51.5	39.7	5.3
Yam	95.6	52.1	7.5	144.5	73.0	20.1
Maize	26.2	20.9	-5.3	43.8	28.2	3.0
Cassava	40.8	29.2	-2.1	82.6	56.1	15.2

II. Resource situation B (central cocoa belt).

Cocoa	62.7	45.3	15.5	132.8	94.7	61.9
Rubber	45.5	25.4	0.7	97.6	65.5	23.1
Cotton	27.9	18.6	-11.5	53.6	40.6	-8.2
Oil palm	-	-	-	74.9	26.1	9.6
Yam	119.0	73.5	23.2	175.9	109.4	51.2
Maize	33.0	27.1	-7.3	53.8	35.4	0.9
Cassava	49.8	39.8	-5.2	105.6	82.7	27.1
Maize & Cassava (mixed)	54.6	41.4	-4.2	118.4	101.3	53.2

III. Resource situation C (rain forest zone).

Cocoa	55.6	38.6	7.3	104.6	67.0	33.1
Rubber	47.1	26.0	-1.7	96.6	62.8	14.6
Oil palm	-	-	-	70.4	19.0	2.5
Yam	118.0	72.5	3.1	170.6	102.2	22.7
Maize	30.7	24.6	-13.7	53.4	34.8	-2.4
Cassava	-	-	-	130.9	107.2	42.1
Maize & Cassava (mixed)	74.2	65.8	17.3	132.7	111.8	55.3

Source: The data are taken from "Farm Income and Resource Management in the Western State of Nigeria", Ministry of Agriculture and Natural Resources, Ibadan, June, 1972.

Note: Data on oil palm under existing management have been omitted because the palms are in wild groves; the net returns are less than ₦1 or negative. ₦1 = \$US 1.5.

(ii) Family farm and large-scale agricultural production

88. The second special study undertaken under the pilot project has the objective of indicating whether the policy for expanding the production of field crops (both food and traditional export crops) should be based on family farms or on large-scale commercial production. The principle adopted in this analysis is the "social benefit-cost" principle. However, the orthodox analysis has not been utilized. Instead, a new approach is adopted in which all off-shore costs, including the income and profits of foreigners, are regarded as social costs, while the balance of the value of production is regarded as benefits.

89. This approach is justified on the grounds that the off-shore cost takes out of the economy a proportion of the value of production and this proportion is a loss to the economy. It does not add to the national income and it does not lead to linkages and other secondary benefits - it is a full cost to the economy. On the other hand, some items normally included as costs, such as labour costs and the cost of local raw materials, while being costs to the particular enterprise or establishment, are really not costs to the economy. In an economy where there is much unemployment and underemployment, as in the African economies, additional or fuller employment of local personnel results in value added to the economy: the national income is increased by the value of additional labour cost and this, in turn, leads to linkages in the form of demand for products either for consumption or for investment or both, with a consequent increase in production. Similarly, additional local raw materials or production inputs, after the off-shore costs for their production have been deducted, are value added to the economy. They provide additional employment, increases in personal and national income and linkage effects.

90. Generally, it can be stated that, until full employment is achieved, local labour costs and the local components of production inputs are benefits to the economy. With full employment, on the other hand, new industries can be established and old industries expanded only through the transfer of labour from existing industries and through capital intensification. The income of local labour will, therefore, largely be merely a transfer income; so will much of the value added.

91. Experience in Africa has shown that Government-operated large-scale agricultural production has generally not been successful. The agricultural production enterprises of the Development Corporations in Nigeria and the State farms in Ghana are only some of the numerous examples. Even mere tractor-hire services have not been successful. Several studies have been made to analyse the reasons for the failure of such enterprises. One of the chief reasons is that "Government work is nobody's work". Generally, the workers are more interested in getting their wages and salaries and, if possible, "extra-curricular incomes" rather than in ensuring that the enterprise operates efficiently. The terms of employment in governmental or quasi-governmental institutions which do not permit termination of appointment except for gross inefficiency help in promoting this attitude. Moreover, the workers are much concerned with hours of work whereas agricultural production, which depends much on weather, does not require set hours of work. The very slow process in obtaining supplies, especially spare parts, also adds to the inefficiency.

92. Private agricultural production, on the other hand, is not hampered by these problems. It is, therefore, generally more efficient. The Government, however, may not be able easily to promote private large-scale production. If it grants subsidies, this may encourage inefficiency. If it grants soft loans, this may not be enough to attract entrepreneurs into commercial agriculture since most people prefer to invest in industrial and service undertakings rather than in agriculture. Moreover, the subsidies and soft loans can be justified only if there are no better ways of increasing agricultural production.

93. In Table VII, the data taken from the farm income and resource management study in the Western State of Nigeria are utilized to compare the returns on medium-scale farms, which use a considerable amount of paid labour, with those on small-scale or family farms. Except for resource situation A under the existing farm plan, family or small-scale farms have higher gross receipts than the medium-scale farms, indicating that small farms have higher crop yields. Except for resource situation B (the cocoa belt) under the existing farm plan, they also have higher net returns (returns to management). They are, therefore, generally more efficient than medium-scale farm and probably more so than large-scale farms also.

94. Organizing the small farmers thus appears to provide a good approach to increasing agricultural production and transforming agricultural operations. Some policy-makers say that small farmers are difficult to organize; but this depends on the type of small-farm organization being promoted. If a Government agency, or a co-operative, prepares the land and supplies the necessary inputs and advisory services and also organizes the marketing of the produce while the farmers are left to operate their own individual farms, the organizational problems will be minimized. Since the small farmers will have all the proceeds after paying for the inputs and even for land preparation, they will have the necessary incentive to adopt improved technology and increase production.

95. The analysis in Tables III to VII has indicated that small-scale agriculture, or family farms, can be economically very profitable under improved management conditions. These improved management conditions can not be attained by the majority of the small farmers through extensive advisory service as is the practice in most African countries. They can, however, be attained through an intensive advisory service. In Table VIII A it is indicated that the cost of such an intensive advisory service is of the order of ₦5.4 per acre (about \$US 8 per acre or \$US 20 per hectare). This can easily be absorbed in the net returns for the production of most field crops. Even in cases where the deduction of this amount will result in negative returns to management, it should be noted that this expenditure is really largely a capital expenditure. Such an intensive advisory or extension service is an educational service which should be placed in the same category as the expenditure on education. It enables the farmers to acquire farm technological knowledge which yields long-term dividends. The annual cost should, therefore, be spread over a greater number of years. Normally, there is an administrative superstructure for large-scale or plantation agriculture. An intensive extension service can only be regarded as the counterpart of this administrative superstructure for the small farms. Such a superstructure is inevitable for agricultural development in Africa.

Table VII. Comparison of returns per acre on medium and small mixed farms in Western State of Nigeria (1971/72

(in Naira)

Existing plan

Resource situation	Farm size	Gross receipts	Non-labour costs	Returns to labour and management	Returns to management
A	Medium	45.0	16.2	28.8	4.1
	Small	43.5	15.3	28.2	4.5
B	Medium	46.5	14.7	31.8	6.6
	Small	52.9	16.4	36.5	6.1

Improved plan

A	Medium	57.5	24.4	33.1	9.6
	Small	71.9	29.1	42.8	13.7
B	Medium	65.9	22.4	43.5	18.7
	Small	87.5	26.3	61.2	27.3

Source: The data are taken from "Farm Income and Resource Management in the Western State of Nigeria", Ministry of Agriculture and Natural Resources, Ibadan, June 1972.

Note: The medium-size farms are between 30 and 45 acres and the small size farms are between 7 and 8 acres. The tree and arable crops are mixed in nearly the same proportions in each case. Resource situation A is Guinean savannah zone while resource situation B is central cocoa belt. ₦1 = \$US 1.5.

96. While family farms are economically very profitable under an intensive extension service, an attempt has been made under the pilot project to show that they also have, at least, as high social benefits as large-scale agriculture, assuming the latter is efficiently managed. The comparison is indicated in Table VIII. The data have been extracted from a feasibility study on semi-irrigated large-scale rice production in the Niger basin of Nigeria which includes satellite or out-grower peasant rice production. The levels of technology with regard to seeds, fertilizers and insecticides are assumed to be similar; so is the set-up for ensuring the application of improved technology. The irrigation and land preparation costs are higher for small-scale than for large-scale production because these costs include the interest on capital equipment and the cost of management. The cost for large-scale production, on the other hand, includes the cost of equipment and machine services and a large amount of salaries of administrative and supervisory staff which have been partially substituted for labour. The total labour cost is, therefore, quite low compared with the total labour cost for small-scale production.

97. As indicated in Table VIII A, the unit cost of production is less for large-scale than for small-scale production; the net returns on the former are, therefore, greater. This is the main advantage of large-scale production. It is therefore generally considered to be economically more efficient and more profitable than small-scale production. The cost and returns do not, however, indicate the impact of the operations on the economy. This impact is indicated in Table VIII B. There, all off-shore costs are regarded as costs and the balance as benefit. Since all the staff and labour are expected to be local, the staff salaries and labour costs are all regarded as benefits. This is likely not to be the case with regard to large-scale production where some of the staff are likely to be expatriates. Similarly, the whole net returns are regarded as local and, therefore, as benefits. In many large-scale enterprises, however, there will probably be foreign partnerships resulting in part of the net returns being repatriated and therefore accounting as costs. In addition, the yields are assumed to be less for small-scale than for the large-scale production. This is not likely to be the case under the intensive advisory service and the high level of technology assumed for the small farms, as shown by Table VII.

98. In spite of these favourable assumptions for large-scale production, the net social benefits are about equal and the benefit/cost ratio is higher for small-scale than for large-scale production. This indicates that, while the unit cost of production is lower for large-scale than for small-scale production and the net returns consequently higher, much of the value of large-scale production leaks out of the economy in payment for and in replacement of the capital equipment that has given rise to the low unit cost of production. The outpayment is even greater if the services of expatriate staff are utilized. While this is only an example, it is illustrative of the general situation. Once the extra outpayments are higher than the difference in the unit costs of production between large-scale and small-scale enterprises (family farms in agriculture), the economy gains more from the small-scale enterprise and the low unit cost of large-scale production does not benefit the economy.

Table VIII A - Comparative costs and returns of large-scale and small-scale rice production - Nigeria

(in Naira per acre)

	Large-scale	Small-scale
Irrigation cost	7.0	9.0
Land preparation	13.8	16.0
Interest on capital equipment	2.4	-
Other equipment and machine services	14.3	-
Inputs	49.0	49.0
Staff salaries/Extension staff	27.0	5.4
Labour	25.9	72.8
Total costs	139.4	152.2
Yield (lbs/acre)	3,000	2,800
Total revenue	214.4	200.0
Net returns	75.0	47.8*

Source: Based on J.K. Olayemi: "Feasibility Study of an Integrated Rice Plantation at Tada, Kwara State", NISER, Ibadan (1973).

Notes: Labour cost is ₦.7 per man-day. A yield of 3,000 lbs/acre is assumed for large-scale farms and 2,800 lbs/acre for small-scale farms. The price of paddy is ₦.80/ton. For small-scale farms, extension service is assumed at one agricultural assistant to 100 farming families or 250 acres and one supervisor to four agricultural assistants. The costs of land development and housing are excluded in both cases.

\* If the yield of 3,000 lbs/acre is used, the net returns will be ₦. 62.2. This is possible if there is intensive advisory service. The irrigation and land preparation costs to the peasants include the interest on the capital equipment and the cost of management of the operation.

Table VIII B. - Social benefit-cost analysis  
(in Naira)

	Large-scale		Small-scale	
	Cost	Benefit	Cost	Benefit
Irrigation cost	2.8	4.2	3.6	5.6
Land preparation	5.0	8.8	5.8	10.2
Other machine services	6.3	8.0	-	-
Interest on capital equipment	2.4	-	-	-
Inputs	44.1	4.9	44.1	4.9
Staff salaries	-	27.0	-	5.4
Labour	-	25.9	-	72.8
Net returns	-	75.0	-	47.8
Total costs	60.6	153.8	53.5	146.5
Net social benefit		93.2		93.0
Benefit/cost ratio	2.54		2.74	

Note: Off-shore costs are assumed to be about 90 per cent for capital equipment and fertilizers and about 20 per cent of the operating costs of the equipment.

99. There are, of course, other advantages which the development of family farms has over large-scale commercial production. Of special importance is the fact that it provides the opportunity for small-scale agricultural producers, as it were, to grow and become large-scale operators whereas they would have remained simply labourers under large-scale production. Moreover, once family farm production is seen to be profitable, there will be an incentive for young people to take to farming. This will help to solve the unemployment problem and reduce the rural exodus. In addition, such a policy ensures increased income for the low-income small farmers and helps in equitable income distribution.

(iii) Small-scale and large-scale capital-intensive agro-industrial production

100. This comparative study has been extended to agro-industrial establishments and the results are similar. For the data to be comparable, they should be from the same industry utilizing the same raw materials to produce the same end-product. Differences should, however, exist both in the size of operation and in the process but it is the difference in the process that is most important. It was not possible to obtain many sets of such data under the pilot project. Most of the establishments investigated either have similar type of process with variations only in size, or they have varying end-products. Only one example has, therefore, been utilized in the analysis.

101. This example is on palm-oil extraction processes and is taken from an IBRD Report on the Small-Holder-Oil Palm Estate Project in Midwest State in Nigeria. The data, tabulated in Table IXA, cover two small-scale, one medium-scale and three large-scale processes of sizes ranging from 40,000 ton - to 160,000 ton - capacity. The oil extraction rate for the small-scale processes is considerably lower than that for medium - and large-scale processes (160 kg compared with 220 kg per ton of palm nuts).

102. The financial costs-and-returns analysis shown in Table IXA indicates that the largest process (of 160,000 ton-capacity) has the least total cost per ton of oil and, consequently, the highest net returns. Indeed the returns per ton of palm nuts are nearly double those for the small-scale process. On the other hand, there is not much difference in the returns on the three large-scale processes which are all of the same type. This presents an obvious justification for large-scale establishments. The justification is, however, for the benefit of the private investor and not for the country as a whole.

103. In order to ascertain the social returns, "the social benefit-cost" analysis on the small-scale and on the 40,000 ton - and 160,000 ton-capacity large-scale processes is presented in Table IIB. The labour cost is highest for the small-scale and smallest for the largest-scale process - a ratio of about 11:1. The 160,000 ton-capacity process is indeed labour saving. On the other hand, the sum of depreciation cost, interest on capital equipment and the off-shore cost of fruit transportation (necessitated because of the larger area covered) for this process is about two thirds of the cost of labour saved. They more than cover the cost of labour saved by the 40,000 ton-capacity process. The gain in labour cost is, therefore, generally not to the benefit of the country; instead, it results in unemployment. The net social benefits are about as high for the small-scale as for the 160,000 ton-capacity process and the benefit-cost ratio for the former is much higher. If the capital is supplied from outside the economy, part of the net returns for the large-scale process will have been repatriated in the form of profits, thereby decreasing further the net social benefits and the benefit-cost ratio. It should be noted that the capital-intensive processes extract an extra 60 kg of palm oil from one ton of palm nuts than the small-scale labour-intensive process, but the benefit from this higher level of extraction goes to the manufacturers of the capital-intensive equipment that makes the high level of extraction possible. Moreover, the residus, which for the small-scale labour-intensive process contains more oil and, therefore, has more fuel capacity, is utilized as fuel for boiling the palm nuts.

104. The smaller of the large-scale processes (the 40,000 ton-capacity process) has the lowest net benefits and benefit-cost ratio. From the data, the Stock Junior Mill, which saves considerably on labour even more than the 40,000 ton-capacity process, has the least net social benefits and benefit-cost ratio. This indicates that if a capital-intensive enterprise has to be established, the larger the size, the better. Quite often, however, in view of the limited market and capital in most African countries, it is the smaller-scale capital-intensive enterprises that are established. The economy gains little from such enterprises.

Table IXA. Nucleus estate/small-holder oil palm project Midwest State: comparison of financial costs/benefits using existing palm oil structure system

	Hand	Press	Stock Junior mill	Speichen/de Wecker		
				12 tons/ hr.	24 tons/ hr.	48 tons/ hr.
I Oil mill capacity (tons of ffb)						
Per year	450	1000	5000	40000	80000	160000
II Acreage catered for Average collection radius from the mill (miles)	120	250	1,250	10,000	10,000	40,000
	0.5	1.5	3.5	10	14	20
III Production cost (£/ton of palm nuts)						
Management	1.0	1.0	1.25	0.53	0.27	0.18
Labour	6.5	6.5	1.25	1.33	0.80	0.59
Spare parts	0.2	0.22	3.60	1.03	0.54	0.46
Other costs	1.05	1.4	0.40	0.91	0.69	0.38
	8.75	9.12	6.50	3.80	2.30	1.60
IV Depreciation	0.25	0.18	3.90	2.70	1.90	1.50
Sub-total	9.00	9.30	10.40	6.50	4.20	3.10
V Fruit transport cost	-	-	0.45	1.05	1.60	2.30
Total cost	9.00	9.30	10.85	7.55	5.80	5.40
VI Oil palm products (kg/ton of ffb): Oil	160	160	220	220	220	220
Kernel	45	45	45	45	45	45
VII Oil palm revenue						
Oil £ 124/ton	19.8	19.8	27.3	27.3	27.3	27.3
Kernel £ 49/ton	2.2	2.2	2.2	2.2	2.2	2.2
Total	22.0	22.0	29.5	29.5	29.5	29.5
Returns/ton of palm nuts	13.0	12.7	18.65	21.95	23.70	24.10

Source: From an IBRD report.

Table IXB. - Benefit/cost ratios for processing one ton of oil

(in Naira)

	Hand Press		Speichen/de Wecker (40 000 ton capacity)		Speichen/de Wecker (160 000 ton capacity)	
	Cost	Benefit	Cost	Benefit	Cost	Benefit
Management	-	1.0	-	0.53	-	0.18
Labour	-	6.5	-	1.33	-	0.59
Spare parts	0.20	0.02	0.93	0.10	0.41	0.05
Other costs	0.70	0.70	0.45	0.45	0.19	0.19
Depreciation	0.18	-	2.70	-	1.50	-
Fruit transport cost	-	-	0.70	0.35	1.53	0.77
Interest on Capital equip.	0.46	-	3.04	-	1.59	-
Net returns	-	12.24	-	18.91	-	22.51
TOTAL	1.54	20.46	7.82	21.67	5.22	24.29
Net social benefits		18.92		13.85		19.07
Benefit/cost ratio	13.29		2.77		4.65	

Notes: Management is assumed to be completely local which may not be the case for the Speichen/de Wecker 160 000 ton capacity equipment and this will lower both its net returns and the benefit/cost ratio. Foreign components are assumed to be 90 per cent for spare parts, 50 per cent for other costs and 67 per cent for fruit transport cost. The interest on capital is assumed to be 8 per cent of the cost of capital equipment of ₦ 910 400 for hydraulic hand press, ₦ 6 084 000 for Speichen/de Wecker 40 000 ton capacity equipment and ₦ 3 184 000 for Speichen/de Wecker 160 000 ton capacity equipment required to process 160 000 tons of oil per annum.

105. The small-scale labour-intensive enterprises have other advantages over the large-scale, capital-intensive enterprises. For the latter to be viable, they need to operate at capacity and this is hardly achieved in the countries studied. As a result, many of such enterprises are operating at a loss. In view of their large size, there are often problems in the collection of agricultural raw materials. If the enterprises establish their own plantations in order to lessen the cost and the difficulties in collecting the raw materials, insufficient outlet will be provided for the output of the mass of small farmers and this will adversely affect the improvement in their production technique. In addition, the high distribution cost of the final products of large-scale enterprises tends to lower their net returns and the net social benefits. While it can be said that the low unit cost of such enterprises brings the prices of the products to the reach of the poor, it should be noted that this is, in practice, not often the case. In view of the problems mentioned above, the actual unit cost is generally high and the enterprises often receive liberal protection to maintain high prices for the products. It should also be noted that such enterprises require high level of management which is, at present, not sufficiently available in the countries studied and in most other African countries also. While such high level management can be imported, this is costly and, moreover, it tends to hinder the development of local entrepreneurship. Entrepreneurial ability is more easily acquired through small-scale than through large-scale enterprises.

106. Of special importance for economic co-operation is the fact that the bigger or more richly endowed countries are better placed for the establishment of large-scale capital-intensive enterprises than the smaller or less richly endowed countries. In view of the limited market even in an economic grouping, such enterprises often become monopolies and oligopolies and thereby deprive the less favoured countries of the opportunity to industrialize. Indeed, this situation often presents problems in an economic grouping since it gives rise to the fear of domination and even to jealousy. On the other hand, the preference for small-scale or labour-intensive enterprises for the promotion of economic co-operation does not imply that the bigger or more richly endowed countries will be asked to make undue sacrifices or that their industrial development will be retarded. As has been indicated, a developing African country has much to gain by promoting the development of such enterprises where labour-intensive processes are or can be made available rather than promoting the development of capital-intensive enterprises. In addition, this facilitates sovereignty over the economy.

107. The greater employment offered by the small-scale labour-intensive enterprises has been discussed above from the economic point of view, that is, in terms of greater personal income and greater additions to the national income considering that unemployment and under-employment characterize African economies. At the same time, the greater employment offered by the small-scale labour-intensive enterprises is also of great importance from the social point of view. The unemployed present a great social problem as is indeed evidenced in many African countries where robbery and similar crimes have become a great menace. They even threaten political stability. Industrialization of developing African countries that is based on capital-intensive enterprises is, no doubt, due to the economic link with the developed countries. The result is that while the economy is said to grow at a high rate, the mass of the people remain

poor and social problems increase. A re-orientation of policy in this regard is very necessary for arresting the social and political problems presented by the unemployed and for ensuring better income distribution and more rapid and strongly based economic development.

(iv) Livestock development

108. An important programme for the expansion of livestock production in the Sudano-Sahelian zone is livestock stratification programme by which the Sahelian zone will be largely concerned with the raising of young animals which will be sent to the Sudanian zone for rearing. By such a programme, there will be economy in the use of the limited pastures and livestock feed in the Sahelian zone while greater use will be made of the greater supply of pastures and water in the Sudanian zone and, as a result, livestock production will be increased in both zones.

109. It was not possible to undertake a detailed study of such a programme under the pilot project; only a preliminary investigation was made. This investigation revealed that the success of such a programme would depend much on the response of the pastoralists. The nomads will usually find greater problems in trekking herds composed of greater proportion of young animals than in trekking herds composed of greater proportion of adult animals. Of even greater importance is the readiness of the nomads to sell their animals. Even though they do sell their livestock, the sales are generally geared to cash needs. Indeed, they do not have much need for cash in their lives as nomads either for current transactions or as wealth. Livestock provides for them the visible wealth which they rightly prefer to monetary wealth. Consequently, it would appear that a stratification programme for the nomads can be successful only if it is combined with a sedentarization programme. As they become sedentary, they will have greater need for cash for housing, for the purchase of furniture and other durable consumer goods, etc. and will therefore be more ready to sell their young animals for cash.

110. On the other hand, a stratification programme among the transhumance pastoralists could be successful. These pastoralists are transitional between the nomads in the Sahelian zone and the sedentary stock owners in the Sudanian zone. Since their transhumance activity is promoted by the need to get pastures, they may more readily sell their young stock and be able to make more economical use of their limited pastures. A study of stratification programme in this respect will need to include an analysis of feed availability in both the Sudanian zone and among the transhumance population, animal health conditions particularly with regard to trypanosomiasis in the Sudanian zone and the marketing facilities in the whole region. The programme will be successful only if it results in increase in income both among the sedentary stock owners in the Sudanian zone who will purchase the young stock and among the transhumance population who will sell them.

(v) Conclusion

111. These special studies led to the conclusion that agricultural development policies need to be re-oriented to give emphasis to food production. Considering that the food crops subsector was relatively neglected in the past, the emphasis to be given to it in the future can not be too great. The emphasis should be on research directed to developing improved seed varieties and appropriate cropping

patterns and cultural practices, on seed multiplication and distribution and on organizational and institutional set-ups for increasing production.

112. In this respect, it is socially more beneficial to direct attention to the development of the farm rather than merely increasing the production of crops and to family farms and the small farmers rather than to large-scale commercial production. By this, personal and national income will be increased faster and equitable income distribution promoted. Moreover, there will be increased employment, farm production technology will be improved and agricultural production in general will be transformed. Such a policy will also facilitate growing the crops or combination of crops that are most suitable for an area as well as proper allocation and utilization of the labour input which, in turn, will help to increase output and income still more.

113. For these objectives to be achieved, it will be necessary to direct research on the farm with a view to finding out how to up-grade the present production pattern and what crop mixtures and crop rotations are most suitable for each ecological zone. It will also be necessary to establish an intensive advisory service which can effectively assist the small farmers to adopt improved farm technology and to become more productive farmers. This needs to be combined with appropriate input supply and marketing services. The present extensive advisory services have not been effective. The policy of slowly intensifying them, while being in consonance with the available manpower and financial resources, may yield very limited dividends. An advisory service can be effective only when the necessary level of intensity is reached. Before then, the expenditure may be wasteful. Consequently, it is preferable to establish in a limited area or areas the level of intensity of advisory service that can ensure effectiveness and extend the areas spatially as financial and manpower resources become available. This is an inevitable expenditure for the development of agriculture, but an investment that has high long-term dividends.

114. Similarly, the policy for agro-industrial development should be directed to small-scale and labour-intensive establishments or enterprises. This ensures greater efficiency in operation, faster increases in personal and national income and greater employment. It also ensures faster development of locally-based industries and sovereignty over the economy and provides an equitable basis for co-operation. In addition, it provides a better link with family farm agriculture which supplies the establishments with raw materials within a small area and thus helps in the transformation of small-scale agricultural production.

## VI. THE AGRICULTURAL SITUATION AND ORGANIZATION IN THE COUNTRIES STUDIED

115. Agricultural development in the three countries covered by the pilot project has been concerned largely with the promotion of the production of export crops: oil palm and cotton in Dahomey, groundnuts in Niger and groundnuts, cocoa, oil palm and cotton in Nigeria. Relatively little has been done about food crops. Moreover, except in Dahomey, little has been done to organize the mass of small producers and assist them to adopt improved farm technology. The result has been very low rate of increase in agricultural production and particularly in food production. In order to indicate the possible direction of future policy, it will be necessary to examine the actual situation and the method of organizing farm production in the three countries.

### (i) Basic data on the countries

	Dahomey	Niger	Nigeria
Size (sq. km.)	112,620	1,267,000	923,770
out of which			
- Land under crops annually	9,000	27,000	140,000
- Wasteland or desert	-	800,000	-
Total population, 1973 (million)	2.91	4.36	70.0
Rate of growth (% p.a.)	2.8	2.9	2.5
Agricultural population (million)	1.6	3.8	47.0
GDP, 1970 (\$US million)	230	300	7,400 (1970/71)
GDP per capita, 1970 (\$US)	85	72	114 (1970/71)
Agricultural GDP (\$US million)	96	170	3,300

### (ii) Dahomey

116. The economy of Dahomey is basically agricultural with more than 80 per cent of the population employed in rural activities. The available data show that between 1963 and 1967, the gross domestic product at current prices increased by about 4 per cent per annum. As prices increased at an annual rate of nearly 2 per cent and the population at 2.8 per cent, the real per capita income, which is one of the lowest in Africa (around 23,000 CFA francs), stagnated or even fell. Between 1967 and 1971, however, the gross domestic product increased at the rate of about 7 per cent per annum. This was due largely to favourable conditions in the world market for the country's export products and to increased investment in agriculture and industry as well as the transit trade with Nigeria during the Nigerian civil war.

117. Exports played an important role in recent economic growth in Dahomey and in reducing the chronic deficit in the trade balance. Oil palm produce occupies a prime place in exports although its share has decreased from about 53 per cent in 1966 to 34 per cent in 1971. On the other hand, the share of cotton in exports has been increasing remarkably from year to year.

118. In 1970/71, the trade balance with Nigeria, Niger and Ghana showed a surplus. It should however be noted that the surplus with Niger is decreasing since Niger is turning more and more to Nigeria and the deficit registered by Nigeria is primarily of a temporary nature.

119. According to available information on land use, 1,988,000 ha or about 17.6 per cent of the total area of Dahomey is arable land or range land. Woodlands and forests cover 19.1 per cent. More than half of the country still lies fallow and is not developed and only 10 to 12 per cent, or 1.1 to 1.3 million hectares, are used for annual or perennial crops. This shows that the land holds vast potential for increasing agricultural production.

120. From the point of view of climate, Dahomey may be divided into two zones: the southern and the northern zones. The southern zone has an equatorial climate. Two crops can be grown in a year without irrigation. It is the most suitable zone for maize, oil palm and cassava. The northern zone has a tropical climate with a considerable fall in temperature at night and less humidity than in the south. There are marked dry and wet seasons. Yams, sweet potatoes, groundnuts, sorghum and cotton are grown.

121. The southern part of the country is wooded and only in two northern departments, which are covered by thorn scrub, is there an appreciable amount of livestock (83 per cent of the total in 1970 according to official estimates). The south and a good part of the centre have a high incidence of tsetse fly so that only tripano-resistant cattle are found there. Some of these cattle are exported to the countries of Central Africa with high forests.

122. The trees of economic interest are samba, iroko and broad-leafed mahogany which are exploited for timber. In the savanna region of the country, the forested areas are of little economic interest. They do however yield some timber for local requirements and for firewood.

123. Around 100,000 persons in Dahomey depend on fishing directly or indirectly for their livelihood. Generally speaking, the fish situation in the lagoons and rivers is becoming increasingly precarious and hence traditional fishing is becoming less important while sea fishing is presently receiving very great attention from the Government.

124. The population of Dahomey was about 2.869 million in 1972. The annual growth rate is now estimated at 2.8 per cent. Most of the people are young: more than 45 per cent are under 15 and only about 5 per cent are over 60. This young and rapidly growing population augurs well for the economic future of Dahomey; but at present it means that half the population are consumers with very limited productive capacity. The population density reaches 135 persons per square kilometre in over 50 per cent of the departments.

125. Agricultural training is provided by two rural training centres and three modern agricultural colleges. Bearing in mind the drop-out rate, it may be estimated that 300 instructors in different rural specializations and 35 agricultural technicians are trained each year in Dahomey.

126. The soil is deficient in phosphates almost throughout the country. It should be noted that even on the most fertile land in the country, over-cropping has led to a gradual degradation of natural fertility. Furthermore, one of the criteria for distinguishing between the degraded lands and the non-degraded is basically that the former responds more to phosphate fertilizers. Thus, the exploitation of the phosphates which have been found in the lutetian soils of the country may be beneficial for the economy.

127. Since its accession to independence, Dahomey has implemented three successive plans (1962-1965, 1966-1970 and 1970-1972). It should, however, be noted that the plans have had relatively little impact. Many important projects were not included in any of the development plans whilst some others which were included remained a dead letter.

128. The current agricultural policy is contained in the general policy programme of the new Government. Within this general framework, priority is accorded to food crops which form part of the diet of the majority of the population. These include maize, sorghum, rice, cassava, sweet potato and beans, vegetables and fruits. At the same time, the products from which the country now derives substantial income, such as oil palm, coconut, cotton groundnuts and tobacco, are not neglected. To achieve this objective, new momentum is being given to organizing the small farmers to enable them participate to a greater extent in economic activities. This is being done through the "groupement" (pre-co-operative) system. Under this system, which is being promoted largely in the central and northern parts of the country, the small farmers are taught to organize for themselves the supply of inputs and the marketing of produce with a view to their developing into full-fledged co-operatives.

129. Agricultural production is being promoted by State-sponsored semi-autonomous societies which have the responsibility for individual "cash" crops either within a region or throughout the country. More recently, such societies or agencies have included the production of food crops in their activities. The Government has also established regional development agencies which should have the responsibility of promoting agricultural production and they are to work side by side with the development agencies responsible for individual crops. There is no large-scale agricultural production. Even the irrigation and special crop production schemes are for the peasants or the co-operatives. The development agency is responsible for organizing production through the co-operatives or pre-co-operatives by supplying improved seeds, fertilizers and insecticides, granting credit where necessary, supplying extension or advisory service and ensuring the purchase of the products marketed. The advisory service is intensive and averages one to between 120 and 150 farming families. As a result, appreciable progress has been made in the adoption of improved technology including the use of ox-drawn equipment.

130. The salient feature of the overall development of the Dahomean economy has been the rapid growth in recent years of agricultural production for export. The most noticeable feature has been the expansion of cotton growing: production increased almost six-fold between 1967 and 1972 (from 7,400 tons to 47,000 tons in five years). Also nearly 25,000 ha were planted by SONADER with selected varieties of high yielding oil palm of which 5,000 ha came into production

during the 1970-1971 season. In contrast, food crop production, which accounts for by far the larger proportion of agricultural production, has increased less. Although there have been some adverse weather conditions in recent years, the main reason for the relatively low rate of increase in food crop production compared with export crop production is that improvement programmes have been concentrated largely on export crops. It is only in the last few years that attention was directed to food crops and the programmes are taking time to become effective. Moreover, research has not been directed effectively to food crops.

131. Production techniques for food crops are still at a low level. Draught animals are only beginning to be used in the south. The increase in the production of food crops during the 1960s was due more to the expansion in area than to increase in yield. Available data indicate that between 1964-66 and 1970-72, food crop production increased by about 19 per cent whereas total agricultural production increased by about 30 per cent.

132. Even though improved varieties of some crops have been developed, they are generally not being grown yet. Research needs to be directed to discovering higher-yielding varieties of food crops in particular. Moreover, both the research and the programmes for agricultural development need to be directed to the farm. One of the problems experienced in cotton production was that the peasant sometimes applied the inputs supplied for cotton on their food crops. If the development programmes of the societies or State agencies are directed to the farm rather than to individual crops, the peasants will more readily integrate the new technology into their farming pattern and will also be able to organize their farms and their labour input with a view to maximizing their income.

133. Along with these, storage facilities need to be improved. Up to 30 per cent of harvest is lost in some areas because of inadequate storage facilities. It needs also to be considered whether the objectives of the "groupement" system can not be met in other ways since organizing the farmers into co-operatives has been, and generally is, a slow process. A minimum price scheme may help to ensure that the peasant is not exploited by middlemen. It should also be pointed out that since Dahomey and Nigeria produce similar food crops, co-operation in agricultural research between the two countries will be very fruitful.

### (iii) Niger

134. Despite the growing importance of mining in recent years, the economy of Niger still depends largely on agriculture. Between 1966 and 1969, agriculture registered an annual growth rate of 1.1 per cent. Apart from beans, bambara nuts and cotton, crop production fell during the period. In general, there has been an appreciable decrease in the share of the primary sector in the gross domestic product in favour of the secondary and tertiary sectors.

135. Trade with the sterling zone has been increasing recently. This is principally because, after France, Nigeria is Niger's second most important client. Although the share of groundnuts in total exports has been falling constantly, (33.6 per cent in 1972 as against 63.3 per cent in 1968) groundnuts still hold a dominant position. The export-import ratio reached

the record level of 83 per cent in 1972 which had not been equalled since 1961. This improvement in the trade balance is due to an export drive, but it should be noted that it has also been favourably affected by the export of uranium concentrates (2,369,000 million CFA francs for 411.38 tons).

136. Niger is a vast peneplain with an average altitude of 300 to 350 metres stretching over an area of 1,267 million square kilometres. Only 23.7 per cent of the total land area is suitable for agriculture since almost 70 per cent of the country is desert. The area under crop in the 1972-1973 season represented only 2.1 per cent of the total land area and only 17.8 per cent of the cultivable land. During the same period, irrigated farming was practised on 23,520 hectares, of which only one tenth was covered by irrigation grids. During the same period, 67.3 per cent of cultivable land lay fallow, an indication of the extent to which extensive agriculture is practised. Despite the low percentage of cultivable land in relation to the size of the country, there are great possibilities for increasing the amount of land under cultivation.

137. The agricultural part of Niger delimited in the north by the 350 mm isohyet enjoys a climate ranging from the Sahelian type to the Sudanian type with a well defined dry season. Agriculture and livestock rearing depend much on rainfall as regards both the quantity of precipitation and its distribution. The great damage caused to crops and to livestock during successive years of drought, especially in 1972-1973, are a good illustration of this fact. The land area which could be brought into use is estimated at 150,000 hectares, of which 50,000 are in the Niger valley and 100,000 in the Ader-Doutchi-Maggia area.

138. The chemical and physical composition of the soil varies greatly since the decomposed geological material is not uniform. With marked wet and dry seasons, the decomposition leads to successive changes and erosion, giving rise to two main types of soil. One type has good drainage (tropical ferruginous soil) and is suitable for the cultivation of beans, millet, sorghum, groundnuts, cotton and maize; the other (hydromorphous soil) has poor drainage with an excess of water and is suitable for the cultivation of rice, tobacco, sorghum, wheat and vegetables and also cotton and maize. The phosphates discovered in the Tahoua region may play an important role in agriculture in the future in view of the low phosphate content of the soil.

139. After crop production, cattle raising is the second most important economic activity. It employs nearly 20 per cent of the total population and accounts for around 15 per cent of the gross domestic product. With regard to fisheries, production was estimated at 8,000 tons of fresh fish in 1970 of which more than 7,000 tons were sold dried or smoked and some was exported to Nigeria and Ghana. It is estimated that the annual income from fish products is around 300 million CFA francs.

140. Forests are thought to extend over 600,000 ha. Some effort is being made towards reafforestation, but it is as yet not much. Between 1965 and 1972 a total of only 1,800 ha were planted.

141. Over 80 per cent of the population lives in the south where the average density is in the order of 30 persons per square kilometre. The annual population growth rate was estimated at 2.9 per cent between 1965 and 1970. It is expected that the rate will increase to 3.3 per cent between 1980 and 1990.

142. One of the major constraints facing Niger's development is the shortage of skilled manpower in agriculture, in particular, even at a time when there is unemployment among primary and secondary school graduates. This imbalance is partly due to the fact that the educational system is out of line with the needs of the economy. As of 31 December 1972, the number of technical advisers, agricultural officers, technicians, instructors and agricultural aids employed by the agricultural service amounted to 264, or one official per 1,500 farming families dependent on agriculture.

143. According to Niger's estimates for the decade 1970-1982, the primary sector will grow at an annual rate of 3.4 per cent. The development strategy aims at the achievement of two main objectives by 1982:

(a) Increasing food production with a view to feeding the population, producing improved seed, improving pastures for cattle, increasing exports and creating emergency food reserves; and

(b) Increasing the production of cash crops (groundnuts and cotton) with a view to increasing the investment surplus.

However, the constant decrease in groundnut and cotton production registered over recent years and the growing food deficit would make these projections seem rather ambitious.

144. On the whole, farming practices are still rudimentary in Niger. At constant 1972 prices, food crops accounted for a slight increase in overall production (0.37 per cent) between the period 1964-1966 and 1970-1972. On the other hand, groundnut production fell considerably (by up to 23 per cent) not only as a result of drought but also as a result of an ineffective agricultural development policy.

145. Research is directed mainly to selecting the best varieties of traditional crops, the introduction of improved varieties of millet and groundnuts and irrigated farming (water requirements, irrigation techniques and variety research). Appreciable results have already been obtained from agronomic research and widespread applications could lead to a very noticeable increase in production.

146. Agricultural production is mainly in the hands of small farmers who practise extensive farming in non-irrigated areas. There are also some special irrigation and rural development schemes. The peasants are being organized into co-operatives which are expected to be responsible for the organization of production and of marketing. The objective, like in Dahomey, is to promote the participation of the people in economic development activities. While the peasants are assisted to undertake marketing, so many deductions are made from the prices paid for their produce (groundnuts) that the income which they actually receive is rather low and this apparently has some disincentive effect. Moreover, the extension service is spread too thin to be effective.

147. A more effective policy is required for the development of agriculture. The peasants need to be organized in a more effective way and the necessary inputs and intensive advisory service provided. This should be combined with a better pricing scheme. The area development being tried in Tahoua region promises to offer the right basis for agricultural development in the country. It needs however to be evaluated, modified as necessary and extended to other main agricultural areas. Retraining the unemployed school leavers for agricultural work will minimize the wastage of man-power resources.

(iv) Nigeria

148. The rapid growth of the non-agricultural sector, especially the mining sector, has reduced the share of agriculture in the total GDP from 63 per cent in 1960 to 45 per cent in 1970 and it is estimated to have further declined to 35 per cent in 1973. This decrease has also been due to the very low rate of increase of about 1.8 per cent per annum in the value of agricultural production between 1960 and 1970 with an only slightly higher rate of increase in 1971-1972.

149. This situation has been reflected in exports also. Total exports increased by 149 per cent between 1964/65 and 1972. This increase was largely due to petroleum exports, the value of which increased from ₦ 184 million in 1966 to ₦1,157 million in 1972, or more than six-fold, and its share in total proceeds increased from 32 per cent to 82 per cent in the same period. On the other hand, while agricultural exports constituted 75 per cent of total exports in 1964/65, this proportion decreased to only 14 per cent in 1972. There were decreases in the production of the main export crops and falls in the prices of some of these products. The output of groundnuts, cocoa, palm products and rubber declined by amounts ranging between 17 and 5 per cent between 1964/66 and 1970/72 while that of rubber declined by more than 50 per cent.

150. The export of groundnuts and groundnut products declined from ₦110 million in 1966 to ₦ 45 million in 1971, that of palm products from ₦ 67 to ₦ 36 million, rubber from ₦ 23 to about ₦ 12 million and timber from ₦ 13 to ₦ 7 million. Only the export of cocoa increased from ₦ 57 million to ₦ 154 million and that of cotton from ₦ 10 to ₦ 11 million. Available data from 1972 indicate that there were very sharp decreases in these figures in 1972, except for timber. In some cases, like rubber, cotton and timber, the decreases in exports were due to increased utilization of the products for local industry. Such increased local utilization should, however, have provided the incentive for expansion in production in order to maintain the export market.

151. Imports of foodstuffs, beverages and tobacco increased by more than 77 per cent within the same period. While fish imports declined from about ₦14 million in 1966 to ₦ 3 million in 1972, sugar import rose four-fold to more than ₦ 21 million, wheat and wheat flour two-fold to ₦ 23 million, and milk products and other foodstuff from ₦ 20 million to ₦ 48 million. In addition to these, there is much unrecorded trade in food products. Up to 400,000 head of cattle are estimated to be imported into Nigeria annually from Niger and Chad in addition to thousands of sheep and goats. There are also considerable imports of fish from the upper reaches of River Niger.

152. Nigeria, with an area of 924,000 square kilometres, stretches from the humid equatorial zone in the south to the Sahelian zone in the north. It thus has a very varied climate suitable for practically all tropical crops. The rainfall ranges from over 3,000 mm. in some parts of the south to about 500 mm. in extreme north. The rainy season lasts for up to eight months in the south and the rainfall has two maxima which permit two crops a year under rain-fed agriculture. Towards the north, the period of rains decreases and the rainfall has only one peak. In the extreme north, only short duration crops like sorghum/millet and beans can be grown. However, no area is too dry for crops. On the other hand, the very heavy precipitation in the south causes much leaching of the soil and soil erosion. There are three main water-sheds and the country is well supplied with rivers. The Government is now planning to develop some of these water resources for agricultural production.

153. The soil is generally fertile. Up to 35 per cent can be said to be of medium to high productivity. These are the riverain alluvial soils, the ferruginous tropical soils (where these have not been over-farmed) and, to some extent, the lithosoils. With fertilizers, up to 50 per cent of the soils have good potential and another 25 per cent medium potential. Only 12 to 15 per cent of the area suitable for agriculture is annually under crops. This indicates the possibility for expansion of agricultural production. It is estimated that about 9 million ha., or about 9.5 per cent of the total land area, are forest reserves. Out of this, about 2 million ha. are tropical forest reserves while the rest are savannah forests with low yields of timber.

154. In the Second National Development Plan, 1970-74, agricultural production is projected to increase at the rate of 2.8 per cent per annum at constant prices. This is an improvement on the annual rate of increase of 2 per cent achieved between 1962/63 and 1966/67 but, considering that the population is estimated to be increasing at the rate of 2.5 per cent per annum, this projection is rather low. Agriculture is among the sectors given priority. The stated objectives include ensuring an adequate food supply to keep pace with the increase in population, expanding the production of export crops, increasing the production of raw materials for local industry and creating rural employment opportunities.

155. In spite of this emphasis, the rate of increase in agricultural production achieved in the 1970-73 period has been very low. The index of food production (with 1961-65 = 100) was 94 in 1966, 107 in 1970 and 109 in 1972, falling to 98 in 1973. The corresponding indices of per capita food production were 87, 90, 87 and 76 respectively. For individual crops, the production of sorghum/millet, maize, cassava and yams, the principal food products, increased by 9 to 13 per cent between 1964/66 and 1970/72. Only with regard to rice, the production of which increased two-and a half times, and pulses, with an increase of 46 per cent, were the increases substantial. The deficit in food production has partly been met from food imports which have increased substantially. For the same period, the production of export crops decreased appreciably. The indices of total agricultural production, however, remained at about the same level as those of total food production.

156. On the basis of the 1970 data, crop production constituted 78 per cent of total agricultural production, livestock 9 per cent, fishing 8 per cent and forestry 5 per cent. The Federal Livestock Department estimates that there are 8.5 million cattle in Nigeria. These constitute about 50 per cent of the current capital value of livestock in the country, sheep and goats constitute about 35 per cent, poultry 7 per cent and pigs, horses, donkeys and camels 8 per cent. One of the main problems of livestock development is the prevalence of the tse-tse fly in the Guinean savannah and the derived savannah of the central region of the country where pastures are luxuriant. There is also the need to improve pastures and to provide adequate water for livestock in the Sudano-Sahelian zone which is the main livestock producing region of the country. The Government has now embarked on tse-tse fly eradication programme by bush clearance and aerial-spraying. The Government also established in 1971 the Nigerian Livestock and Meat Authority for the development and better organization of the livestock and meat industry in the country. This Authority and the Federal Livestock Department are planning and executing programmes for disease control, expansion of production and improvement of marketing.

157. About 60,000 people are engaged in fishing, with an annual catch of about 156,000 tons (1972). About two thirds of the catch is made by traditional canoe fishermen who fish in inland waters, brackish water lagoons and inshore waters along the coast. The catch from inland waters, including Lakes Chad and Kainji, amounts to one third of the total catch. There is Nigerian coastal trawling based on Lagos, but this operates in shallow waters and fairly near to the coast. Distant-water fishing is largely by foreign vessels which land 20,000 to 30,000 tons of frozen fish annually. Future development needs to be directed to the training of local fishermen, the provision of credit and loans and the improvement of fish preservation and marketing.

158. In 1971, Nigeria produced about 3 million cubic metres of industrial wood from about 4 million hectares of closed forests and 54,000 hectares of hardwood forest plantations. Sawlogs, veneer logs and logs for sleepers constituted about 48 per cent of total removals. The forest industry is fairly advanced and a paper mill, which is using imported pulp, has been established at Jebba.

159. The policy for agricultural development has been centred largely on providing incentives to the farmers. That crop production has increased little indicates that the incentives have not been effective. There is on the average one extension agent to about 2,000 farming families. It is, therefore, no doubt difficult if not impossible to reach most of the farmers.

160. The Government is now giving greater attention to the promotion of food production. An Accelerated food production programme which will be directed to increasing the production of cereals and cassava is being planned. This programme is being based on selected crops and difficulties may be experienced by the peasants who combine the production of these selected crops with other crops. Moreover, under the programme, trials will be organized by the peasants themselves and this will likely be very costly. The small farmers need sustained advice on the application of improved technology and such advice

needs to be continued even after the farmers have selected the crops that give them high yields. Since it is the overall net returns on the farm that guide the reaction of the farmers, the latter need continued advice on adapting the cropping patterns to changes in weather and in market prices.

161. The Government is also planning water resources development schemes on a large scale. These schemes are inevitably long-term. The main thrust for the development of agriculture has to be on improving the production of the mass of the small farmers under rainfed agriculture. In this respect, a co-ordinated policy with the neighbouring countries will be necessary.

## VII. SCHEMES FOR ECONOMIC CO-OPERATION

### (i) Current economic co-operation schemes

162. There have been several proposals for economic co-operation in the countries covered by the pilot project. Dahomey and Niger are both members of the Conseil de l'Entente which was established in 1959 and whose objective is the harmonization and strengthening of the policies and economies of the member States on the basis of friendship, brotherhood and solidarity. The Conseil includes Ivory Coast, Togo and Upper Volta and has undertaken several studies for the promotion of economic co-operation among member States and also Ghana. Little progress has been made in this respect, but some investments have been made through the Mutual Aid and Loan Guarantee Fund which operates as a specialized organ of the Conseil. The Fund conducts and commissions studies and guarantees loans for major economic development projects and also promotes the establishment of joint undertakings like SORENTENTE (a tourist development company).

163. Under the Conseil, a Cattle and Meat Economic Community was established in 1970 to promote the production and marketing of cattle and meat within the member States and with third countries. This Community includes Mali, and Ghana and Nigeria have some association with it. It has undertaken some measures for the improvement of facilities for movement of cattle across the borders and for disease control. Some investment in livestock production is being channelled through it. In Dahomey there is a big project for livestock development in the central region which is being financed through the Community.

164. Dahomey and Niger are also members of the Communauté économique de l'Afrique de l'Ouest (CEAO) which in 1970 replaced the West African Customs and Economic Union (UDEAO). It embraces all the French-speaking countries of West Africa excluding Guinea and Togo. Its objectives are the improvement of distributive, transport, transit and communications infrastructure of member States, the promotion and acceleration of the industrialization of member States so as to bring about harmonious and balanced economic development among them, the establishment of free movement of persons and goods and the promotion of trade in agricultural and industrial products by the creation, inter alia, of a system of preferences and machinery for financial compensation. These objectives are comprehensive and are aimed at establishing a common market, but they have apparently presented problems and the Community is not operational yet. The Community is really a combination of two economic groupings: the Conseil de l'Entente (excluding Togo) and the Organization for the Development of Senegal River, both of which have similar objectives to those of the Community. It is difficult to see how the Community can work side by side with the component groupings.

165. Attempts have also been made to form an economic grouping embracing all of the West African countries. The most recent was the proposal promoted in 1973 by Nigeria and Togo for a West African Economic Community that cuts across language barriers. Intergovernmental ministerial meetings have been held and the constitution has been drafted. It is expected that the Community will be established by the middle of 1975.

166. Besides these groupings, there is co-operation for river and lake basin development. All the three countries are members of the Niger River Basin Commission which was established in 1965 but which has not been very active until recently when serious consideration started to be given to the development of river transport and hydro-electricity. Niger and Nigeria are also members of the Lake Chad Basin Commission. This Commission has been very active since its establishment in 1964. Besides the programmes for the development of the basin, more recently discussions have started on wider measures for economic co-operation, including co-operation for livestock development. Niger also co-operates with Mali and Upper Volta in the Liptako-Gourma Region Integrated Development Authority.

167. Specifically regarding the three countries studied, Nigeria and Niger have a bilateral trade agreement and have also signed a protocol establishing a Niger-Nigeria Co-operation Commission to undertake studies for the promotion of co-operation between the two countries. The secretariat of the Commission has been established but much work has not been done yet. Nigeria is also holding discussions with Dahomey for joint railway and road development and for sugar projects.

168. This short survey indicates that great efforts, in which the three countries have been involved, have been made and are being made to promote economic co-operation for various purposes. Drainage basin development is a simple basis for economic co-operation and has been relatively more successful than economic groupings. The number of proposals for the formation of economic groupings and the relative inactivity of the groupings already formed indicate that there are many problems to be overcome before effective economic groupings can be promoted. Even co-operation for drainage basin development has had limited success. There seems to be there but the way appears difficult.

169. The main problems of economic co-operation have been discussed in section III. The groupings that have been formed, or are proposed, aim at establishing economic unions or common markets. Economic unions or common markets are rather too advanced for the African economies. Free movement of factors of production will likely result in greater movement of these factors, including trained manpower, to the more developed or more richly endowed regions. There will be a tendency for a spiral growth in such areas and experience shows that there is little and very slow spill-over to other areas from poles of development. Those other areas, mostly in the poorer countries, will, therefore, be deprived of some of their factors of production and this will create greater development problems.

170. For these reasons, the study made for co-operation between Niger and Nigeria which proposes the establishment of a common market between the two countries has, at the same time, recommended special measures for the development of the Zinder area in Niger in order to counter the possible pull that will be exerted by the Kano-Zaria region in Nigeria on the eastern part of Niger. There appears to be some inconsistency in these recommendations. The main objective of a common market is to facilitate optimum allocation of production resources through the free movement of factors of production to the areas or into the activities in which they are most suited. If the framework that will facilitate this free movement is established and, at the same time, special measures are undertaken in some areas to prevent such a movement, the special measures are not likely to be successful since there will be two opposing forces in action in those areas.

171. There are other problems associated with economic unions or common markets. The movement of labour may not be associated with the availability of job opportunities as happens in most of the countries. There may, therefore, be a high level of urban unemployment with consequent social problems. As this takes place on the group-country level, the problems are likely to be more serious than at the national level. It should be noted also that the ruling wages are not related to marginal value products so that the optimization of output expected from free movement of labour will not be achieved.

172. The basic problem of economic development in most African countries is not necessarily that of resource allocation; it is rather that of production technology and the capacity to produce. Schemes for economic co-operation should, therefore, not be concerned primarily with optimizing resource allocation but rather with facilitating the adoption of improved technology and the development and improvement of the capacity to increase output and income. The concern should, therefore, not be so much with the establishment of a common market as with the orientation of development policies in such a way as would best promote the development of national capacities together with increases in national income and further enhancing the effectiveness of the policies through common or co-ordinated action with neighbouring countries that would prevent unfair competition from other countries, promote specialization with improvement in production technology and ensure a common outlet for the products. Moreover, countries are jealous of their sovereignty and want to be free to develop their economies in the way they consider most suitable. Indeed the ethnic groups in each country have not been moulded together. Consequently, co-operation measures which interfere considerably with the freedom and sovereignty over the economy may not readily win the support of the top policy makers.

(ii) Existing trade links between the countries studied

173. There already exists considerable movement of goods and people between Niger and Nigeria, Nigeria and Dahomey and Dahomey and Niger. The River Niger forms an important link between Niger and Nigeria. The river is navigable to Niamey for up to six months of the year. There are proposals under the Niger River Basin Commission and the Liptako-Gourma Authority to improve the navigability of the river. Besides the river, there are three road links between Niger and Nigeria - the road between Birni-Nkonni (Niger) and Sokoto (Nigeria), between Maradi and Katsina and Kano in Nigeria and between Zinder and Kano. All these are all-weather roads and are well maintained. Also the transportation cost is low, averaging 9 to 10 CFAF (about 4US cents) par ton/km.

174. From the information supplied by Direction des transports (Niger), about 43,000 tons of merchandise were transported from Niger to Nigeria in 1973 on these routes and about 90,000 tons in return. The drought situation, however, affected these figures: there was hardly any groundnut harvest in Niger, and some food aid was transported to Niger from Nigeria through the routes. In normal times, groundnuts, ground-nut oil, animal feeding-stuff (from groundnuts) sorghum and pulses are transported from Niger to Nigeria while salt, sugar, petrol and some manufactured products are sent from Nigeria to Niger. In 1972, Niger exported up to 59,000 tons of groundnuts (decorticated) through Nigeria compared with 23,600 tons exported through Dahomey.

175. Some problems are experienced by Niger in exporting groundnuts through Nigeria. The Nigerian railways can take only about 9,000 tons per month to Lagos so that the evacuation of groundnuts from Niger takes up to six months after each harvest. In addition, Niger pays relatively higher shorehandling dues at the port of Lagos than Nigeria - N1.8 per ton for salt, flour, milk, sugar and stockfish and N2.45 per ton for other products compared with N1.65 per ton and N1.85 per ton respectively paid by Nigeria for imports and N1.65 per ton for exports. (N1 = \$US1.5). It appears, however, that the port of Cotonou is competing with the port of Lagos in handling Niger's transit trade and grants a 30 per cent rebate on Niger's transit goods.

176. The boundary between Nigeria and Niger is very long and facilitates the movement of livestock, estimated at 250,000 head annually, from Niger into Nigeria. At the same time, it makes border control very difficult. In addition to the three road links already mentioned, there are other smaller routes between Niger and Nigeria east of the Zinder-Kano route. Much of the clandestine trade is undertaken over these routes. The routes also facilitate the movement of nomads and provide easy means of contact for the Fulah population living on both sides of the border in this eastern part. Passenger traffic between the two countries is quite high. Available data indicate that, in 1973, 66,000 persons were transported on the three main road links from Nigeria to Niger and 61,000 persons in return. The link between the two countries is thus quite strong.

177. The link between Nigeria and Dahomey is also very strong. The most important road link through which passes up to 90 per cent of the merchandise that is transported between the two countries is the road link between Porto-Nova in Dahomey and Lagos through Igolo and Idiroko. This road is bitumenized and well maintained. The other road link is between Ketou in Dahomey and Ilaro-Lagos, on the one hand, and Abeokuta and Ibadan (Nigeria), on the other. This is an earth road and not well maintained - it is hardly passable in the rainy season. The route is little controlled and it provides the means for clandestine trade, especially cocoa from Nigeria to Dahomey and drinks in return. In some years, from 5,000 to 15,000 tons of cocoa are exported from Nigeria through Dahomey. This happens when the producer price in Dahomey is higher than that in Nigeria. Also, some of the export is to pay for the products imported from Dahomey. The third road link connects Parakou in Dahomey to Nikki in Nigeria. It is an earth road but well maintained and good throughout the year. It also serves northern Togo.

178. There is no sufficiently reliable information on the volume of goods that are transported between Niger and Dahomey. When Nigeria prohibits food import or when import licences are restricted, considerable quantities of foodstuff, particularly maize and yams, are imported into Nigeria unrecorded. Also some manufactured products are imported both from Dahomey and from Togo unrecorded. The lagoons provide additional route for this purpose, as does the canoe traffic along the shore from Nigeria to Togo and beyond. From available information, 10,500 tons of merchandise valued at 381 million CFA francs (about \$US 1.59 million) were imported into Dahomey from Nigeria in 1971 through the Lagos-Idiroko-Igolo-Porto Novo route alone. About 4,110 tons of merchandise valued at 570 million CFA francs (about \$US 2.38 million) were exported in return.

179. Maize exports to Nigeria amounted to between 5,000 and 6,000 tons registered and about the same quantity unregistered. The value of food products exported from Dahomey to Nigeria in 1972 amounted to about \$US 100,000 or slightly more than the value of tobacco and also of cigarette exports, while the export of jute sacks

amounted to about \$US 375,000 and alcohol about \$US 75,000. The main exports from Nigeria to Dahomey in 1972 consisted of household goods (\$US 145,000), lubricating oil and diesel oil (\$US 115,000), fats (\$US 100,000), bicycles and accessories (\$US 83,000) and asphalt (\$US 63,000). Also, since 1974, Nigeria has entered into an agreement to supply Dahomey with 100,000 tons of cement annually at Lagos price. There is also unregistered trade, largely of cocoa exports from Nigeria and exports of other food products, particularly yams from Dahomey and some garri from Nigeria.

180. In view of the non-liberalization of trade, much of the trade between Nigeria and Dahomey is clandestine trade. The existence of several check-points on a road of only about 150 kilometres between Porto-Novo and Lagos further makes the movement of goods difficult. On the other hand, while the cost of transportation (about 5.7 US cents per ton-kilometre) is 40 to 50 per cent higher than that between Niger and Nigeria, it is sufficiently low for the promotion of trade between the two countries. Also the transport links are sufficient, although the Ketou-Illaro/Abeokuta road needs to be better maintained. The existence of the same ethnic group, the Yorubas, on both sides of the border further promotes economic and social links between the two countries, just as in the case of the Fulahs in Niger - Nigeria. The passenger traffic at about 500 each direction per day is about the same as between Niger and Nigeria.

181. There is only one transportation link between Dahomey and Niger. This is the road link between Parakou and Dosso, which is an extension of the railway from Cotonou. From Dosso, the road extends to Niamey and to the east of Niger. The road is bitumenized except for the section Abomey-Parakou in Dahomey which is an earth road but well maintained. The section from Parakou to Malanville (at the border) is, however, badly maintained and difficult in the rainy season.

182. The volume of merchandise in 1971/72 from Dahomey to Niger along this route was 127,000 tons and the return movement 93,000 tons. Out of these, the goods produced in Dahomey and exported to Niger amounted to only 5,000 to 6,000 tons, or slightly more than the export from Niger to Dahomey. In 1973, the volume of merchandise transported into Niger was 194,000 tons, including a large volume of food aid. The return movement was only 7,000 to 10,000 tons. Normally, uranium and groundnuts are transported from Niger while petroleum products and cereals are transported in the opposite direction. There is also considerable movement of livestock, largely unrecorded, from Niger to Dahomey. The transportation cost at about 15 CFA francs (6.25 US cents) per ton-kilometre is higher than that between Niger and Nigeria and between Nigeria and Dahomey. Since it is the only route and has less competition among transporters than in the other two cases, this is not surprising.

183. This route is one of the mixed transport links by rail and road which the Conseil de l'Entente has the responsibility to codify and plan. The extension of the Cotonou - Parakou railway into Niger is being proposed, but the cost may be too high and the possible traffic in the near future may not justify it. The existing link can be said to be sufficient for the volume of traffic and its capacity can be increased further through improvement, better maintenance, and more efficient utilization.

(iii) Recommended schemes for economic co-operation

(a) Removal of trade barriers

184. Much of the movement of commodities between the three countries is transit trade (export of groundnuts from Niger through both Nigeria and Dahomey, import of manufactured goods and petroleum products by Niger through Dahomey and Nigeria and import of manufactured products by Nigeria through Dahomey), but the exchange of locally produced goods is considerable. A greater proportion of the trade in local products is unregistered partly because the Governments have not allowed free exchange of the products and partly because the official payments channel for the imports are not easily available and involve delays of up to three months. The local currencies are, therefore, preferable to the small traders in spite of Governments' prohibition of currency exports.

185. As a result, it can be said that trade between the three countries can be increased considerably if trade restrictions are removed and payments arrangements facilitated. The removal of the trade restrictions will also remove the inconveniences experienced at check-points, including bribes. The differences in the prices of food products, as shown in Table X, further indicate how easily the trade between the countries can expand. Transportation cost will add about \$US 9 to the prices of the food products exported from Dahomey to Nigeria. This will make the prices of these products in Nigeria still much below normal import prices. The import price of rice from international markets is about three times the import price from Dahomey while those of maize and sorghum are respectively over 60 per cent and 80 per cent higher. In the case of cassava, exports should normally be in the processed form and the proportionate difference in the local prices will be greater than that for the unprocessed product. Consequently, if trade restrictions between the two countries are removed, the producer prices of the products in Dahomey will be increased to the benefit of the farmers and the retail prices of the products in Nigeria will decrease to the benefit of the consumers. Both countries will, therefore, gain. Moreover, the farmers in Dahomey will have greater incentive to expand production. The prices in Nigeria and Niger are about the same, except for cassava. Niger has similar additional transportation costs for her imports from the international market as for her imports from Dahomey. The respective benefits which will be derived by Dahomey and Niger from the free movement of products from Dahomey to Niger will, therefore, be greater than in the case of Dahomey-Nigeria.

186. The export parity prices of maize and sorghum are a bit, but significantly, lower than the local prices of these products in Dahomey. Dahomey can, therefore, export these products to the international markets only at a loss. On the other hand, it competes very favourably in the markets of Nigeria and Niger for these products. The countries, therefore, gain by not paying the cost of freight from international markets. This is particularly important since most of the benefits of freight go to other countries - the developed countries.

187. It should be noted, however, that the removal of trade restrictions will tend to equalize the retail prices of the products (less transportation cost). While retail prices in Nigeria and Niger will fall, those in Dahomey will rise and this may affect consumers in Dahomey adversely. Because of this, mere removal of trade barriers will not be enough. It should be accompanied by an effective policy for increasing production and productivity so that the increase in prices in the exporting country will be kept to the minimum. The farmers should benefit through

Table X: Local and import prices of some food products in Dahomey, Niger and Nigeria (1972/73)

		(per ton)			
		Maize	Rice	Sorghum	Cassava(fresh)
Price in Dahomey					
CFAP		10,000/15,000	16,000	12,000	3,000/4,000
\$US		42/62	67	50	12.5/17
Price in Niger					
CFAP		31,000/25,000	65,000/30,000	30,000/25,000	25,000/15,000
\$US		129/104	271/125	125/104	104/62
Price in Nigeria					
₦		74/67	134/157	78	20
\$US		111/101	202/235	118	30
Import price ₦					
		68	117	71	-
\$US		102	265	107	-

Source: Institute of Agricultural Research, Samaru, Zaira and Ministry of Agriculture and Natural Resources, Western State of Nigeria; Government sources for Dahomey; Direction de l'Agriculture for Niger.

Notes: Import price is the international market price plus freight to Lagos (and also to Cotonou). Where two figures occur for Dahomey and Nigeria, the first is for the southern part of the country and the second for the northern part; for Niger, the first is average high price and the second average low price.

increases in productivity rather than simply through increases in prices. This further underscores the need to combine policies for the promotion of intercountry trade with policies for the expansion of production.

(b) Co-operation for crop and livestock development

188. As indicated in Section V, agricultural development should be based on the development of family farms rather than merely increasing crop production. The basic objective should be to develop and improve the capacity of the mass of small farmers to increase agricultural production and their farm income, that is, to make them more productive farmers. A policy based on the farm will more readily ensure the utilization of appropriate farm inputs, proper and efficient organization of the farm and the adoption of improved cultural practices. The small farmers will readily acquire the technological knowledge that will enable them to expand their farms and become bigger farmers. Also the most appropriate crops or combination of crops in each area will be promoted thereby ensuring a more efficient allocation and utilization of resources and greater increases in personal and national incomes.

189. This approach to agricultural development will be facilitated through a minimum price policy for all the major crops grown. Under such a policy, the output offered by the farmers will be purchased at the minimum prices. If the minimum prices are announced before the planting season, the farmers will take them into account in planning their production and, since the expansion of production of all the most suitable crops will be promoted, adjustments in the production pattern will readily be made with a view to maximizing income. The minimum price policy should be combined with the holding of stocks or reserves. It will also be more effective if it is combined with a price stabilization scheme whereby the stocks are released in areas where, and at the times when,

there is a shortage. By evening out the prices, consumers will benefit from the scheme and farmers may gradually rely more and more on the market for the purchase of food products and will therefore have the incentive to specialize.

190. Inadequate storage facilities are among the factors contributing to the inadequate food supply, especially in the humid tropics. Provision of suitable storage facilities is, therefore, necessary for the expansion of food production. Even in the drier regions where sorghum and millet are appropriately stored by the farmers, centralized storage will facilitate the distribution of the products to areas where there is a shortage and also to industries, considering that marketing channels are not well developed. It will also make the farmers rely more on the market and to specialize. The cost of the collection and distribution of the products will, however, be very high if the scheme covers a whole country. It may, therefore, be better to limit the schemes to the major producing areas and to the areas under special agricultural development programmes in order to minimize the cost of collection. The area covered will be expanded as the special programmes for increasing productivity are broadened.

191. The scheme can be undertaken on national basis. Its benefits will, however, be greater if it is undertaken on group-country basis. Storage facilities are costly and will be a great burden for small countries, especially if facilities are to be provided for all major crops. On the group-country basis, on the other hand, the cost will be shared so that the cost to each country will be less burdensome. Also, the quantity of each product to be stored will be less for each country than if the storage facilities were to be provided on country basis.

192. Of even greater importance is the opportunity to exploit the complementarities that exist between areas and between countries with a view to ensuring a steady supply of the products for all the countries concerned. Thus, where there are differences in the planting and harvesting seasons, the purchases made in one area could be used to supply other areas in pre-harvest periods. Similarly, where there are localized crop failures, the areas affected could be supplied with purchases from other areas; and where there are differences in soil characteristics and in altitude, the crops produced in favourable areas can be supplied to other areas.

193. A group-country minimum price-cum-price stabilization scheme will also facilitate intercountry commodity movements. A country that does not produce a sufficient quantity of a particular product for its needs will easily make use of supplies from the stocks in surplus producing countries. The existence of stocks will greatly facilitate the procurement of products by deficit countries. The scheme will thus promote an automatic intercountry trade with the grouping as a unit and the co-operating countries as merely regions within the unit. With such an assurance of the supply of all important products, each country can then concentrate on promoting the production of crops for which it is most suited and relying on the other countries for the supply of products which it cannot produce at all or which it can produce only at a relatively higher cost. Thus, an opportunity will be provided to put the principle of comparative advantage into action but with the difference that, since the supply of the commodities is not allocated to countries, each country will be free to make alterations in its production patterns as technological knowledge increases or factor proportions

change so that a surplus country for one product today may become a deficit country for that product and a surplus country for other products tomorrow. This will ensure efficient and effective utilization of production resources and, consequently, maximization of income both on national and on the group-country levels. This underlines the importance of including all the important crops in the scheme.

194. The price policy will be determined and implemented by the grouping. In order to exploit fully the benefits of comparative advantage, the minimum price should be uniform for each crop throughout the grouping so that the deficit country pays only for the cost of transportation in importing a particular product from a surplus country. This may, however, not be for immediate application but should, rather, be an objective to aim at. The price data in Table X show that Nigeria and Niger are high cost producers while Dahomey is a low cost producer of rice, maize, sorghum and cassava. If the minimum prices of these products are made uniform, the prices of the products will rise very much in Dahomey and this may affect the economy adversely. It may, therefore, be preferable to have different levels of minimum prices in the initial stages. The prices could then be unified as the measures for increasing productivity and for the reallocation of resources to more profitable production become effective. The period within which the prices will be unified and the commodities that will actually be covered by this policy will be determined by the co-operating countries through negotiation.

195. There may also be other cases where a uniform minimum price may not be appropriate as, for example, where a special measure is necessary to help a relatively backward country or region. In such cases, there should be different levels of minimum prices, but the objective should be to limit the difference to the level of the transportation costs from other producing areas; otherwise, the producers in such areas may sell their produce in a country or region with a higher minimum price, thereby causing shortages in their own areas which may necessitate the re-importation of products at unnecessarily high cost with a great loss of benefits to the grouping.

196. It will be most appropriate to relate the minimum price to export/import parity prices. The minimum price should not be less than the export parity prices; rather than that, the surplus should be exported to other countries for the benefit of the farmers and the grouping as a whole. On the other hand, the objective should be to bring all minimum prices to less than the import parity price since this ensures maximization of benefits for the grouping. However, this may not be achieved until farm production technology has improved considerably. In the interim and in cases where the grouping considers it necessary to promote the production of a particular crop specially, the minimum price could be higher than the import parity price. Since international prices change considerably, it may be advisable to take three-year averages of the export/import parity prices. The maximum price does not, however, need to be fixed on a long-term basis. Variations will be necessary in order to avoid too much stocking and consequent high expenditure on storage and also to avoid shortages in production and consequent imports at high prices. The changes in the level of the minimum price could be annual; what is essential is that the price should be announced well before the planting season.

197. This scheme will apply to field crops produced largely for consumption and for industries within the grouping. It will, however, not apply to the crops whose production is localized and which are often meant for localized industries,

e.g., sugar-cane and kenaf produced for particular factories. It will also not apply to highly perishable products like vegetables and fruits, the production of which needs to be geared to the marketing. It is most suitable for food grains (cereals and pulses). With regard to roots and tubers, particularly cassava and yams which are better stored in processed form, the purchases at minimum prices need to be geared to processing. Processing does not need to be undertaken by the grouping or even by the individual Governments or Government agencies. What is necessary is the promotion of processing and the organization of supplies for the processing factories. The processing could, however, be undertaken on behalf of the grouping on a contractual basis, that is, the price stabilization agency for the grouping could arrange for the processing of the products by private investors and it can collect and store the processed products which should then be treated in the same way as food grains.

198. The co-operation measure for food products and products of local industries will thus not entail the harmonization of production, which is very difficult to achieve in view of insufficient knowledge of ecological characteristics, the need increasingly to apply improved techniques and the desire to assure a regular and reliable supply of vital products and the consequent self-sufficiency policy being pursued by many countries. Instead, co-operation will be aimed at a common minimum price-cum-price stabilization policy which includes the holding of stocks of the main food products, especially cereals, pulses, cassava and yams. This leaves each country free to pursue its production policy within the framework of the minimum price policy and to alter its production pattern and specialize. The price policy also provides an incentive and introduces an element of competition for increasing production. The scheme ensures a reliable supply of the main products, promotes diversification of production and steady farm income and maintains an appropriate balance between supply, demand and stocks. Also, it minimizes the fear of depending on other countries for food supply and the need for self-sufficiency.

199. The scheme necessitates the extension of co-operation to the export policy for food crops and also for traditional export crops. For the latter, while a uniform buying price policy is not essential, there will be need to harmonize price policies. This is necessary in order to avoid clandestine movement of products across the borders but it is particularly necessary also for facilitating the co-operation policy for food crops. The annual traditional export crops are generally intercropped and rotated with food crops. Consequently, their prices and those of the food crops are interrelated. Even the tree crops compete with the field crops in labour input and resource use. All the buying prices, therefore, need to be co-ordinated.

200. The buying prices for annual export crops like food crops, need to be related to the export parity prices. With regard to the tree crops, there is need for price stabilization in view of the long-term nature of production, the wide variations in the international prices and the low price-elasticity of demand for such products and the possible disruptive effects such wide variations in prices could have on food production and on farm income. For example, now that the prices of most of these products are high, if the farmers are paid the equivalent of the export parity price, they may divert their production resources to the expansion of the production of these crops. If prices fall within the next

five or even ten years relative to the prices of food products, such investment will be a great loss. Meanwhile, with the diversion of resources to these crops, food production will have decreased and the food import bill increased. The economy loses and so do the farmers themselves.

201. If the internal markets are pooled, the external markets need also to be pooled. This will facilitate the export of surplus food products purchased under the minimum price policy and it will also facilitate linking the price policy for export crops to that of food crops. In addition, the disruptive effect which competitive export promotion and an independent export price policy will likely have on the common price policy and on the pooled internal markets will be avoided. There will be economy in the use of export trade and export promotion facilities and the demands of international markets for various grades and qualities of products will be more readily met. Moreover, the grouping will have a strong bargaining power in the international markets for obtaining good prices for its exports.

202. The transportation of the export products needs also to be co-ordinated once the export markets are pooled. This will facilitate supplying the various international markets and also ensure efficient evacuation of products. Product evacuation presents a great problem to the land-locked countries. Co-operation in this respect will minimize this problem and, at the same time, assure the coastal countries of steady traffic which will enable them effectively to plan the expansion of port and other transportation facilities. Indeed, the establishment of transportation system and facilities is an area for economic co-operation in which mutual benefits will be derived by all the partners.

203. Livestock and livestock products need to be included in this scheme of co-ordinated price and external trade policies. At present, it is difficult, if not impossible, to control the movement of nomads across borders. Facilitating their movement is a strong economic factor for co-operation. Moreover, livestock and livestock products are the major products which the Sudano-Sahelian countries can provide for the markets of the countries of the humid tropics. Livestock and livestock products, therefore, complement food crops in a co-operation scheme for pooled internal and export markets.

204. There has been much discussion as to whether abattoirs should be sited in the producing or in the consuming country. The producing countries place emphasis on the by-products which are raw materials for industries and which provide the basis for industrial development. On the other hand, in view of the low level of income for the purchase of air-freighted chilled or frozen meat and also the preference of a high proportion of consumers for warm meat, there is an equally strong argument for siting abattoirs in the consuming countries. This question should be considered on the basis of costs and benefits and also on the basis of what is practicable. It was not possible under the pilot project to collect the data for a full comparative cost-benefit analysis on this question. Consequently, only a preliminary analysis is made here.

205. Various estimates of loss of weight by animals transported on the hoof have been made. In some cases, the loss has been estimated at 20 per cent. It is known, however, that a greater part of this loss of weight is very readily regained. Consequently, the additional cost involved in re-fattening the cattle

trekked is generally not more than \$US 12 per head<sup>6/</sup> whereas the cost of conveying the animals by road transport over the same distance is about \$US 18 per head. Trekking the animals thus helps to bring down the cost of meat and, at the present stage of economic development, this is very important for the region where the per capita income is generally low. On the other hand, the cost of air-freighting chilled meat is about \$US 0.7/kg or \$US 70 per carcass. This is much higher than the cost of transporting live animals by road or by rail and makes the cost of chilled meat too high for the low income group and even for most of the middle income group. It can thus be said that siting abattoirs in consuming areas helps to keep the cost of meat low and, therefore, has greater economic benefits than siting abattoirs in the livestock producing countries. Besides this, the nomads know no boundaries and their movements cannot easily be controlled. It will, therefore, not be realistic to make it a policy that abattoirs should be sited only in the livestock producing countries.

206. It should, however, be noted that most of the by-products of abattoirs are generally processed in large-scale establishments. These by-products will, therefore, be better utilized if their output in a locality is high. This necessitates siting abattoirs in the same locality. On the other hand, in order fully to exploit the lower cost of transporting live animals than meat, there will be a tendency to establish abattoirs simply to satisfy local demand for meat which, in most cases, is small and needs fairly small-scale abattoirs. The cost of collecting the by-products at a central place for processing will, therefore, be high. Consequently, siting abattoirs in a central place, preferably in the producing country and distributing the meat from there to the consuming centres will have the advantage of better utilization of by-products. However, before a conclusion can be drawn on economic grounds, it will be necessary to undertake a full cost-benefit analysis, including an analysis of the effect on the price of meat to the consumer.

207. At the present state of economic development, it may not be necessary to have a firm policy on this issue. What is important is the removal of trade barriers, particularly customs duty on meat and meat products, so that the abattoirs sited in both the producing and the consuming countries can compete freely for the markets in the grouping. With a pooled internal market for the grouping and a co-ordinated external market policy, the abattoirs in the livestock-producing countries will compete very favourably in distant markets with the abattoirs in the nearby consuming countries in view of the extra cost of transporting live animals from the producing to the consuming countries. The co-operation arrangement will, therefore, make it possible for the livestock-producing countries to expand their meat and by-products industries. They can also compete in some of the markets of the consuming countries of the grouping and may sell meat in these markets at competitive prices and make up with the profits from sales in distant markets and from the by-products.

#### (c) Co-operation for agro-industrial development

208. Industrial development is very important for general economic development. Some Governments place a higher priority on industrialization than on the development of any other sector. In the early stage of industrialization, the processing

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<sup>6/</sup> This is on the assumption of 15 days for re-fattening at about \$US 0.75 per animal per day.

of agricultural products often predominates and gives the spur for industrial development. Consequently, schemes for economic co-operation need to take into account this important role of processing industries in the promotion of industrialization and of general economic development. Moreover, the processing of agricultural products is very important for the development of agriculture considering that industries provide market outlets for many crops and that some crops are better stored and transported in processed form.

209. It is proposed under this pilot project that co-operation for agro-industrial development should be based on two principles, namely, that each country in a grouping should have a good opportunity to industrialize and that agricultural raw materials should, as far as possible, be processed in the producing countries. At present, most of the agricultural raw materials including groundnuts, cotton, palm oil, cocoa, rubber and hides and skins are exported in raw form to developed countries and the products manufactured from them re-imported. This is an eloquent example of economic dependence. The countries are now making great efforts to change this situation. It will be very necessary to ensure that the smaller countries do not transfer this economic dependence from the developed countries to the bigger or more richly endowed countries in an economic grouping. Partnership works better on the basis of equality than on the basis of dependence.

210. As already indicated in section V, the development of agro-industries should be promoted through small-scale or labour-intensive enterprises. Such enterprises have greater social benefits than large-scale capital-intensive enterprises. In particular, they increase personal and national income more, they help to solve the unemployment problem, they are more efficient considering the limited size of the markets and they promote locally-based industrialization and, therefore, self-reliance and economic independence.

211. Co-operation should, therefore, consist in harmonizing the industrial development policies on this basis. This should largely entail establishing a common protective tariff for small-scale and labour-intensive enterprises/establishments against imported competing products and also against local large-scale capital-intensive establishments. The demarcation between the establishments should be determined by the "social cost-benefit" ratio in which only off-shore costs are regarded as social costs and the rest of the value of production as social benefits. The cut-off level could be reviewed as industrialization progresses. Thus, only the products of small-scale or labour-intensive enterprises which have a low "social cost-benefit" ratio will enjoy the benefits of the pooled markets within the grouping. There should also be a common export policy for the products so as to facilitate their competing effectively in external markets with the products of capital-intensive establishments. Within this framework of common policies, each co-operating State will be free to pursue its industrialization in free competition with the other members of the grouping.

212. By thus excluding large-scale capital-intensive industrial establishments from enjoying the benefits of the protected markets in the grouping, most of the foreign industrial concerns will be excluded from the grouping. This will minimize the dominance of the bigger or industrially more favoured countries in the grouping and also ensure that the benefits from co-operation accrue mainly to nationals. It will, at the same time, promote industrial development in the smaller countries and thereby provide an opportunity for all the co-operating countries to benefit on similar basis from the grouping.

213. This scheme appears to be contrary to what is generally considered to be the main objective of economic co-operation, namely, to pool the small markets into a big market for the products of large-scale industries. While this objective is important for some industries which are inevitably large-scale, in general, the grouping and the individual countries do not gain much under such co-operation schemes. Most of the gains go to the foreign investors and the developed countries that supply the capital equipment and economic dependence is enhanced. The scheme proposed here establishes a framework for the promotion of indigenous industrialization. The individual small-scale or labour-intensive enterprise may be able to serve only the local markets or the markets just across the borders, but the protection given to such establishments will promote their expansion and growth. An opportunity will be provided fully to exploit the manpower and natural resource endowment of the individual countries, and the free movement of the commodities across the borders will introduce competition and promote efficiency. The establishments and the economy will grow together, each feeding on the other, in place of a superimposed system that creates a dual economy and, in reality, does not help much to promote economic development.

214. As in the case of crops, the scheme also promotes specialization since an assurance of a market within the grouping promotes innovation and lessens risks. There are some products for which the demand is too small and which may not be produced on individual country basis in view of the limited national market. Such products may be end-products or intermediate products for other industries. Opportunity will be provided for some countries in the grouping to specialize in the production of such products for the grouping as a whole. An opportunity will also be provided for each country to expand the industries for which it has greatest advantage either because of the natural resource endowment or because of the special aptitude of the labour force.

215. Knowledge of industrial processes, commercial practices and business management is very necessary for industrial development. This knowledge is greatly limited in the countries studied. While Nigeria has made some progress in this respect, local businesses have not expanded much. Indeed, many of the nationally-owned businesses are managed by foreigners. The expansion of locally based small-scale and labour-intensive enterprises will be greatly facilitated if advisory services are provided for the local businessmen on various aspects of industrial organization and management, including the process to be utilized, the source of supply of input and equipment, the organization and management of the enterprises, etc. In one of the countries studied, such a service exists but it is much limited in scope. The service needs to be sufficiently intensive and of a high quality to be effective. Such services could be provided with the assistance of international organizations.

216. In addition to the general scheme, special measures should be undertaken for the industries that are inevitably large-scale. If the utilization of labour-intensive processes is promoted in all possible cases, there will not be many large-scale capital-intensive industries. The special measures for these industries, especially with regard to their location, will, therefore, be facilitated, especially as the general scheme will have provided each country with the opportunity to industrialize, thereby minimizing national interests in the large-scale industries.

217. The current thinking is that such industries should be allocated to the co-operating countries in such a way that each country "can have a cake". In practice, however, it has not been easy to reach agreement on the allocation of such industries. It may be preferable to establish a holding company for such industries on the level of the grouping. This holding company will exercise general control over the industries in a similar manner as for common services. The industries may be required to pay a profit tax which will be put into the common purse so that all the members in the grouping can benefit from the industries. In this way, the problem of dependence on the countries in which such industries are sited for the supply of the products of such industries will be minimized since all the members of the grouping will have interest in the holding company as equal partners.

(d) Co-operation for research and training

218. The fourth important and complementary area for co-operation is research and training. There are three fields of research, namely, market research, food technology research and agronomic research. All these are interrelated. The objective of market research will be to exploit effective and "latent" demand through adapting products to consumer taste, through the development of new uses for the products and through changes in the prices of the products. Investigations need, therefore, to be made to ascertain consumer tastes and research conducted to adapt the products to ascertained tastes and to find new uses for the products. New external markets should also be developed. Pooling the resources at the level of the grouping for this purpose will facilitate the common price and market policy. It will also make the cost less burdensome on individual countries and ensure more efficient use of the resources.

219. Food technology research is an important aspect of market research both for adapting products to consumer tastes and for developing new uses for the products. It has a crucial role for the development of food processing industries, especially as the staple foods and the food crops in Africa are different from those in the developed countries where food technology research is advanced. Substitution of sorghum/millet flour for bread, use of cassava starch for bread and other bakery products, making flakes from yams, making yam flour that does not change colour with hot water, baby foods based on local food crops, etc., are all important contributions of food technology research to agricultural and industrial development. Co-ordination of activities in this respect within the co-operation schemes for crop and livestock production and for agro-industrial development will greatly facilitate the practical application of these innovations. It will also help to avoid duplication of effort and promote more efficient use of the limited research resources.

220. Agronomic research can also enhance market and food technology research through developing the crops that meet the tastes of the consumers and also the crops that can be processed more readily. Its central role, however, is in developing higher-yielding crop varieties that are well adapted to the ecological conditions. In this respect, much can be gained by co-ordinating research on sorghum/millet, maize, beans, yams and cassava as well as on oil palm among the countries studied. By such co-ordination, experiences will be shared. Also by co-ordinated planning and allocation of activities, duplication will be avoided and more efficient utilization of research facilities ensured.

221. As part of co-ordinated agronomic research, there should be a seed multiplication and distribution programme. Seed multiplication is costly, especially if it includes seed certification and seed banks, as it should. Economy will be effected if the programme is undertaken at the level of the grouping, especially for the crops that are grown in two or more of the countries and for seeds that do not involve high cost of transportation. For the countries studied, such a programme could include maize, rice and groundnuts in the first instance.

222. Inadequacy of trained manpower has been one of the major constraints to agricultural and agro-industrial development in the countries studied and in Africa as a whole. The proposed programmes for the development of family farms and of agro-industries and for market, food technology and agronomic research can succeed only if there are sufficient supervisory and intermediate staff and research workers. While efforts are being made in the countries studied to expand training facilities, greater progress can be made through co-operation. Besides the sharing of experiences on curricula, training facilities could also be shared and the burden of establishing and running training institutions by individual countries minimized.

### VIII. PRESENT AND FUTURE PRODUCTION AND TRADE

223. In section VI, an indication is given of the type of orientation in agricultural development strategy and in organization for agricultural development which would be necessary in the countries studied in order to achieve rapid increase in agricultural production which itself will further be facilitated by inter-country co-operation and trade expansion. In this section, the possible increase in production will be indicated as well as the possible surpluses and deficits in the production of individual food crops and the intercountry exchange of products that can result from this.

224. An obvious way of doing this is to project the supply and the demand for each product and thereby derive the surpluses and deficits and the proportions of these that will be exchanged among the three countries. The orthodox methodologies for supply and demand projections have not been adopted here for several reasons. Firstly, the model for supply projection that is based on capital-output ratio is of very questionable validity. Among other imperfections, it does not take adequately into account the need for changes in technology during the projection period and these changes are important factors for growth. In agriculture in the countries studied, increases in production are achieved much more through the development of institutions and through changes in technology (improved seed, improved farm practices) than through capital investment as such. These changes are not embodied in capital equipment as in developed countries.

225. Secondly, the current output of crops and numbers of livestock are generally rough estimates. Official figures in some cases are even conflicting. In such a circumstance, orthodox supply and demand projections will be unrealistic. The wide errors will only be magnified still further. Thirdly, agricultural production is largely by small farmers over whom the Governments have no control. A good projection should be based on their reactions and responses both to the incentives to be provided by the Government and to the general economic factors affecting agricultural production. These reactions and responses are generally not known, and the supply projection that overlooks them will be largely a guess.

226. A fourth reason is that there are many outlets for the products. Besides direct consumption by the local population, many of the food products can be processed to other products, used for animal feed or exported. The actual use of these products for these other purposes depends much on the quantities produced and on the price. Since it is not easy to determine the supply and the future prices, it will be difficult to determine these other uses for the food products. Indeed, these other uses should play an increasing role in the agricultural development of the countries studied. For example, if the production of maize can be increased substantially at sufficiently low cost, it can be exported or used locally for livestock feed or for making cornflakes or maize starch. Sorghum and millet can also be exported or used for feed or for the substitution of wheat in bakery products. Yams can be used for yam-flakes and its consumption can increase if it is processed into flour that retains the whitish colour on mixing with hot water. Cassava can be made into pellets and exported or used for feed locally or it can be processed into starch for industrial purposes or for use in bakery products. Thus, all the principal food products have important outlets other than direct consumption, and these outlets depend much on the supply and price. The supply and demand are, therefore, interdependent and this makes simple projection inappropriate.

227. It can, in fact, be said that there is no demand constraint for the food products in the foreseeable future. The emphasis should, therefore, be placed on increasing the supply. Rather than making projections for autonomous balance between supply and demand, a price policy should be adopted for ensuring an appropriate balance between supply, demand and stocks. As indicated in the preceding section, this is a better basis for promoting intercountry trade. The price policy should also be utilized, together with other policies, to encourage the consumption of locally produced food items over the consumption of imported products. The future path of such changes in consumption cannot readily be determined à priori. The analysis here is, therefore, limited to indications of possible increases in production and of the potential suppliers of the main products to group-country market or for export.

(i) Present production and intercountry trade in food products

228. Table XI shows the average of the estimated quantities of the main food crops and the traditional export crops produced in the three countries in 1964/65 and 1970/72. Maize, cassava and yams are the main food crops in Dahomey. Sorghum/millet, sweet potatoes and pulses are also important. The export products consist of palm oil and kernels, groundnuts and cotton. In Niger, there is even less variety, the main food crops being sorghum/millet which amounts to over 1 million tons in a year supplemented by cassava and pulses while the main export crop is groundnut. Rice and cotton are also grown under irrigation and production is increasing. In Nigeria, there is much greater variety of both food and export crops. All the cereals and root crops and tubers that are important in Dahomey are also important in Nigeria, and so are pulses. In addition, coco-yam and plantain are important food crops. In the same way, the export crops include those of Dahomey and Niger in addition to cocoa and rubber which are favoured by the higher rainfall that does not extend to nearby Dahomey because of the configuration of the coast-line relative to the rain-bearing winds and the upwelling cold water off the coast.

229. The food crops produced in the three countries are thus similar. Even coco-yams and plantains that are important food items in Nigeria are also produced and consumed in Dahomey. In Niger where they are not produced, they are not normally in the local diet. Similarly, yams which are an important food crop in both Nigeria and Dahomey are not an important food item in Niger. In view of these, it could be said that there is no complementarity and that intercountry trade in food products cannot expand much. This is, however, not the case.

230. Annex II indicates the recorded intercountry trade in food products between the three countries and with the rest of West Africa and the rest of Africa for 1964/66 and 1970/71 (averages). The magnitudes are small, except in very few cases, but they are indicative of future development. It is likely that the unrecorded trade is much greater. There are three patterns of intercountry trade, namely, importation of products by countries that cannot produce them, importation by countries that can produce the products only at higher costs and mere interborder movement of commodities.

231. Under the first group, Dahomey and Nigeria export vegetable oil (palm oil) to Niger. Even though Niger produces groundnut oil, its consumption of palm oil has been increasing since, it is said, the population has learnt that it contains carotene and, therefore, is more nutritive than groundnut oil. Niger cannot produce palm oil and will continue to depend on Nigeria, Dahomey and other coastal

**Table XI** Area, yield, output and supply of main food crops in  
Dahomey, Niger and Nigeria (1970-72 average)

	Area (1000 ha)	Yield (kg/ha)	Production	Output for consumption 1000 tons	Import export	+ - Total supply
<b>Dahomey</b>						
Rice	3	1,700	5	5	+5	10
Maize	360	550	203	192)	-	192
Millet	16	370	6	6)	-	51
Sorghum	80	570	47	45)	-	544
Cassava	108	6,350	680	544	-	544
Yams & sweet potatoes	62	10,000	560	340	-	340
Coco-yams	3	7,100	22	15	-	15
Beans	82	360	30	26	-	26
Wheat & flour	-	-	-	-	+18	18
<b>Niger</b>						
Rice	17	1,900	32	30	-	30
Maize	3	570	2	2	-	2
Millet	1,430	380	550	521)	-44	761
Sorghum	535	550	300	284)	-	104
Cassava	23	5,700	130	104	-	7
Sweet potatoes	1	5,800	7	7	-	59
Beans	975	76	74	64	-5	6
Wheat & flour	-	-	-	-	+6	6
<b>Nigeria</b>						
Rice	310	1,650	525	485	+2	487
Maize	1,420	850	1,220	1,150	+5	1,155
Millet	4,850	610	2,940	2,787)	+37	6,235
Sorghum	5,520	650	3,600	3,411)	-	7,424
Cassava	930	9,970	9,280	7,424	-	8,520
Yams & sweet potatoes	1,320	10,700	14,200	8,520	-	1,050
Coco-yams	270	6,000	1,500	1,050	-	758
Beans	4,050	215	870	748	+10	337
Wheat & flour	3	2,500	7	7	+330	337

**Source:** FAO Production Yearbook and FAO Trade Yearbook.

countries for the supply. In the second group, Dahomey exports maize, rice and cassava (and also yams) to Nigeria, even though Nigeria continues to import considerable quantity of rice from abroad. While Nigeria produces these crops, it has not fully achieved self-sufficiency and also produces them at higher costs than does Dahomey. For the same reason, Dahomey probably exports maize and rice (unrecorded) to Niger. Besides these, sorghum/millet (and also beans) are exported from Niger into Nigeria, and Nigeria exports much smaller quantity of sorghum/millet to Niger and some cassava and garri to Dahomey. This third type of movement is due not so much to the differences in the costs of production as to seasonal shortages and the nearness of the main producing areas in one country to the consuming areas in the neighbouring country.

232. Thus, while there is limited complementarity among the countries in the production of food crops, there is considerable difference in production costs between Dahomey, on the one hand, and Nigeria and Niger, on the other hand. This provides a very important motive factor for the promotion of trade. Seasonal shortages also give rise to the exchange of products, especially as the countries are contingent and transportation facilities are good. Moreover, with a common export policy, intercountry trade could further be expanded. For example, maize or cassava products could be exported overseas by Dahomey and any resulting deficit made up from imports across the border from Nigeria.

233. The trade matrices for 1964/66 and 1970/71 (averages) for livestock and livestock products are shown in Annex III. Here the movement is largely one way: cattle, sheep and goats and meat are exported from Niger into Dahomey and Nigeria. Cattle exported to Nigeria number tens of thousands. The export from Dahomey into Nigeria shown in the Table is probably re-exports of cattle from Niger, Mali or Upper Volta. The supply of livestock is a very important contribution which Niger in the Sahelian zone can make to a grouping that includes the coastal countries; it is also an important gain which it can derive from the grouping. This contribution will be enhanced if trade in meat is also liberalized among the countries.

234. Agro-based industries are not yet much developed in the three countries. Much progress is, however, being made in Nigeria where the list of the industries includes meat and dairy products, fruit canning, flour milling (wheat, maize, cassava and yam flour), vegetable oil seed processing (extraction of palm oil, palm kernel oil and groundnut oil), animal feed, cigarette making, spinning, weaving and finishing textiles especially cotton fabrics, leather finishing, leather goods including shoes, and rubber products including tyres and tubes. In Dahomey, the list is more limited and includes vegetable oil seed processing (extraction of palm oil and palm kernel oil), rice milling, cotton ginning, cloth finishing and pasta production. In Niger, the processing industry is at a rudimentary stage and is largely groundnut oil processing, leather finishing, flour milling (millet and sorghum) and dairy activities.

235. Trade in processed and manufactured products has not developed much among the countries. There is, however, considerable border trade between Nigeria and Dahomey in flour (maize, and cassava flour) and vegetable oil. Trade statistics also show that Nigeria exports wood products to Dahomey and Niger, textiles and drinks to Niger and manufactured tobacco to Dahomey. Nigeria, however, also exports soaps, rubber and leather products, and markets do exist in Dahomey and Niger for them.

(ii) Possibilities for expanding crop production

236. As indicated in Section VI, all the three countries have underutilized land resources. Under the existing farming system which requires long fallow periods, the resources in Niger and Dahomey are not very great; but under an improved system with use of manures and fertilizers and consequent shortening of the fallow period, the area under crops annually can readily be doubled and, in some cases, even tripled. Land is thus not scarce and does not present an important constraint to agricultural development in the three countries.

237. Niger, however, is not as favourably placed as Dahomey and Nigeria in this respect. While the area of the country with sufficient rainfall for crops is fairly large, it is a more or less marginal area and there is fairly frequent failure of the rains. The recent drought has disrupted much of the agriculture and it may take another year or two for production to approach normal. All the same, agronomic research can develop crop varieties that are more resistant to drought or that are quicker to mature. Moreover, the effects of rain failures can be minimized through the exploitation of underground water resources.

238. At present, agronomic research has not advanced much in the three countries. Regrettably, the research has been directed to sole cropping and mainly to "cash crops". The peasants find it difficult to integrate sole-cropping of the selected field crops into their farming pattern. Moreover, the advisory service has been too dispersed to be effective. For rapid development of agriculture in the three countries, research needs to be based on the farm with a view to finding how the existing cropping patterns can be improved in the way that the peasants can readily understand and adopt. At the same time, the advisory service needs to be sufficiently intensive effectively to assist the peasants to adopt improved cropping patterns and related farm practices. In combination with this, the necessary inputs should be made readily available and marketing improved to ensure the disposal of the increased output at a good price.

239. In other words, assistance needs to be given in a package comprising improved seeds, fertilizers and manures, appropriate farm equipment, intensive advisory services and a minimum price scheme for the improvement of marketing. This package requires considerable financial and manpower resources and cannot, therefore, be applied throughout the country at the same time. It needs to be concentrated in selected areas and extended to other areas as financial and manpower resources become available.

240. It has been indicated in section V that family farm agriculture has greater benefits for the economy than large-scale agriculture. Experience has shown that it is easier, not more difficult as is often thought, and less costly to organize family farms than to organize large-scale agriculture. The "groupement" system in Dahomey is now making good progress. More recently, another method of organizing small farmers was started in the East Central State of Nigeria by the State's Agricultural Development Authority.

241. Under this system, the Authority responds to the requests from various communities to develop their agricultural land. This request is often engineered by the Authority itself, but it always obtains the full consent of the community for its programme. The Authority clears and develops the land given by the community. Then, it redistributes the land to farming families. It ploughs and harrows the land for the families and levies charges for these services. It

supplies the seeds and the fertilizers for which it also charges the market price, and supervises the sowing and the application of fertilizers. It then purchases the products at harvest; but the farmers are free to sell their produce elsewhere provided they are able to repay all the charges. Besides the cost of the inputs and of the tractor service, the Authority levies a small annual charge for land development. The cost is spread over a long period to make the charge sufficiently small. The Authority thus operates on quasi-commercial basis.

242. Compared with large-scale agriculture, all the activities undertaken by the Authority are the normal activities of a large-scale enterprise. Consequently, the Government cannot expend more financial and manpower resources on such a programme than on large-scale direct production. For large-scale production, on the other hand, the agency responsible for it has to employ and supervise its farm workers. Although it will recoup its expenditure when it sells the produce at harvest, it will need larger operating capital than the Authority. Besides, and this is very important, many problems are often experienced in recruiting farm workers and in supervising them. In some cases, it may even be necessary to build houses for them. The problem of supervising a Government agency worker is a perennial one in Africa. Secure employment and the assurance of pay irrespective of output promote great inefficiency. Even if a piece-work system is adopted, much supervision is required to ensure that the work is well done. Moreover, the labour turnover is generally high. All these make such large-scale operations less efficient than family farm programmes.

243. Compared with other types of small-farm development programmes, the East Central State Agricultural Development Authority programme facilitates granting credit to small farmers by avoiding the need for collaterals and the long banking process of investigations for ascertaining the ability to repay loans. It also ensures that the farmers utilize the inputs supplied to them properly and that they adopt improved technology.

244. The Authority organises a tractor service, but it does not generally provide the service itself. Instead, it trains young people in tractor operation and gives them loans to purchase tractors. These young people work on the Authority projects with their tractors and receive the fees paid by the farmers for the service. From these receipts they repay the loans for the tractors. By not making the service a Government agency service, the Authority avoids the burden of supervision and, at the same time, ensures efficiency. It is reported that tractor-owners plough up to six acres per day whereas under the normal Government tractor service the tractor drivers plough only one or, at most, two acres per day. This high level of operation is reflected in relatively lower charges to the farmers for the operation and in timely ploughing and, therefore, higher crop yield.

245. It is recommended that this type of programme, with some adaptations according to circumstances, should be adopted for the development of family farms and for agricultural development in general. The Authority undertakes soil analysis and crop trials for about two years to determine what crops and cropping pattern are most suitable for the area being developed. This minimizes the risk for the farmers without undue delay. The best crops for the selected area are grown and only when the market for a particular crop is saturated will there be need to grow second best crops. Crop trials need to be continued even after the production programme has started in order to ensure adaptation to changes in technology and in weather conditions. The Authority also promotes the processing of products on

Table XII Present and potential crop yields  
in Dahomey and Nigeria

Crop		Present yield (kg/ha)	Potential yield (kg/ha)	Percentage increase
Rice (rainfed)	Nigeria	1,000	1,500	50
	Dahomey	700	1,200	70
Maize	Nigeria	1,000	1,900	90
	Dahomey (south)	600	2,200	270
Sorghum	Nigeria	700	1,400	100
	Dahomey (north)	600	1,200	100
Yams	Nigeria	10,500	17,000	60
	Dahomey	10,000	15,000	50
Cassava	Nigeria	10,000	15,000	50
	Dahomey	6,500	10,000	50
Cotton	Nigeria	550	800	45
	Dahomey (centre)	600	1,800	200
Groundnuts	Nigeria	600	1,000	70
	Dahomey	600	1,200	100
Oil palm fruits	Nigeria	1,400	6,300	350
Cocoa	Nigeria	400	900	125
Rubber	Nigeria	500	1,000	100

Source: Research Bulletins of the Institute of Agricultural Research, Samaru,  
Recommendations of the Federal Department of Agricultural Research, Ibadan,  
Direction de l'agriculture, Porto-Novo, et les sociétés de développement rural,  
Dahomey.

the spot wherever possible. Again, it does not generally undertake the processing but, rather, encourages and assists private investors to establish processing plants. By this, local businesses are promoted, industries are more widely dispersed and the problem of procuring raw materials for a factory obviated.

246. Such a programme can be undertaken only if there is improved farm technology to disseminate to the farmers. While much agronomic research is still necessary, there are already recommended improved varieties of most of the main crops as shown in Table XII. The possible increases range from 50 to 60 per cent for yams and cassava to 200 per cent and over for oil palm in Nigeria and maize and cotton in Dahomey. The yields of most crops can be increased by 50 to 100 per cent. Such increases will generally cover the cost of production and they provide a sufficient basis for programmes for improving farm technology.

247. Dahomey already has a small-farmer improvement programme which only needs some modifications, in particular, with regard to basing it on the farm rather than on the crop. Small farmer programmes can be undertaken on a State basis in Nigeria and on the basis of Departments in Niger. The objective should be to cover the main agricultural areas in each State or Department within a given period. The programmes could be combined with other special programmes, such as irrigation schemes and special area development schemes.

### (iii) Agro-industrial production

248. Future development of agro-industries is indicated by the pattern of crop and livestock production. It should be in six main directions. Firstly, there should be increased processing of the traditional export crops, particularly oil-seeds, for export. The amount of groundnuts processed in Niger is a very small proportion of total exports and there is much room for expansion. Even though Dahomey produces a relatively small quantity of groundnuts, the amount exported is sufficient for the establishment of a processing industry and Nigeria can further expand this industry. Secondly, food processing industry for export should be expanded. An important example in this respect is cassava for starch or pellets. Indeed, now that there is much demand for animal feed-stuff, the production of cassava should be expanded both to meet local demand and for export. In this respect, small-scale processes would be very suitable in order to avoid the high cost of transporting the raw products.

249. Thirdly, the processing of food products for local consumption should be expanded. With increased urbanization and increases in per capita income, the traditional methods of preparing foods need to be replaced by processing the food products in factories. The processing of sorghum and millet for couscous, the milling of cassava, maize and yams into flour, the making of mixtures from flours, including reinforcement with groundnut or soya-bean flour and baby foods are all areas for industrial development in all the three countries. The women who have been undertaking such operations in their homes can find opportunities for employment and increased income in the industries themselves and in farm operations under the special programmes for increasing production as well as in small-scale animal husbandry, including poultry keeping, preparation of ready-made foods like bakery and similar products, and trading.

250. Fourthly, the local raw products should be utilized in making some food products that are at present imported. For example, yams and maize should be used in making flakes and the production of margarine from vegetable oils should be expanded in Nigeria and started in Dahomey and Niger. With a common export policy, it will be possible to find overseas markets for the surpluses of these products. Similarly, direct substitution of local for imported raw products should be promoted more vigorously. An obvious example is the partial substitution of sorghum/millet flour and cassava starch for wheat flour in bread-making and in other bakery products. Indeed this offers a great opportunity for increasing the production of these products and the income of their producers. Also the flour of local cereals should be used in making pasta.

251. Fifthly, manufacturing industry based on local products should be expanded. Nigeria has shoe and soap factories. Similarly, the textile industry should be expanded in Dahomey and Nigeria. While Niger is not well situated for cotton production, it can establish a textile industry with cotton imported from Dahomey or Nigeria to supplement local production. The opportunities for expanding this industry in the three countries are great considering the large quantity of textile fabrics imported by the countries. The utilization of labour-intensive processes can facilitate expansion. Some factories could be established just for spinning or for making of bafts which will then be supplied to other factories. In Nigeria, some highly automated textile machines have been installed. The gain to the economy from such operations has been minimal. Only Nigeria produces rubber. Like in the case of soap and textiles, there are opportunities for expanding the production of rubber products, particularly the manufacture of tyres and tubes.

252. Sixthly, there are industries for import substitution per se, such as the sugar and tomato purée industries. These industries have been considered by the three countries. Nigeria already has one sugar factory and several more are being planned. Niger has a proposal for a 15,000 ton-capacity factory for irrigated sugar-cane production, while plans are already advanced in Dahomey for establishing a bigger factory. Sugar production has often been considered in terms of large-scale production, but there are simple small-scale processes for making unrefined sugar. Consideration should be given to establishing such small-scale production and developing the market for the output. Alternatively, the output could be sent to a central factory for refining. Under this group of import substitution industries, Nigeria has the potential for expanding its pulp and paper industry.

253. Agro-industrial development should not be based mainly on import substitution as hitherto. To allow local demand to expand sufficiently for a large-scale factory before establishing the factory has resulted, and will continue to result, in very slow agro-industrial development. The objective should rather be to utilize local raw materials for locally based industries and to transform the local raw materials into processed products and thereby increase their value and the national income, and also increase their use, demand and production. For this to be achieved, the industrial establishments need to be small-scale and labour-intensive as far as possible. This policy will promote demand by providing wider end-uses and increased personal income which, in turn, will promote the expansion of the industries. Demand and production will thus feed on each other to promote rapid economic development.

254. All the countries studied have the opportunity to expand industrial production. A common policy framework for co-operation as proposed in section VII will facilitate such expansion by ensuring both the internal and external markets for the products of each country. Co-operation will thus promote mutual assistance for the mutual development of the economies.

(iv) Future production and intercountry trade

255. The data on the production of food crops in the countries studied are very unreliable. There are wide differences in the data from national sources compared with FAO data and with the data from the United States Department of Agriculture. The differences occur in total production, in the area under each crop and in crop yields. In order to minimize the effects of unreliable data, only the net increases in future production and consumption have been estimated and these are shown in table XIII. The figures are not precise and only provide broad indications as a general guide for production, price and utilization policies.

256. From the available data, food production has increased little in Niger and Nigeria over the last 10 to 15 years. In Niger, the best period was from 1963 to 1969 when the rate of increase was about 1.8 per cent per annum. In Nigeria, the best period was 1972 to 1974 when the average annual increase was about 1.4 per cent. Only in Dahomey has there been a considerable increase in production which was at the rate of about 3.5 per cent per annum between 1963 and 1974. This situation is reflected in the internal prices of food products: the prices in Dahomey are considerably lower than those in Niger and Nigeria (see table X). It is none the less possible to expand food production in each of the three countries. Since the high prices in Niger and Nigeria have not provided sufficient incentive to the farmers to increase production, it has been assumed here that the special small farmer development programme already described should be implemented in each of the countries.

257. The increase in production shown in table XIII are the increases that could be achieved from this special programme over the normal increases in production that have been achieved in the past years. These net increases in production have been calculated from the following equation:

$$P = \sum_{t=1}^n A Q_I \sqrt{a \log_e (bt)} - A t Q_p (1+r)^t$$

where P = net increase in production

A = area covered annually by the special programme

$Q_I$  = possible (achievable) yield from improved crop variety

$Q_p$  = present (average) crop yield

r = the annual rate of increase in yield under the present policies and programmes

t = time (in years)

a and b are constants.

258. The term,  $a \log_e (bt)$ , indicates the rate of adoption of new technology or improved farm practices. In other words, it indicates the rate at which the farmers can achieve the possible yield of the new crop variety. This rate will depend primarily on the intensity of the extension service and on the facilities for input supply and market improvement which all constitute the special small farm development programme. The rate should also vary according to the readiness of the various farming communities to accept new ideas; but the same rate has been adopted here for all the three countries.

259. The rate of expanding the programme will depend much on the availability of trained staff for the intensive extension service. It has been assumed that each of the States in Nigeria (except Lagos State and Rivers State) will be able to train, on average, 150 agricultural assistants as extension agents per annum in addition to supervisory staff. Since a Nigerian farm family cultivates an average of about 1.5 hectares, and on the assumption of one extension agent to 150 farm families, each of the States will be able to organize the programme over 35,000 hectares per annum, or 350,000 hectares for the whole country. Similarly, on the assumption that Dahomey can train 120 extension agents per annum and that each farm family cultivates 1.5 hectares, it will be able to cover 27,000 hectares per annum. For Niger, where a farm family cultivates an average of about 2 hectares, if 150 extension agents are trained per annum, it will be possible to cover 45,000 hectares annually.

260. In order to indicate the share of each crop in the total area covered, estimates of the total land area annually under field crops have been made. It is indicated in the annual report of the Direction de l'Agriculture, Niger, that the land area under crops was about 60 per cent of crop area, giving 2.7 million hectares under crops. For Nigeria, out of about 21 million hectares of field crop area, it has been assumed that 14 million hectares are actually under field crops, and in Dahomey about 900,000 hectares. The areas under the special programme thus account for 1.7 per cent of the land area under crop in Niger, 2.5 per cent in Nigeria and 3 per cent in Dahomey. These percentages have been applied uniformly for the individual crops in each country. If the countries are able to train more extension staff annually, the percentages will be higher and the net increases in production will also be higher than those indicated in table XIII.

261. The increases in production indicated in the table are net, that is, they are increases over and above the increases that can be achieved if the present policies and programmes are continued. Consequently, production under the present programme indicated by  $A t Q_p (1+r)^t$  is subtracted from the production under the special programme indicated by  $A Q_T \sqrt[a \log_e (bt)]{}^t$  for the areas covered by the special programme. If, therefore, the present production for the country is wrongly estimated, the effect on the net increase in production will be small. The value of  $r$  has been taken to be 1 per cent which may be rather too high for Niger and Nigeria. The special programme has been lagged, that is, it is expected to start in 1977 in order to allow for the planning and organizing the implementation of the programme.

262. In order to indicate the surpluses and deficits for intercountry trade, increases in consumption have also been estimated. This is based on the annual rates of population growth of 2.8 per cent in Dahomey, 2.9 per cent in Niger and 2.5 per cent in Nigeria. The estimated annual rates of increase in food production

**Table XIII: Projected increases in production and in consumption of  
Main food crops and production of groundnuts and cotton  
for 1980, 1985 and 1990**

				(In 1000 tons)		
Values of variables				1980	1985	1990
<b>Dahomey</b>						
Maize:	A = 10.8	Production		28	134	254
	Q <sub>I</sub> = 2,200	Consumption		+3	+5	+7
	Q <sub>p</sub> = 600	Surplus (+)/deficit (-)		+31	-139	+261
Sorghum:	A = 3.0	Production		1	12	26
	Q <sub>I</sub> = 1,200	Consumption		+1	+1	+2
	Q <sub>p</sub> = 600	Surplus (+)/deficit (-)		+2	+13	+28
Cassava:	A = 3.3	Production		1	70	169
	Q <sub>I</sub> = 10,000	Consumption		+9	+14	20
	Q <sub>p</sub> = 6,500	Surplus (+)/deficit (-)		+10	+84	+189
Yams:	A = 1.8	Production		-1	53	132
	Q <sub>I</sub> = 15,000	Consumption		+5	+9	+12
	Q <sub>p</sub> = 10,000	Surplus (+)/deficit (-)		+4	+62	+144
Beans:	A = 2.5	Production		1	6	13
	Q <sub>I</sub> = 700	Consumption		-	+1	+1
	Q <sub>p</sub> = 350	Surplus (+)/deficit (-)		+1	+7	+14
Groundnuts:	A = 3	Production		1	12	26
	Q <sub>I</sub> = 1,200					
	Q <sub>p</sub> = 600					
Cotton:	A = 1	Production		2	9	18
	Q <sub>I</sub> = 1,800					
	Q <sub>p</sub> = 600					
<b>Niger</b>						
Millet:	A = 24.3	Production		-4	6	42
	Q <sub>I</sub> = 500	Consumption		52	88	127
	Q <sub>p</sub> = 380	Surplus (+)/deficit (-)		-56	-82	-85

Table XIII (Cont'd)

(In 1000 tons)

Values of variables			1980	1985	1990
Sorghum:	A = 10.0	Production	3	30	66
	Q <sub>I</sub> = 1,000	Consumption	52	88	127
	Q <sub>p</sub> = 550	Surplus (+)/deficit (-)	-49	-58	-61
Cassava:	A = 0.5	Production	-	9	22
	Q <sub>I</sub> = 9,000	Consumption	14	24	35
	Q <sub>p</sub> = 6,000	Surplus (+)/deficit (-)	-14	-15	-13
Beans:	A = 17.0	Production	11	50	97
	Q <sub>I</sub> = 500	Consumption	8	14	20
	Q <sub>p</sub> = 110	Surplus (+)/deficit (-)	+3	+36	+77
Groundnuts:	A = 7.0	Production	5	30	62
	Q <sub>I</sub> = 1,000				
	Q <sub>p</sub> = 400				
<u>Nigeria</u>					
Rice:	A = 7.75	Production	-	23	56
	Q <sub>I</sub> = 1,500	Consumption	71	121	174
	Q <sub>p</sub> = 1,000	Surplus (+)/deficit (-)	-71	-98	-118
Maize:	A = 35.5	Production	27	215	469
	Q <sub>I</sub> = 1,900	Consumption	169	286	413
	Q <sub>p</sub> = 1,000	Surplus (+)/deficit (-)	-142	-71	+56
Millet	A = 121.3	Production	77	540	1,156
	Q <sub>I</sub> = 1,300	Consumption	457	772	1,114
	Q <sub>p</sub> = 650	Surplus (+)/deficit (-)	-380	-232	+42
Sorghum:	A = 138.0	Production	94	662	1,418
	Q <sub>I</sub> = 1,400	Consumption	457	772	1,114
	Q <sub>p</sub> = 700	Surplus (+)/deficit (-)	-363	-110	+304
Cassava:	A = 23.25	Production	-9	691	1,698
	Q <sub>I</sub> = 15,000	Consumption	1,088	1,837	2,652
	Q <sub>p</sub> = 10,000	Surplus (+)/deficit (-)	-1,079	-1,146	-954

Table XIII (Cont'd)

(In 1000 tons)

	Values of variables		1980	1985	1990
Yams:	A = 31.25	Production	67	1,279	2,972
	Q <sub>I</sub> = 17,000	Consumption	1,249	2,109	3,043
	Q <sub>P</sub> = 10,500	Surplus (+)/deficit (-)	-1,182	-830	-71
Beans:	A = 101.3	Production	49	260	536
	Q <sub>I</sub> = 600	Consumption	111	188	271
	Q <sub>P</sub> = 240	Surplus (+)/deficit (-)	-62	+72	+265
Groundnuts:	A = 46.4	Production	8	119	272
	Q <sub>I</sub> = 1,000				
	Q <sub>P</sub> = 600				
Cotton:	A = 16.75	Production	-1	24	61
	Q <sub>I</sub> = 800				
	Q <sub>P</sub> = 500				

Source: Present yield and output are based on FAO estimates in FAO.

Notes: Production is net of the quantity that can be produced under the present policies and programmes and has been worked out from the equation:

$$P = \sum_{t=1}^n A Q_I / a \log_e (bt) / - A t Q_P (1+r)^t. \quad A \text{ is the area covered}$$

annually by the special farm development programme, Q<sub>I</sub> is the possible yield from improved seed varieties and Q<sub>P</sub> is the average of the present yield largely from unimproved seed varieties. The consumption is net of production under the present policies and programmes but includes a rate of 0.5 per cent per annum in per capita consumption.

from the available data have thus been lower than the population growth rates by 1.1 per cent in Niger and by 1.2 per cent in Nigeria. In Dahomey, the rate of increase in food production exceeds the population growth rate by 0.7 per cent. On the assumption that per capita food consumption should be increasing at the rate of 0.5 per cent per annum, the difference between the rate of increase in food consumption and the rate of increase in food production is 1.6 per cent in Niger and 1.7 per cent in Nigeria; in Dahomey, the rate of increase in food production exceeds the rate of increase in food consumption by 0.2 per cent. These percentages are applied to the estimated food supply in the countries (table XI) to obtain the level of consumption over and above the level of food production under the present policies and programmes. The increase in consumption indicated in table XIII is thus net of the supply that can be made available under the present policies and programmes.

263. The rates of increase in consumption and the proportion of the area to be covered by the special programme have been applied uniformly for all the food products or crops. This is because the changes in consumption pattern should be geared to Government policy with regard to nutrition, the world prices for products and the profitability of the production of the crops. Similarly, variation in crop areas under the special programme should depend on the suitability of the ecological conditions and improved technology available for individual crops. All these factors are not easily determined a priori. They should be taken into account in the minimum price fixed for the individual product and in the relative prices of the products. The price policy, supported with the advice to be given by the extension agents, should, therefore, provide the main instrument for relating consumption to production. The data in the table provide only general indications.

264. It should be pointed out also that estimates of production of swamp rice in the three countries have not been included. Similarly, production from irrigation and water control programmes has not been included. Such programmes, however, do not generally include the production of roots and tubers, sorghum/millet, maize and pulses with which table XIII is primarily concerned.

265. The figures tabulated in the table lead to one very important conclusion and that is that the huge deficits in Nigeria and Niger indicate that, if the present food production policies and programmes are continued, these countries will probably have a food crisis by 1980-1985. If no increase in per capita food consumption is assumed, the deficits will be less, but they will remain sufficiently high to result in a crisis. In order to avoid this crisis, it will be essential to intensify food production programmes even more than has been proposed here under the special programme. A second conclusion is that Dahomey remains a net supplier of food products to both Nigeria and Niger. Its surpluses are, however, too small to satisfy the markets in Nigeria and Niger assuming that these markets are left open to its products.

266. Large amounts of resources should be directed to training staff and to organizing programmes that will effectively enable the small farmers to adopt improved farm technology. The usefulness of such a programme is indicated by the higher rate of increase in production with time. While the function, a  $\log_e(bt)$ , tends to level out with time, as additional increases in yield from existing seed varieties result only from greater efficiency in farm organization and farm practices, output can increase substantially when higher yielding seed varieties become available, that is, when  $Q_1$  changes. Such higher yielding seed varieties will very readily be adopted by farmers who are already participating in a special programme.

### Conclusion

267. In conclusion, it can be stated that under a co-operation scheme, each of the three countries has many products to offer to the pooled markets and to the markets outside the three countries. Dahomey has food products to offer, particularly maize, cassava and yams and also sorghum and their products. It can also supply soap and margarine from the oilseeds industry as well as cotton fabrics. Niger can supply livestock and meat and dairy products as well as leather products. It can also supply beans, animal feeding-stuff from its oilseed industry and possibly high quality soap. Nigeria, on the other hand, has special advantage in supplying rubber and wood products. It can also supply soap and margarine, cotton fabrics and leather products. There will also be some interborder movement of products. All the countries can thus gain substantially from any co-operation arrangement that includes facilitation of intercountry trade.

Annex I: Estimates of livestock (1000 head)

	1964/66 (Average)			1970/72 (Average)		
	Dahomey	Niger	Nigeria	Dahomey	Niger	Nigeria
Cattle	400	3,900	11,000	640	4,400	11,200
Sheep	460	2,100	7,500	610	2,700	8,100
Goats	540	5,500	22,000	630	6,000	23,500
Pigs	330	20	740	380	25	860
Poultry	4,000	5,500	47,000	2,700	690	82,000

1.  $\frac{1}{x^2} = x^{-2}$

2.  $\frac{1}{x^3} = x^{-3}$

3.  $\frac{1}{x^4} = x^{-4}$

4.  $\frac{1}{x^5} = x^{-5}$

5.  $\frac{1}{x^6} = x^{-6}$

6.  $\frac{1}{x^7} = x^{-7}$

7.  $\frac{1}{x^8} = x^{-8}$

8.  $\frac{1}{x^9} = x^{-9}$

9.  $\frac{1}{x^{10}} = x^{-10}$

10.  $\frac{1}{x^{11}} = x^{-11}$

11.  $\frac{1}{x^{12}} = x^{-12}$

12.  $\frac{1}{x^{13}} = x^{-13}$

13.  $\frac{1}{x^{14}} = x^{-14}$

14.  $\frac{1}{x^{15}} = x^{-15}$

15.  $\frac{1}{x^{16}} = x^{-16}$

16.  $\frac{1}{x^{17}} = x^{-17}$

17.  $\frac{1}{x^{18}} = x^{-18}$

18.  $\frac{1}{x^{19}} = x^{-19}$

19.  $\frac{1}{x^{20}} = x^{-20}$

20.  $\frac{1}{x^{21}} = x^{-21}$

21.  $\frac{1}{x^{22}} = x^{-22}$

22.  $\frac{1}{x^{23}} = x^{-23}$

23.  $\frac{1}{x^{24}} = x^{-24}$

24.  $\frac{1}{x^{25}} = x^{-25}$

25.  $\frac{1}{x^{26}} = x^{-26}$

26.  $\frac{1}{x^{27}} = x^{-27}$

27.  $\frac{1}{x^{28}} = x^{-28}$

28.  $\frac{1}{x^{29}} = x^{-29}$

29.  $\frac{1}{x^{30}} = x^{-30}$

30.  $\frac{1}{x^{31}} = x^{-31}$

31.  $\frac{1}{x^{32}} = x^{-32}$

32.  $\frac{1}{x^{33}} = x^{-33}$

33.  $\frac{1}{x^{34}} = x^{-34}$

34.  $\frac{1}{x^{35}} = x^{-35}$

35.  $\frac{1}{x^{36}} = x^{-36}$

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38.  $\frac{1}{x^{39}} = x^{-39}$

39.  $\frac{1}{x^{40}} = x^{-40}$

40.  $\frac{1}{x^{41}} = x^{-41}$

41.  $\frac{1}{x^{42}} = x^{-42}$

42.  $\frac{1}{x^{43}} = x^{-43}$

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44.  $\frac{1}{x^{45}} = x^{-45}$

45.  $\frac{1}{x^{46}} = x^{-46}$

46.  $\frac{1}{x^{47}} = x^{-47}$

47.  $\frac{1}{x^{48}} = x^{-48}$

48.  $\frac{1}{x^{49}} = x^{-49}$

49.  $\frac{1}{x^{50}} = x^{-50}$

50.  $\frac{1}{x^{51}} = x^{-51}$

51.  $\frac{1}{x^{52}} = x^{-52}$

52.  $\frac{1}{x^{53}} = x^{-53}$

53.  $\frac{1}{x^{54}} = x^{-54}$

54.  $\frac{1}{x^{55}} = x^{-55}$

55.  $\frac{1}{x^{56}} = x^{-56}$

56.  $\frac{1}{x^{57}} = x^{-57}$

57.  $\frac{1}{x^{58}} = x^{-58}$

58.  $\frac{1}{x^{59}} = x^{-59}$

59.  $\frac{1}{x^{60}} = x^{-60}$

60.  $\frac{1}{x^{61}} = x^{-61}$

61.  $\frac{1}{x^{62}} = x^{-62}$

62.  $\frac{1}{x^{63}} = x^{-63}$

63.  $\frac{1}{x^{64}} = x^{-64}$

64.  $\frac{1}{x^{65}} = x^{-65}$

65.  $\frac{1}{x^{66}} = x^{-66}$

66.  $\frac{1}{x^{67}} = x^{-67}$

67.  $\frac{1}{x^{68}} = x^{-68}$

68.  $\frac{1}{x^{69}} = x^{-69}$

69.  $\frac{1}{x^{70}} = x^{-70}$

70.  $\frac{1}{x^{71}} = x^{-71}$

71.  $\frac{1}{x^{72}} = x^{-72}$

72.  $\frac{1}{x^{73}} = x^{-73}$

73.  $\frac{1}{x^{74}} = x^{-74}$

74.  $\frac{1}{x^{75}} = x^{-75}$



Annex II: Trade matrix for food products among Dahomey, Niger and Nigeria. 1964-66 and 1970-71 (averages) (cont'd)

Importing countries	Exporting countries				Niger				West Africa				Rest of Africa				TOTAL
	Maize	Rice	Millet & sorghum	Cassava & flour	Veg. oil	Maize	Rice	Millet & sorghum	Cassava & flour	Veg. oil	Maize	Rice	Millet & sorghum	Cassava & flour	Veg. oil	Rest of Africa	
Rest of West Africa	Maize	1930															1,930
	Rice	5	15														5
	Millet & sorghum		5														15
	Cassava & flour																5
	Veg. oil																660
Rest of Africa	Maize																130
	Rice																85
	Millet & sorghum																8,200
	Cassava & flour																3,630
	Veg. oil																85
T O T A L	Maize	85															5
	Rice																
	Millet & sorghum																
	Cassava & flour																140
	Veg. oil																40
T O T A L	Maize	2615	20														54,415
	Rice	15	155														11,180
	Millet & sorghum																
	Cassava & flour																
	Veg. oil																

Note: The top figure is for 1964/66 and the bottom figure for 1970/71.

Annex III: Trade matrix for livestock and products among Dahomey, Niger and Nigeria 1964/66 and 1970/71 (averages)

Exporting countries	Dahomey			Niger			Nigeria			Rest of West Africa			Rest of Africa		
	Cattle	Beef	Sheep & goats	Cattle	Beef	Sheep & goats	Cattle	Beef	Sheep & goats	Cattle	Beef	Sheep & goats	Cattle	Beef	Sheep & goats
Importing countries	Products														
Dahomey	Cattle			1805											
	Beef			1040	15										
	Sheep & goats				...	155									
	Cattle					140									
Niger	Beef														
	Sheep & goats														
	Cattle														
	Beef														
Nigeria	Cattle	700		12800						35			14720		
	Beef	3595		26090						...			22515		
	Sheep & goats					1210									
	Cattle			3455		660									
Rest of West Africa	Beef			3725			...								
	Beef				270		1165	...							
	Sheep & goats				...			...							
	Cattle			20		390		70							
Rest of Africa	Beef														
	Sheep & goats														
	Cattle														
	Beef														
Rest of Africa	Sheep & goats														
	Cattle														
	Beef														
	Sheep & goats														

Note: The top figure is for 1964/66 and the bottom figure for 1970/71.

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# TRANSPORTATION LINKS BETWEEN DAHOMEY, NIGER AND NIGERIA

