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ECONOMIC COMMISSION FOR AFRICA

REPORT ON THE WORKING GROUP ON PRODUCTION
ACCOUNTS, COMMODITY BALANCES AND INPUT-OUTPUT
ANALYSIS AT BOTH CURRENT AND CONSTANT PRICES

Dakar, 4 to 12 October 1971

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PARTICIPATION IN MEETING AND ORGANIZATION OF WORK

Opening of meeting

1. The Working Group on Production Accounts, Commodity Balances and Input-Output Analysis at both Current and Constant Prices met in Dakar, Senegal, from 4 to 12 October 1971. The opening address was given by M. Ousmane Diene, Directeur de Cabinet du Ministère des Finances et des Affaires Economiques of Senegal and Mr. W.L. Booker, Chief of the Statistics Division, Economic Commission for Africa, replied.

Opening addresses

2. Mr. Diene welcomed country experts, observers and other participants of the Working Group and stressed the importance of the meeting in view of the need for good and reliable national accounts statistics for purposes of economic and social planning, now that the majority of the countries and governments of the region had chosen the path of planned economic growth and development. He pointed out that good and reliable national accounts statistics were needed not only for the formulation of realisable targets and workable schemes to ensure that an equilibrium between available resources and the uses of these resources were kept, balanced growth in all the sectors of the economy achieved, and the dual objective of high growth rates with price stability attained, but also for the periodic assessment of implementation of projects and schemes.

3. The present Working Group was the Twelfth meeting of its kind in the field of national accounts held in the African region under the joint sponsorship of ECA and the United Nations Statistical Office. The main purpose of the meeting was to examine and discuss the conceptual, classification and definitional aspects of the Class II accounts of the revised United Nations System of National Accounts (SNA), that is, the accounts relating to production, consumption expenditure and capital formation for transactions in goods and services, in the light of current African conditions and country practices, with a view to evolving standards and recommendations for application in countries of the region.

4. It was further pointed out that most countries of the region had had only limited experience in the compilation of production accounts, commodity balances and input-output tables. In fact the revised SNA was just beginning to be implemented in countries of the region. Production accounts in the form of accounts on commodities and accounts on industries, Accounts IIA and IIC of the SNA, had not yet been compiled in most African countries; commodity balances were available mostly in the form of food balance sheets for each country established by the FAO for selected years; and few African countries had compiled table 28 of the SNA, that is, the table on the supply and disposition

of goods and services adapted for use by developing countries. In the field of input-output analysis, it was pointed out that thus far only a dozen or so African countries had made such exercises for a particular year or more. This often represented a one-time exercise and was not always done by the countries themselves.

5. In encouraging the Working Group to carry on with the important task assigned to it, Mr. Diene emphasized the importance of improving basic statistics, without which the accounts and tables of the SNA could not be compiled. The SNA was especially suited as a framework for establishing national statistical systems and for formulating data collection programmes.

6. In reply, Mr. W.L. Booker thanked the government of Senegal, in particular, the Statistical Office of Senegal, for the invitation the latter extended to ECA to hold the meeting in Dakar, and for the excellent facilities provided therefor.

Participation

7. The following member States were represented: Cameroon, Democratic Republic of Congo, Dahomey, Egypt, Ethiopia, Ghana, Morocco, Nigeria, Senegal, Sierra Leone, Sudan, Togo and Uganda.

The associate member State of United Kingdom was also represented.

8. A Representative of the United Nations Statistical Office took the leading part in the Working group. There were observers from the FAO and O.E.C.D. The list of participants is given in Annex I.

Election of officers and organization of work

9. M. Serigne Lamine Diop, (Senegal) was elected Chairman of the Working Group and Mr. J.D.N. Nartey (Ghana) was elected Vice-Chairman.

10. All discussions were conducted in plenary sessions of the Group.

Agenda

11. The following agenda was adopted by the Working Group:

1. Opening address.
2. Election of Chairman and Vice-Chairman
3. Adoption of agenda.

4. The nature of the production, consumption expenditure and capital formation accounts and tables of SNA, including commodity balances and basic input-output data:
 - (a) Structure in current and constant prices;
 - (b) Concepts in current and constant prices;
 - (c) Classifications and definitions in current and constant prices.
5. The compilation of the accounts and tables in current and constant prices:
 - (a) The basic data required and methods of estimation in current prices;
 - (b) The basic data required and methods of estimation in constant prices;
 - (c) The problems and practices of African countries.
6. Input-output analysis:
 - (a) The objectives, concepts and methods of the analysis:
 - (i) In current prices
 - (ii) In constant prices
 - (b) The problems and practices of African countries.
7. Adoption of report.

ACCOUNT OF PROCEEDINGS

The nature of the production, consumption expenditure and capital formation accounts and tables of SNA, including commodity balances and basic input-output data.

12. This sub-item was discussed on the basis of paragraphs 2 to 19 of document E/CN.14/NAC/44 "Structure, concepts, definitions and classifications of the SNA accounts and tables on goods and services". It was pointed out that the accounts and tables in the production of goods and services in the SNA dealt with the gross output and cost structure of industries, the producers of government and private non-profit services and the domestic services of households and with the gross output and disposition of commodities and other goods and services. Industries generally produced commodities for sale in the market at prices which were intended to cover the cost of production, including a profit

(operating surplus) and had a capital formation account in addition to a production account. Producers of government and private non-profit services usually produce services and goods that they furnished to the community free of charge or at markedly reduced prices, excluding any profit (operating surplus); they financed this production themselves and therefore had consumption expenditure and capital formation accounts in addition to production accounts. Commodities were goods and services which were generally sold in the market at a price that was estimated to cover their costs of production. Commodities and other goods and services were disposed of to intermediate or final consumption, gross capital formation or exports. In the accounts on goods and services, the consumption activities of households were separated from their production activities and households per se had a consumption expenditure account only. All producers engaged in production in the domestic territory of a country were considered to be resident producers. In the case of households, residents included all persons living in the political boundaries of a country for one year or more, excepting the diplomatic and military personnel of foreign countries.

13. It was noted that foreign religious missions operating in the country, in the field of education, health, welfare, etc., were to be considered as resident non-profit producers. Ships registered under a nation's flag should be normally considered the domestic territory of the country of the flag of registration; ships engaged in coastal shipping in the territorial waters of a country, even though owned and operated by foreign interests (i.e. non-residents), should be considered as the domestic territory of the country if they continued the operation there for one year or more. Included in the non-residents of a country, amongst others, were foreign diplomatic missions, units of foreign armed forces stationed in the country and other units which had diplomatic privileges (e.g. the United Nations and its Specialized Agencies). Those foreign trade missions, to which diplomatic privileges were not accorded, would be considered residents. Similarly, if bilateral technical assistance missions (e.g. the USAID) were not accorded diplomatic privileges, they would be treated as resident producers as well. Extra-territorial bodies like the United Nations and its Specialized Agencies were non-residents of the country in which they were located or operating. However, the expatriate staff of these bodies would be residents of the country if they stayed or intended to stay in the country for one year or more.

14. In the case of an enterprise which operated aircraft, ships or railways entirely, or primarily, in the territories of several countries or in international commerce, and which were owned jointly by governments of these countries, the SNA recommended the raising of separate resident industries in the countries in question. In such cases, it might be feasible to estimate gross output based on the volume of traffic originating in the country in question. The cost of production of the resident industry should include a part of the overhead expenses of the parent enterprise, as well as the charges in respect of transportable fixed

assets, for example, aircraft, railway cars, lorries, etc., incurred in the enterprise's operations in the country. Fixed Capital formation should be allocated on the basis of location in the case of construction (i.e. structures), while capital formation in the form of rolling stock, as well as incomes from the enterprise, should be allocated on the basis of the share of the government of the country in question in the enterprises's equity.

15. The Working Group discussed borderline problems in respect of the classifications mentioned above such as (a) the distinction between producers of government and private non-profit services and industries, (b) the residence of these producers, (c) the distinction drawn between producers and consumers and (d) the dividing line between commodities and other goods and services.

16. It was pointed out that since it was essential to know the output of goods and services, the demand for raw material and for capital goods and the cost structure and resources of producers it was important to distinguish between producers of goods and services and the consumers of these items. For this reason households were divided between these two categories when they carried on unincorporated business. There was a difference in scope between the definition of households in the accounts of goods and services, on the one hand, and income and outlay and capital finance accounts, on the other hand. In the latter accounts, but not in the former, unincorporated enterprises were treated as part of households. While it was recognized that in the income and outlay and capital finance accounts there might be advantages to distinguishing between the unincorporated enterprises and the other activities of households, this was not practicable because households usually mixed up their incomes from business and other activities and the uses of this income, for example, in capital formation and consumption expenditure and outlays for the interest and repayments of debts which might have originated from enterprises activities and consumption. However it was agreed that these incomes and certain of the business uses of the income could be distinguished in the income and outlay and capital finance accounts. For example, the following categories could be shown separately: entrepreneurial incomes, rents, and interest paid on business debt.

17. In that connexion the Working Group considered the problems of gathering the required basic data for use in making national accounts estimates. The Group recognized that it was necessary to distinguish between the consumption activities, agricultural producing activities and the non-agricultural producing activities of households. It was considered that household income and expenditure surveys, as well as surveys of the gross output and cost-structure of agricultural and non-agricultural activities, would provide valuable data for these purposes.

18. At this juncture the attention of the Working Group was called to the fact that (a) the harvesting of all agricultural crops, whether for sale or for own consumption, was considered to be the production of

commodities and (b) the occupancy of dwellings, whether owner-occupied, furnished free of charge by Government or private non-profit bodies, or rented out was included in the boundaries of production. For example, subsistence farming and owner-occupied dwellings were treated as industries. The methods of estimating rents in the case of (a) owner-occupied dwellings in rural areas and (b) government buildings were discussed. It was explained that rents in respect of owner-occupied dwellings should ideally be equated to the actual rentals for the same kind of housing rented out in the area. However where no rented-out dwellings of the kind in question existed, the costs of maintaining, repairing and operating these dwellings should be used. This would include inter alia painting, plumbing, repair material, insurance costs, maintenance supplies, fuels, interest charges on mortgages and the equity of the owner. In the case of government-owned buildings that were used by government, rent should be estimated in terms of the actual costs of operation, maintenance and repairs and the allowances for depreciation only; an element of operating surplus for example interests should not be included. Rent in respect of dwellings owned by government and issued to employees should be computed in the same manner as that in respect of other dwellings.

19. The Working Group noted that certain units of government which furnished services to, or produced goods for, the government only or which provided services and goods to the public at prices which did not cover their costs of production, should be classified as industries. These were units which engaged in such activities as manufacturing or transportation and which made the same demands on resources and used essentially the same technologies as private business, for example printing establishments, shipyards, railroads, airlines. However, government units which furnished recreational, medical and similar services to the public should be classed as industries only if the prices they charged to the public fully covered their costs of production. Private units which furnished services, were incorporated as non-profit bodies but charged prices that covered their costs of production, should be treated as industries.

20. The Group recognized that the producers of government and private non-profit services might produce commodities. This was so if they sold some of their services to the public at a price that covered the cost of producing these services. The basic distinction between commodities and other goods and services hinged on whether or not the items were sold in the market at a price that was intended to cover the costs of production.

The structure of the accounts

21. Paragraphs 20 to 41 of document E/CN.14/NAC/44 were introduced. Two types of production accounts were presented, namely accounts showing the supply and use of commodities originating from domestic production and from imports, and accounts showing the inputs and outputs of industries and other producers. Attention was called to the accounts relating to the production of goods and services for the nation as a whole, which appeared in annex 8.2 of chapter 8 of the SNA and which represented a consolidation of all the accounts in current prices presented in the document under consideration. It was pointed out that the detailed input-output tables included in the SNA proper were too complex for the use of most developing countries but that the simplified tables on the supply and use of commodities appearing in the adaptation of the SNA to the developing countries would be suitable.

22. The discussion which followed concerned (a) the inclusion of import duties in value added, (b) the estimates of purchases of non-residents in the domestic market and (c) the criteria for distinguishing between consumer durables and capital goods.

23. In respect of (a) above, it was pointed out that import duties which were actually paid should be included in value added. These import duties needed to be added to the contribution to value added of the various producers since they were included in both intermediate consumption expenditure and gross output and therefore were subtracted out in compiling the producers' value added.

24. It was agreed that outlays of non-residents (including foreign diplomats) in a country could be estimated on the basis of various approaches. It was necessary to know the number of visitors, their family composition, length of stay and their average outlay by class of family. In the case of the number, composition and characteristics of non-residents, possible sources of data were completed forms required by immigration authorities on arrival and departure from persons, hotels, tourist agencies and the like. Data on the average outlays of visitors to a country classified according to family composition and length of stay might be gathered through sample surveys of departing persons, of persons in hotels, guest-houses etc. and of persons on tours. Surveys of this nature had already been carried out in some African countries. Foreign-exchange data would also yield the desired information when there were strict foreign exchange control.

24. It was suggested that the SNA should provide international guidelines in terms of values for purposes of classifying certain types of commodities into consumer expenditure and fixed capital formation. For example, a minimum value might be set as a criterion in the case of tools, spare parts and the like. It was however pointed out that it would be inappropriate to set a minimum value for the durable goods which producers purchase that should be classified as fixed capital

formation because there were marked differences between industries and establishments in the value of these goods that are employed as machinery, tools, equipment and spare parts. For example, in the case of small-scale handicraft which is very important in countries of the region, the equipment and tools were inexpensive new or imported second-hand items. A limit, say equivalent to US\$100, would automatically exclude many such items; and they would then be included in intermediate consumption. This could result in a false picture of the cost-structure of those establishments as compared to that of large establishments.

26. The question of distinguishing certain durable items, for example motor vehicle parts, which enter into fixed capital formation or into consumption expenditure, depending on the use for which they are put, was also discussed. It was considered that it would often be necessary to apportion the value of these items among the uses roughly. Another subject discussed by the Working Group was the distinction between repair and maintenance expenditure and capital expenditure. It was agreed that the criteria for this distinction should be whether or not the expected expenditures in question would be expected to increase the life or productivity of the durable good.

Classification and Definitions in current and constant prices

27. The Group discussed the various classifications used in the accounts and tables of the SNA based on paragraphs 42 through 52 of document E/CN.14/NAC/44. It was noted that these comprised:

- (a) A classification according to kind of economic activity designed primarily for use in the industrial classification of establishment-type units;
- (b) A classification of all goods and services;
- (c) Classifications by purpose of expenditures made by government and private non-profit bodies serving households;
- (d) Classifications of household goods and services according to durable, semi-durable, non-durable goods and services and according to object of expenditure;
- (e) A classification of gross capital formation according to type of assets; and
- (f) A classification of exports and imports of goods and services.

28. The Group emphasized that for purposes of developing countries, it would be valuable to supplement the classification of industries according to kind of economic activity with a classification into

modern and traditional modes of production. A number of attributes needed to be taken into account in the distinction between modern and traditional modes of production, for example, size of the unit, whether or not power was used, the type of equipment employed, mode of organization, the extent to which the products were marketed and the kind of activity carried on. In one country of the region, three categories were distinguished, namely, modern, semi-modern and traditional. It was agreed that the exact way in which the distinctions between modern and traditional modes of production were drawn, varies from one country to another. The discussions of the criteria necessarily to be used for the purpose had indicated that it was not feasible to recommend internationally precise ways of making the distinctions. This was also so in the case of the classification into urban and rural areas. It was desirable that where such classifications were used, they should be clearly defined in the relevant publication so that users of the data may be able to interpret the information provided.

29. Considerable interest was shown in the classification for goods and services by type. Questions were raised concerning the appropriate classification of certain items, such as palm fruits which were not cultivated but were collected in the forests, the oil which was derived from them, and the mixed activities which took place in the case of farm households. It was explained that palm fruits collected in the forest should be classified under forestry products, whereas those cultivated should be under agriculture, and that the oil extraction should be treated as manufacturing. It should, on the whole, be feasible to separate the agricultural activities of households from their forestry and non-agricultural activities. In most instances there would be no problem conceptually in separating the outputs and inputs of these activities and to define agricultural establishments in terms of agricultural holdings. This was the case since in the countries of the region common overhead expenses in respect of the various kinds of activity carried out by households were not very important.

30. The Group next considered paragraphs 53 through 71 of document E/CN.14/NAC/44, which concerned the definitions of output, intermediate consumption and the components of value added.

31. The definition of the gross output of industries and of the other producers was first discussed. It was pointed out that the output of industries included the imputed rent of owner-occupied dwellings and the production of durable goods for gross capital formation on own-account. In the case of banks and similar financial institutions, it was necessary to include imputed in addition to actual, service charges in their gross output. This was the case because much of the return for these services consisted of the excess of the property income they received over the interest they paid out. In the SNA this imputed service charge was treated as the intermediate consumption of a nominal financial establishment in order to avoid the difficulties of allocating it to the intermediate consumption of the various industries. In

the case of casualty insurance companies gross output was equivalent to the value of premiums received during a period of account reduced by the claims paid out. Since in the case of life insurance companies the premiums received include an element of saving, the service charges were equal to the premiums less the sum of the claims paid out and the amounts credited to the reserves of the companies in respect of their liabilities to the policy holders, reduced by the interest to the policy holders that was credited to these reserves. The interest represented payments to the policy holders for the use of these reserves in the investment of the insurance companies.

32. In the field of agriculture, it was noted that data on the production of crops usually referred to the quantities harvested. In the SNA, the definition of gross output excluded that part of the crop harvested on a holding which was used as intermediate inputs on the holding, e.g. seeds or feeds.

33. The Group noted that intermediate consumption consisted of non-durable goods and services which are used up in the process of production, but that minor items with a life-time of more than one year were sometimes included for practical reasons. It was also noted that included were durable goods acquired primarily for military purposes, direct purchases abroad on current account by government services and receipts of goods and services transferred from one government to another. A distinction was made in the SNA between the building of barracks, military schools and military hospitals, on the one hand, and housing provided to families of military personnel and schools for the children of members of the armed forces, on the other. The former type of expenditure was treated as intermediate consumption of producers of government services, while the latter was treated as fixed capital formation. The reason for this difference in treatment was that the former type of expenditure was primarily for military purposes, while the latter was primarily on facilities for civilian purposes, which were identical in character to private and other public facilities.

34. The Working Group took note of the components of value added, that is, compensation of employees, operating surplus, consumption of fixed capital, and indirect taxes reduced by subsidies. The definition of indirect taxes was pragmatic, based on the manner in which they were dealt with in business accounting, that is whether or not normally charged to business expenses, and the way in which they were levied. Indirect taxes included the operating surpluses of government fiscal monopolies as well as consistently large surpluses of government enterprises, as a result of government policies. In the case of public trading corporations, whether their consistently high levels of operating surpluses should be treated as indirect taxes or not, depended on two conditions. (a) Whether the corporation was a monopoly and (b) if so, whether the corporation's operating surplus was consistently higher than the normal level of operating surplus of similar kinds of private enterprises; or, alternatively, (a) whether it was a monopoly, and (b) whether it was established primarily for the purpose of raising revenue,

e.g. a tobacco monopoly. The question of what constituted a normal rate of return for a business enterprise was raised. The Group agreed that this rate varied from country to country and would have to be established by the national accountants based on conditions prevailing in the countries concerned.

35. The Group went on to examine the definition of the various components of final demand, namely, final consumption expenditure of government and private non-profit services and of households, gross capital formation and exports, as well as the definition of imports.

36. It was noted that the final consumption expenditure of government services and private non-profit services to households was defined in the SNA as equal to the services they produce, i.e. their gross output less their non-commodity sales and commodities produced (including their own account fixed capital formation). As the gross outputs of these services could not be directly measured or evaluated, they had to be estimated from the side of inputs, namely, by equating gross output to gross input, which in turn is the total of compensation of employees, intermediate consumption, consumption of fixed capital and indirect taxes.

37. Problems encountered in estimating final consumption expenditure of government services and of households, included the assignment of individual transactions to one or the other of these consumption categories, were discussed. The criterion used in classifying such consumption expenditure was that whenever goods and services were provided by government services directly to persons, whether free of charge, at reduced cost or at full cost, the items acquired by government services from industries or private non-profit services should be treated as the intermediate consumption of government services. Where industries or private non-profit services supply goods and services directly to individuals, which are entirely or partly paid for by government, such expenditure would be classified entirely as final consumption of households or intermediate consumption of government, depending on the extent of choice left to the individual consumer as to where to buy and on what terms these goods and services could be purchased.

38. The Group further noted that work-in-progress in heavy machinery and equipment which are usually produced on order and take a long time to finish, should be included in the increase in stocks of the producers of these goods, while work-in-progress on buildings and other construction should be considered as fixed capital formation of the units for which the work was carried out.

39. The question was raised whether to consider purchased machinery and equipment as fixed capital formation. The treatment to be accorded should be that machinery should be counted as fixed capital formation only after it had been put in place for use. The same should be considered as increase in stocks if it was not so installed. In practice,

however, in some countries it would be difficult to ascertain from industrial enquiries whether the purchased machinery or equipment was in fact installed and such machinery or equipment would have to be considered as part of fixed capital formation. This was especially the case where estimates of fixed capital formation were obtained by means of the commodity-flow approach.

40. The question whether petroleum or mineral exploration expenditure should be considered as capital formation was raised. The Group noted that in the SNA all research and exploration expenditure was treated as intermediate consumption except that part of the expenditure that was embodied in construction (e.g. structures, roads, wells, mining shafts, etc.), for the reason that such expenditure was not embodied in concrete durable goods and might not lead to concrete results which could be valued. Consequently, if a unit (a private or government enterprise) undertook mineral exploration, purchased materials and paid wages and salaries, etc., during a period under investigation, say a year, and there was no production of minerals or construction works, the gross output of the establishment might be considered to be zero; and then both its value added and operating surplus would be negative. The absolute value of the negative operating surplus would exceed that of the negative value added since the value added would include positive entries for the wages and salaries, allowances for consumption of fixed assets and any indirect taxes paid out by the unit. If the mining unit were a subsidiary or branch of a parent enterprise abroad, the expenditures of the unit could be treated as services rendered to the parent enterprise abroad (as export of the country). The expenditures of the unit on intermediate and primary inputs would then be equated to the value of the gross output of such services rendered (i.e. production of the country) and consequently the product of the local mining industry. If the mining unit were a government department and if it operated at any appreciable scale, the unit should be treated as an industry, which in turn sold a service to producers of government services. The value of the gross output of this service equalled the expenditures of the unit in question on intermediate and primary inputs.

41. The Group noted that external trade statistics, which are compiled on a physical movement basis, had to be adjusted for coverage, timing and valuation in order to arrive at imports and exports data needed for national accounts purposes. Similar adjustments had to be made to data obtained from exchange control sources, which data were largely based on receipts and payments.

42. The Group further examined the category "other goods and services" that enters into a country's imports and exports. Queries were raised as to why direct purchases abroad by government on current account were classed as other goods and services in the SNA while direct purchases abroad by government on capital account were classed as commodities. This distinction was made for both practical and formal reasons. On

the practical side, information on the commodity composition of direct purchases abroad by government on current account, which do not enter the country, was usually unavailable whereas direct purchases abroad by government on capital account consisted mainly of structures (e.g. embassy buildings) and purchases by trade missions and the commodity composition of these purchases could be obtained from government accounts. A formal reason for the differential treatment accorded to these two types of purchases was that capital goods obtained from abroad should be routed to the capital formation accounts by the commodity accounts through imports, while the current purchases abroad should be routed directly to the intermediate consumption of government.

The compilation of accounts and tables in current and constant prices

A. The basic data required and methods of estimation in current prices

43. The Group discussed the basic data required for the compilation of accounts and tables at current prices and the methods of estimating the data on the basis of paragraphs 2 to 67 of document E/CN.14/NAC/45. "The methods of compilation of and the sources of data for the SNA accounts and tables on goods and services". It was noted that in order to use the commodity-flow approach for purposes of compiling the accounts and tables of the SNA on goods and services, estimates were needed of the supply and use of commodities and of other goods and services.

(a) The supply and use of commodities

44. The supply and uses of commodities at producers' values were first considered. An illustration was given, in the form of a single table, showing the use of the commodity-flow approach in order to build up figures of the total supply of commodities from data on domestic output and imports classified by commodity groups and in order to distribute this supply in the case of each group among intermediate and final uses. It was emphasized that the table shown was a simplified version of the corresponding SNA tables in that the classifications of commodities and intermediate and final uses were much less detailed. The supply of each commodity group might be estimated from the following sources, as appropriate: production statistics, relevant sample surveys and customs statistics. Since most groups of commodities had different uses it was important that each item should be properly examined before distributing it among the uses. Also, any relevant data obtained from purchasers would be expressed in purchasers' values, and estimates of trade and transport margins would have to be deducted in order to arrive at producers' values. Since some countries might not have the basic data required in order to distribute the supply of commodities at producers' values, an alternative, which was illustrated in another table of document E/CN.14/NAC/44, was to estimate the supply and use of commodities at purchasers' values. Countries which found it easier to make estimates of certain uses of commodities directly, would then need to make adjustments for trade and transport margins in order to estimate the supply of the commodities in question.

(b) The supply and use of other goods and services

45. In the case of estimates of the supply and use of other goods and services, the Group considered a condensed illustrative example of how to arrange the data needed. The total supply of goods and services was divided into the domestic output of government and private-non-profit services, the domestic services of households, and the direct purchases abroad of resident households and producers of government services. These supplies were distributed among the intermediate consumption expenditure of the relevant non-profit producers and the final consumption expenditure of households. The discussion of the data required to make these estimates, indicated that the outputs of goods and services by government and private non-profit services should be recorded according to kind of economic activity in as much detail as was practicable. This would often require a reclassification of the budgets and accounts of government.

(c) The gross outputs and inputs of producers

46. The Group next considered the accounts and tables of the SNA which related to the gross outputs and inputs of industries and of other producers. It was observed that the output side of the production accounts for industries covered the gross output of both the characteristic and uncharacteristic products of the industries and that the input side dealt with intermediate consumption and components of value added.

47. It was agreed that these estimates should preferably be based on annual production statistics. However, such statistics did not usually cover very small enterprises or service industries; and it would be necessary to undertake special small-scale sample surveys in order to obtain the required basic data. A number of lacunae were also pointed out in the available basic statistics in respect of agriculture, forestry and fishing. For example, agricultural censuses were usually taken about 10 years apart and did not usually provide much information on outputs and inputs. Although many countries conducted current surveys for collection of agricultural statistics in the intercensal years, the surveys were not always adequate, particularly in terms of the coverage of all agricultural production in the entire country. In the case of wholesale and retail trade, data were needed on gross margins in order to use the commodity-flow approach. In the absence of distributive-trade censuses, it was suggested that small-scale sample enquiries should be undertaken in order to determine these margins according to class of commodity. Another method of estimating the gross margins added by distributive trade and transportation was to determine the ratios between users' prices on the one hand, and producers' and import prices on the other, in the case of each class of commodities and uses; and to apply these mark-ups to the relevant quantity figures of commodities. It would also be necessary to measure the ratios of value added to gross margins for the distributive trades through small-scale

sample enquiries. The Group agreed that figures of employment and wages and salaries would not yield useful data for purposes of estimating the value added or gross margins of the distributive trades.

48. At this point, it was emphasized that a network of coherent direct enquiries into households and establishments was needed in order to gather the basic data required for national accounting estimates. Attention was also called to the necessity to devise economical ways of carrying out the required surveys.

49. Other questions raised concerned (a) the differential prices and wastage occurring in agriculture and (b) the separation of values for passenger and freight transport. The latter receipts were combined because of the transport arrangements in some countries of the region, where no receipts were issued in respect of takings.

50. In the case of differential agricultural prices, it was pointed out that there may be three or even more types of farm-gate, or proximate, prices for a commodity, namely prices of goods destined for export, prices for goods destined for urban areas, prices of goods sold in local markets, and prices for the part of the commodity used by the farmer himself. Ideally, one should gather farm-gate prices in terms of each of the different uses. Such prices would reflect differences in quality, in the markets involved and in the relevant government policies. Distinctions should at least be drawn between the export prices and the other prices. However, in practice, these distinctions in farm-gate prices are not generally made in the statistics of the countries of the region. In the case of the wastage of agricultural commodities in farms, it was recommended that the amounts involved should be treated as intermediate consumption, instead of being deducted from gross output.

(d) Problem of estimating consumption of fixed capital

51. The Group examined the problem of estimating consumption of fixed capital and recognized the need to obtain data on depreciation in terms of the replacement value of fixed capital. It was noted that in current practices of countries of the region, the basis on which estimates of this flow were made were vague. In these circumstances it might be preferable to use the flows "gross saving", "gross operating surplus", etc., instead of attempting estimates of the consumption of fixed capital.

52. The Group discussed the various methods suggested in paragraphs 41-42 of the document E/CN.14/NAC/45, in arriving at useful estimates of consumption of fixed capital on a replacement value basis, and considered the perpetual inventory method to be desirable for use in developing countries.

(e) Direct estimates of value added.

53. It was noted by the Group that some countries arrived at their estimates of value added by summing up direct estimates of its

64. The Group discussed the relative advantages and disadvantages of double and single deflation in making constant-price estimates of value added. It was agreed that the main advantage of single deflation was that there was no need for detailed information in respect of the current period for which constant-price estimates were made concerning the quantities of the various commodities entering into intermediate consumption. However, the ratios of inputs to outputs often changed over time and the value-added weights built into the indexes of production that were used in single deflation assumed that the structure of the output of the industries in question had not changed since the base years. The main advantages of double deflation, coupled with commodity-flows were that assumptions were not made about the input-output relationship or the structure of activities of industries in the current period as compared with the base year. Full account was taken of the actual changes in these respects. The disadvantage of double deflation, in addition to the demands for data, was that it could result in negative value added at constant prices if marked changes occurred in the relative prices of the substitutable intermediate materials of a given industry.

65. In connexion with that discussion it was suggested that the countries of the region should conduct annual inquiries into at least the larger establishments with a view to gathering data on intermediate inputs and gross outputs classified according to type of commodities.

(b) Requirements for constant-price data and other general considerations

66. The attention of the Group was drawn to the importance of compiling national accounting data in constant prices. It was essential to have the constant-price statistics for such purposes as measuring the growth in the output and productivity of an economy, ascertaining bottle-necks to expansion, setting realistic targets for development, and matching the demands for, and the supply of goods and services, labour and fixed assets. The planning and appraisal of economic development and the diagnosis of the problems encountered, required constant-price data on the domestic production and supply of goods and services and on the uses to which these goods and services were put. Information on the trends in prices was also needed. The Group noted that a meeting on the subject of price and quantity statistics, in relation to national accounting in constant prices and to other uses of these data, had been held in the region by ECA and the Statistical Office of the United Nations and that the latter Office would prepare a manual on national accounting in constant prices and systems of price and quantity statistics. The Group's attention was also drawn to two useful publications on this subject, namely, "Quantity and Price Indexes in National Accounts," by Professor Richard Stone and published by O.E.E.C. and a recent publication of O.E.C.D. entitled "The Measurement of Real Product", by T.P. Hill.

67. It was noted that emphasis was given in the SNA to constant-price estimates in market prices. The factoring of flows valued in market prices into quantity and price components was more feasible than when flows were valued in approximate basic values or factor-cost values, did not raise certain anomalies connected with the other values, and reflected the circumstances involved in market transactions. Reactions for this are contained in Chapter IV of the publication on the SNA, dealing with the system as a basis for quantity and price comparisons. Constant-price series on total and commodity-type indirect taxes and subsidies were also included in the SNA.

68. At this juncture questions were raised in respect of (a) methods of estimating subsidies and indirect taxes at constant prices and (b) how to deal with the revaluation of a currency in foreign exchanges. It was noted that subsidies or indirect taxes which were based on the quantity of given commodities sold, produced or purchased, could be expressed in constant prices by applying the base-year rates of the subsidies or indirect taxes to the current-year quantity of the commodities in question. If the subsidies or indirect taxes were ad valorem, then their base-year rates should be applied to the current-year value of the given commodities, deflated to base-period prices. It was indicated that while revaluation of the currency of a country in respect of those of other countries would affect the terms of trade of her exports in relation to her imports special adjustments were not required in the constant-price data of the national accounts on goods and services in these instances.

69. Other general points discussed relate to the choice of a base period and the index number formulae that should be used. The Group noted that while the SNA did not make any firm recommendation concerning the index number formulae, Laspeyre-type indexes were preferred in the case of quantities and Paasche-type indexes were considered suitable in respect of prices. The general agreement was that the choice of a suitable recent base period was largely a matter of convention. It would be however necessary to avoid the pitfalls of using an unusually good or bad year, or run of years in the case of agriculture, as the base period.

(c) Agriculture, Hunting, Forestry and fishing

70. The Group next considered paragraphs 74 to 76 and 89 through 92, which dealt with gross output and input of producers in agriculture, forestry, hunting and fishing.

71. It was noted that the major practice in the region for purposes of estimating the output of agriculture in constant prices, was to take the quantities of the main crops and livestock produce at base year prices. It was of course necessary to make estimates for the minor

crops as well. This might be done by deflating their estimated value in the current period by the relevant series of farmer's prices, or by multiplying current-year quantities by base-year unit values. In many cases, rough estimates only were made in the case of minor crops.

72. The assumption in the first sentence of paragraph 75 that the trends in the output of agricultural services and in agricultural and livestock production at constant prices were the same was questioned. It was considered that if these services were important, information should be gathered through a small sample on the value and related prices of their services.

(d) Mining, manufacturing, electricity, and gas and construction

73. In discussing paragraphs 77 - 78 of document E/CN.14/NAC/45, which concerned mining, manufacturing, electricity, gas and construction, the Working Group noted that the problems, methods and basic data in respect of constant-price estimates of gross output and value added differed, depending on the mixture and complexity of the products and intermediate materials.

74. In the case of mining, industries manufacturing a restricted range of standardized final goods, and electricity and gas production, it was usually feasible to use a combination of quantity indicators and base-period prices for purposes of making the constant-price estimates. Series of quantities and producers' prices which were comparable over time, could be compiled without much difficulty in respect of the products which accounted for the bulk of the gross output of industries. This was often also true for the intermediate materials that they consumed. When the prices at which a given product was sold differed systematically with the kind of buyers, amount sold, etc., ideally separate indicators of quantity and base-period price should be used in the case of each portion of the product. Not infrequently, the detailed series of index numbers included in industrial production indexes yielded suitable quantity indicators in respect of value added, provided the base period for these indexes was recent enough, say within the five years or so preceding the year to which the constant-price estimates referred.

75. However, in case of industries manufacturing fabricated complex durable goods and in the case of construction, it was generally impossible to gather sufficiently comparable indicators of the gross output of the commodities. The products were too complex for purposes of devising suitable measures of quantity in terms of a few characteristics; and they varied considerably in character and quality from one transaction to another. It was therefore desirable to use price series, if possible, in deflating values of gross output to constant prices. Price series were often also more suitable indicators than quantity series for purposes of converting the value of gross output to constant prices when an industry produced a range of commodities and six or so

of the commodities did not account for the bulk of the gross output. Price series as well were appropriate indicators, if compilable, in the case of the intermediate consumption of an industry where complex, highly fabricated goods were used or where most of the consumption was accounted for by a wide variety of items. In view of the great difficulties of compiling suitable price series in respect of highly fabricated complex manufactures the Group noted that countries in various regions of the world found it necessary to resort to indicators of man-hours worked, adjusted for changes in productivity, quantities of intermediate materials consumed or the like for purposes of constant-price estimates of value added of industries manufacturing these goods. Where it was feasible to compile quantity or price indicators in respect of gross output, but not in respect of intermediate consumption, single deflation was commonly used.

(e) Distributive trades and transportation of goods

76. The Working Group recognized that for purposes of the commodity-flow approach to constant-price estimates, it was necessary to have reliable estimates of the gross margins in constant prices so that the distributive trades and transport added to producers' prices. In view of the importance of the wholesale and retail trade in many of the countries of the region, reliable estimates of their value added were also needed. Alternative ways of making these estimates were discussed.

77. One approach was based on a large-scale benchmark enquiry and small-scale annual sample surveys of the distributive trade. Information should be sought in both these enquiries on the value and quantity of the sales and purchases of merchandise by the distributive trades, classified according to kind of commodity, on their stocks of merchandise and on their expenditures on supplies and services. Based on these data, constant-price estimates could be made in respect of the quantity and price (unit value) of the gross margins for the various types of commodities sold and in respect of the value added of the distributive trades. In the case of the transport of goods by rail or by water organized by shipping companies, the required estimates, namely (a) quantity, for example, ton-kilometers and freight rates, classified according to type of commodity and (b) intermediate expenses, should be available from the administrative and accounting records of the companies. This might also be the case for large-scale, regulated road carriers. In the case of other road carriers, it would be necessary to rely on sample traffic enquiries for these data. It would be desirable to use a combination of the price and quantity indicators in this approach to constant-price estimates of trade and transport margins.

78. Another approach was based on the development of a coherent system of prices statistics. It was necessary to gather and compile prices classified by commodity on (a) producers' values and import values, including duties in respect of the supply of the commodities and (b) purchasers' values and export values in respect of the disposition of

the commodities to various uses. The difference between the average supply price during a period of account and the average purchasers' price in the case of each type of disposition of each class of commodities, would give the price component of the relevant trade and transport margin. Price indexes for purposes of deflating the margins to base-period prices could be compiled from the figures of differences in price and of quantity in respect of each use and class of commodity. The deflated gross margin might be used to extrapolate the value added of the distributive trades and the transportation industries in base-period prices to the current period.

(f) Other services

79. It was pointed out that for the other services, series of price indicators were preferable deflators since quantity indicators would not reflect the wide range of different qualities in the case of each type of service. The series of prices should be gathered as part of price indexes in respect of household consumption expenditure. Statistics were of course also required in respect of the receipts of the services.

(g) Final demands

80. The Working Group considered the compilation of constant-price data on final uses of goods and services, based on paragraphs 93 through 101 of the document under discussion.

81. It was observed that a number of countries used the commodity-flow approach in order to compile a number of these series of data. The required figures in respect of each kind of disposition were the sum of the constant-price data on the supply of goods and services in producers' values and on trade and transport margins in the case of the relevant commodities. Constant-price estimates were often made directly in the case of exports from external trade statistics. It was noted that it would be necessary to make constant-price estimates directly in the case of the part of government and private non-profit services' consumption expenditures accounted for by their value added. Direct estimates of the portion of their consumption expenditure which consisted of purchases of goods and services were also thought to be desirable. It was suggested that these estimates might be made from samples of purchase or delivery invoices or from accounting journal entries.

82. In the course of the discussion questions were raised concerning
(a) the deflation of non-resident households' consumption expenditure
(b) the deflation of the value added by producers of government services
and (c) methods of making constant-price estimates of the gross domestic product from the income approach.

83. As regards the deflation of the consumption expenditure of non-resident households, it was explained that none of the practicable

methods were wholly satisfactory because of the lack of detailed information on the commodity composition of the expenditures. It was usual to deflate the outlays by means of price indexes constructed on the basis of the bundle of goods and services which non-residents might be assumed to have bought.

84. In the case of the constant-price estimates of the value added of producers of government and private non-profit services, annual increases in the salary of government employees should not be thought to reflect changes in productivity. The indicators to be used might be the number of employees, in full-time equivalents, classified according to scales of wages and salaries and categories of occupation during the base-period.

85. The Group noted that constant-price estimates of GDP from the income approach raised difficult conceptual and practicable problems. The indicators required for this purpose concerned the quantity of labour and capital used in production and their joint productivity; and, even in the case of developed countries, those indicators were not generally available in suitable form. In any case, in order to measure the joint productivity of labour and capital, it was necessary to have constant-price estimates of the gross domestic product measured in terms of the outputs and inputs of goods and services.

The problems and practices of African countries in the compilation of production accounts and commodity balances

A. General considerations

86. The Group considered background document E/CN.14/NAC/47, entitled "Problems and Practices of African Countries in the Compilation of Production Accounts and Commodity Balances", and took note of the relatively slow progress in the respective countries of the region in introducing the revised SNA because of the lack of statistical personnel and/or basic data. Nevertheless, progress was being made toward that end.

87. The Group noted that assessments of reliability of national accounting estimates were not presented in the publications of many countries of the region. It was pointed out that while reliability assessments were of considerable importance to both producers and users of national accounts statistics, they often represent no more than the subjective judgements of the national accountants making the estimates; and would in most instances not necessarily apply to similar estimates for later years. Changes in sources of data or methods of estimation introduced later would affect the degree of reliability of the estimates. Reliability ratings were not considered to be of great significance by themselves; these ratings should be supplemented by detailed descriptions of sources of data and methods of estimation used.

B. Agriculture, hunting, forestry and fishing

88. The Group discussed the practices of countries of the region in compiling data in respect of agriculture, livestock, forestry, fishing and hunting; and noted the weaknesses in the basic data used in these estimates. Bench-mark data from censuses and surveys were often lacking; and the countries had to resort to rough methods of estimation. Estimates of crop production were usually based on estimates of acreages under cultivation and yields. In some cases where agricultural surveys were conducted over a number of years, estimates of acreages under different crops often varied considerably from one year to the next. Such variations were due partly to sampling errors and partly to non-sampling errors. These errors would obscure the real changes in agricultural production from year to year. Data on yields were also not always based on well-organized crop-cutting experiments. In the countries where crop-cutting experiments were introduced, they were limited to a few key crops only and carried out on a small-scale. It was noted that in a number of countries of the region, estimates of crop production had to be obtained indirectly, for example from exports and marketing data for major exports crops and from consumption and marketing data for crops of wide local consumption. A large number of countries also relied on their field extension staff for estimating crop production. Similar difficulties were experienced in countries of the region in estimating production from livestock, forestry, fishing and hunting.

89. Difficulties were also experienced by countries of the region in estimating the intermediate consumption of agriculture. In some countries small-scale farm management surveys, import statistics, etc., were used. Serious difficulties were encountered in estimating the compensation of employees paid in agriculture because of the lack of data on hired farm labour. Estimates of consumption of fixed capital also presented unresolved problems. This was due to the lack of bench-mark data on farm buildings and the agricultural machinery and equipment in use.

90. In the course of the discussion, the Group was informed by a representative of the FAO that a Handbook of Economic Accounts for Agriculture would be jointly drafted by the Statistical Division of FAO and the Statistical Office of the United Nations.

C. Non-Agricultural activities

91. The Working Group considered paragraphs 44 to 86 of document E/CN.14/NAC/47, which concerned the industries of mining, manufacturing,

electricity, gas and water, construction, commerce and transport and other services, and the producers of government and private non-profit services. The discussion dealt with the country practices and problems in these fields in respect of the compilation of the production accounts and commodity balances. Problems such as the following were cited. In some countries of the region, because of the lack of collaboration between the statistics offices and the inland revenue departments, it was not possible to make adequate use of income tax returns in national accounting. There was very little, if any, data from which to estimate own-account construction of houses in rural areas, particularly in the case of traditional-type housing; and some countries did not take these transactions into account. The treatment of carriers operating in several countries and in international traffic differed from one country to another and from the international recommendations. In the case of producers of government services, the coverage of local government was limited and the lack of uniformity in accounting definitions, classifications and records, even between various levels of government in the same country, raised serious questions of comparability in the data that was compiled.

D. Final demands

92. The Group next considered paragraphs 87 to 89, concerning the final consumption expenditures on the gross domestic product. It was observed that because of the lack of households consumption and expenditure surveys, it was not feasible to estimate the composition of private consumption expenditure according to object in a large number of countries. Many countries of the region estimated this flow as the residual between the gross domestic product from the side of production and the sum of the other expenditures on the product.

93. The Working Group also considered paragraphs 90-95 of the document E/CN.14/NAC/47, relating to the estimation of increase in stocks, gross fixed capital formation, and exports and imports of goods and services. The Group noted the various problems encountered in countries of the region in estimating these flows.

94. The problem of estimating the product of livestock raising was discussed in connection with estimates of increase in stocks and fixed capital formation. The product of livestock raising consisted of (a) increments during the period in question in the stock of livestock and (b) the number of livestock sold, slaughtered and put to other uses during the period. Increments in stock included not only the livestock born during the year but also the growth of the animals. For making such estimates an inventory of livestock by type and age would be required.

95. The sources of data and methods of estimation of fixed capital formation in breeding and draught animals, dairy cattle and animals raised for wool-clipping, were briefly reviewed by the Group. It was

noted that the treatment of dairy cattle and breeding and draught animals as fixed capital assets in the revised SNA, instead of as stock in the old SNA, was due largely to the regional discussions that were held in the ECAFE and African regions. For the estimation of this flow, an annual inventory of livestock by type and age would be needed. Import and exports statistics would also provide useful information. It was emphasized that in the revised SNA, consumption of fixed capital was not to be estimated for these animals. Losses in this type of livestock would be considered as a capital loss; slaughter of animals would be treated as a transfer from the capital formation accounts to the stock account.

Input-output Analysis

A. The broad uses

96. The Group examined and discussed the document, "Objectives, Concepts and Methods of Input-Output Analysis" (E/CN.14/NAC/46/Rev.1). The links between the systems of national accounts and of input-output analysis as described in paragraphs 3-13 of the document, were considered and the character of analysis and its applications, as expounded in paragraphs 14-64 of the document, were discussed.

97. The principal uses of input-output analysis in the case of developing countries consisted of (a) description of the structure of production of the economy at a given point of time, (b) description of relationships between uses (intermediate inputs and final demands) and resources (local production plus imports), and (c) checking the internal consistency of national accounts estimates. In some developed countries the input-output approach was also being explored for purposes of studies concerning the contamination on the environment by pollution, for example, the measurement of the costs and benefits involved in reducing the amount of pollution.

98. Though most countries of the region were still at an early stage of statistical development, the Group considered that the study of the input-output approach imposed a discipline and provided a framework for devising data collection programmes and for systematic estimation through the disaggregation of the series on goods and services and the balancing of estimates of uses against resources in compiling national accounting data. Input-output tables delineated the structure of the production and use of goods and services in an economy and indicated the role played by imports and exports. The integration of input-output tables into the national accounts, as in the SNA, furnished integrated highly aggregated data and disaggregated data for purposes of economic analysis and policy making. The input-output coefficients obtained were however unstable when rapid developments were occurring and new technologies introduced. In these circumstances the input-output data for one period of time could not be used for purposes of projections and the like.

B. The form of the SNA input-output tables and sources of data

99. The Group then examined Tables 8 and 9 of the document E/CN.14/NAC/46/Rev.1. The tables were examples of production matrices valued in producers' prices and approximate basic values, respectively. It was pointed out that tables 8 and 9 of the document were very much simplified versions of the matrices from which standard tables 2 and 3 of the SNA were drawn. The SNA also included simplified versions of standard Table 2 in Tables 2a and Table 28. A simplified version of Table 3 was not presented in the SNA, though more condensed versions of Table 3 could be developed. In the examples given in Tables 8 and 9 of the document, only 4 industries and 4 commodities were included for purposes of illustration. It was emphasized that to make effective use of matrices of this type, a much larger number of industries and commodities would be needed. The production matrix might profitably be rectangular in shape, that is showing more commodities than industries.
100. The Group recognized the need to use commodity classifications which are cross-classified by industries in the work on production accounts and in particular, in compiling basic input-output tables. One such classification was the Draft International Standard Commodity Classification of All Goods and Services (5ST/STAT.47), prepared by the United Nations Statistical Office.
101. The Group examined data sources and methods for compiling the aforementioned tables.
102. It was noted that data on final demands might be obtained through the commodity-flow approach and direct inquiries into enterprises and households. The larger business enterprises were often willing to supply data on their outputs and inputs once they realized the values of doing this. In the case of small business units, interviewing was the only method of obtaining data on outputs and inputs. Simplified questionnaires would be needed in small business units and the data should be collected on a sample basis.
103. It often proved necessary to obtain data on government purchases classified according to commodities from basic records. One such technique that had been successfully used was to sample government purchasing agencies' journals, purchase orders, or delivery slips. The sampling procedure used in this case could be simple.
104. For data on private consumption expenditure classified according to commodities that were characteristic of the various industries, the commodity-flow method and household expenditure surveys furnished the proper bases for making the pertinent estimates.
105. For estimation of trade and transport margins, it would be necessary to follow through the chain of distribution in commodity detail. Alternatively, adequate price systems could be built in respect of producers'

prices and domestic prices of imports, on the one hand, and purchasers' prices for intermediate goods, for fixed assets and for final consumers and f.o.b. prices for exports, on the other. Trade and transport margins could then be assessed from these price series in commodity detail.

106. It often proved to be most difficult to obtain information on stocks by commodity detail.

107. One important source of information was external trade statistics. However, they often suffered from a number of deficiencies and adjustments to recorded data would be needed before they were used for the compilation of the basic input-output tables. The recorded data might be incomplete in statistical coverage (e.g. fish landed, cattle driven across borders, smuggling or illicit trade), declared values might be falsified in order to evade exchange control, goods might be sent on consignment for auction in foreign markets or at conventional values to foreign parent companies.

108. The Group briefly discussed current practices in countries of the region for the valuation of exports. In a number of cases, no adjustments were made for illicit trade or smuggling or for under-invoicing of exports on account of lack of information. In some cases, re-valuation of certain export commodities was carried out based on import statistics compiled by other countries. It was noted that where exports were sent by subsidiaries to their companies abroad fictitious book-values of exports (or even over-valuation in some cases) were declared, depending on levels of taxation prevailing. For certain commodities (e.g. diamonds), for which world market prices existed, such exports could be re-valued based on world market prices if information on the grade and quality of the exports were available.

109. The valuation of Table 9 of the document was considered by the Group. It was noted that the entries in table 9 were at approximate basic values instead of at producers' values. Approximate basic values were equal to producers' values less commodity taxes plus commodity subsidies. Commodity taxes were in general taxes charged in relation to the quantities of the commodities produced, sold or used. Import and exports duties were examples of commodity taxes, while property taxes were not, due to the fact that these taxes were not linked to physical quantities of commodities produced. Commodity taxes and subsidies varied with the type and quantity of the commodity produced or sold and with the use to which the commodity might be put, and varied from commodity to commodity. Subsidies might be paid to producers which purchased one particular type of material but not other types of material.

110. In input-output analysis the focus was on the stocks and flows of goods and services in quantities. As different units of quantities were not additive, data in value terms had to be used as a proxy. The

use of approximate basic values was advocated in the compilation of the input-output table because they would be free from the unequal incidence of commodity taxes on different commodities or on the various uses to which the same commodity might be put.

C. The underlying assumptions of input-output analysis and the required data

111. The Group noted that input-output analysis was based on three basic assumptions, namely that (a) each industry produced a single homogeneous class of products only with a single cost-structure, (b) the relationships between outputs and inputs (i.e. intermediate consumption and value added) were linear and constant and (c) the quality of outputs and inputs was uniform, so that monetary values could be used as proxies for physical quantities. However these assumptions were not satisfied in actual practice. This was principally due to (a) the production of uncharacteristic products, as well as a range of characteristic products, in the case of individual establishments, (b) the changes that occurred in the technology and size of establishments and the increasing returns to scale up to a point and the changing price structures and (c) the difference in the quality of the outputs and inputs of even the same commodity.

112. In the course of the discussion the RAS method, developed at the Department of Applied Economics, University of Cambridge, was described. The method represented an attempt at up-dating of a previous input-output table by incorporating later information on technical coefficients, based on engineering data obtained from selected larger establishments or selected industries. The method consisted of a process of interation and successive approximation and was considered suitable for use in situations where changes in technology were not very drastic. If changes in technology or scale of production were too drastic or widespread, it would be necessary to gather detailed information on outputs and inputs for each industry.

113. The Group agreed that for purposes of attaining a suitable degree of homogeneity in the gross outputs and the cost structure of given kinds of industry, it was essential to subdivide the establishments in these industries into modern and traditional modes of production and according to size. It was suggested that the degree of homogeneity needed in gross outputs and cost-structure of industries and in the quality, origin and disposition of commodities meant that in the case of the countries of the region the number of categories used in the classification of industries and of commodities should be 40 or so and 60 or so, respectively. There was general agreement that 10-15 categories would not yield data classified in sufficient detail for these purposes or for other analytical uses of the basic input-output tables. However, for checking of statistical consistency, a clarification of 10 to 15 categories would be sufficient. It was noted that for many uses, rectangular tables would be more useful than square tables since more detailed classifications for commodities than for industries was wanted

and was practicable. In order to be able to invert the table for purposes of computing the coefficients of the total demand, both intermediate and final, for the gross output of an industry, the rectangular tables could be converted to square tables by condensing the commodity classification into the industry classification.

114. The Group noted the importance of subdividing purchasers' values into approximate basic values, trade and transport margins and net commodity taxes in the case of the disposition of the domestic supply of commodities. This would markedly improve the usefulness of the value data as proxies for quantity data and lead to greater stability of input-output coefficients as compared to basic input-output tables constructed in purchasers' values only. It was considered that it should at least be feasible to separate out trade and transport margins and producers' values from the purchasers' values.

D. The preparation of input-output tables from the basic tables

115. The Group went on to examine the different types of input-output tables and the preparation of these tables from basic input-output data.

116. The attention of the Group was called to the various types of input-output tables that were commonly prepared. The types of input-output tables consisted of (a) commodity x commodity tables, (b) industry x industry tables and (c) commodity x industry tables. Each of these tables had been prepared in terms of (a) producers' values and trade and transport margins, (b) approximate values, trade and transport margins and net commodity taxes and (c) purchasers' values. Commodity x commodity or industry x industry tables were favoured in the SNA, depending on the uses to which the tables were to be put. For example, commodity x commodity tables were preferable for purposes of determining the implications of demands for the supply of commodities; industry x industry tables were advantageous for purposes of correlating primary inputs with demands for commodities.

117. It was noted that transfers of uncharacteristic products from the industry where they were produced to the industry where they were characteristic products, were often carried out by making use of technical information regarding these products and their cost structures. Information on the cost-structure of the commodities was generally not available on account of the difficulties involved in distributing overhead costs among the commodities produced at an establishment or a technical unit. The transfer of the direct cost associated with uncharacteristic products of an industry was often based on engineering data or personal judgements. However, in the case of the centrally planned economies and a few market economies, such information was based on detailed direct enquiries.

118. In the SNA, the transfers of outputs and associated inputs of uncharacteristic products from the industry where they were secondary to the industry where they primary, were to be done through algebraic

manipulation of the basic input-output tables. Use was made for this purpose of the assumption of either a commodity technology, an industry technology or a mixture of both. The commodity technology assumed that the cost-structure for a commodity was the same irrespective of the industry in which the commodity was produced, whereas the industry technology assumed that the cost-structure of a commodity depended on the industry in which it was actually produced. In general, the industry technology was the correct assumption to use for joint products or by-products, while the commodity technology was more appropriate in the case of subsidiary products.

119. The Group's attention was drawn to the distinction to be made between competitive and complementary imports. The former was defined as imports which were also produced in the country, and the latter as imports which were not produced in the country. It was noted that in developing countries, where rapidly changing structures of production were common, it was difficult to make meaningful classifications of imports into competitive and complementary categories.

E. The problems and practices of African countries

120. The Group considered document E/CN.14/MAC/43, "Problems and Practices of African countries in the compilation of input-output tables". It was pointed out that input-output tables had been compiled for 19 African countries at one time or another and that an increasing number of countries appeared to be interested in compiling such tables. However, the tables that had been compiled, were often out of date and the number of categories of industries or commodities employed frequently fell short of the number required for purposes of using these tables in economic planning.

121. Such sources as the following were used for purposes of gathering the basic material required for compiling input-output tables:

- (a) Industrial censuses or surveys for bench-mark years,
- (b) External trade statistics,
- (c) Government accounts,
- (d) Household consumption and expenditure surveys,
- (e) Data on agricultural production and prices,
- (f) Data on building and construction,
- (g) Distribution statistics,
- (h) Transport statistics, and
- (i) Prices statistics.

It was noted that the sources used had a number of shortcomings and that ad hoc surveys were often required. While the problems of lack of basic data in compiling input-output tables were similar to those that were experienced in compiling production account and commodity balances, the requirements for basic data were much more exacting. The lack of basic statistical data had therefore imposed serious constraints on the feasibility of constructing suitable input-output tables in the countries of the region.

ANNEX I

List of participants

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Mr. Abdoulaye Diop

Sierra Leone

Mr. E. Cummings-Palmer

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IIc. Intergovernmental Organizations

Organization for Economic Co-operation and Development (OECD)

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ANNEX II.

LIST OF DOCUMENTS

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| E/CN.14/NAC/43 | Problems and practices of African Countries in the compilation of input-output tables. |
| E/CN.14/NAC/44 | Structure, concepts, definitions and classifications of the SNA accounts and tables on goods and services (Prepared by the United Nations Statistical Office). |
| E/CN.14/NAC/45 | The methods of compilation of and the sources of data for the SNA accounts and tables on goods and services (Prepared by the United Nations Statistical Office). |
| E/CN.14/NAC/46/Rev.1 | Objectives, concepts and methods of input-output analysis (Prepared by the United Nations Statistical Office). |
| E/CN.14/NAC/47 | Problems and practices of African countries in the compilation of production accounts and commodity balances. |
| ST/STAT.47 | Draft International Standard Commodity Classification of all Goods and Services (United Nations Statistical Office). |
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