UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA

Workshop on Multi-sectoral Planning Models and Short-term Economic Forecasting for Policy Design in Development Planning and Management in African Countries

Moscow, USSR, 15-28 September 1986

REPORT OF THE WORKSHOP ON MULTISECTORAL PLANNING MODELS AND SHORT-TERM ECONOMIC FORECASTING FOR POLICY DESIGN IN DEVELOPMENT PLANNING AND MANAGEMENT IN AFRICAN COUNTRIES
- Speech of ECA representative,
- Discussion of working programme of the Seminar. Election of seminar leaders.

Topic 1: Integration of the informal sector in multi-sectoral development planning.

1.1 Rimashevskaya N.M. (CEMI AS USSR)
"Differentiated balance as an instrument of forecasting incomes and consumption of population".

1.2 Kovshov G.N., Burenkova E.E. (CEMI AS USSR)
"Simulation of transportation systems and of regional industrial infrastructure in economic planning".

1.3 Golansky M.M. (Institute of Africa AS USSR)
"Economic intensification potential and its disaggregation".

1.4 Kaba Camara (UNECA)
"Integration of the informal sector in economic development planning".

1.5 Alexander Adu Aboagye
"The urban informal sector in Africa: Implications for integration in development planning".

1.6 Country papers on the informal sector:
- Benin - Mr. Jules Ahodekon
- Congo - Mr. Félicien Diafoüka
- Senegal - Ms. Oumy Diagne
- Togo - Mr. Nyadzawo Eyelwe
- Kenya - Mr. Isaya Onyango

1.7 Discussions.

Tuesday, September 16:

Topic 2: Dynamization of input-output technical coefficients, experiments in long-term projection of economic growth in developing African countries.

2.1 Matlya I.S. (CEMI AS USSR)
"Input-output balance models complex".
2.2 Urinson Y.M. (State Computation Centre of the State Planning
Commission of USSR)
"Utilization of intersectoral models in the practice of
national economic planning".

2.3 Chernyavsky A.V.
"Methods of drafting prospective input coefficients for inter-industry models".

2.4 Nikitina G.V.
"Medium-term multisectoral planning by using tables of inputs and outputs in physical units and in values".

2.5 Martynov G.V
"Structure of complexes of related industries for optimized planning".

2.6 El-Egaily M.O. (UNECA)
"Dynamization of input-output technical coefficients, experiments in long-term projection of economic growth in developing African countries".

2.7 Se-Hark Park (UNIDO)
"UNIDO's work in modelling".
"An input-output analysis of linkages between industry and services and their Implications for employment generation".

2.8 Country papers on dynamization of input-output technical coefficients:
(a) Algeria: Mr. Abdun Ramdane
(b) Egypt: Mr. Abdel-Kader Hamza Said
(c) Tanzania: Mr. P.B. Rweyemamu

2.9 Discussions.

Wednesday, September 17:


3.1 Gurevich D.I., Shatalov S.I. (Institute of Africa AS USSR)
"Study and forecasting models of developing countries solvency".
3.2 Detneva E.V., Terushkin A.G. (CEMI AS USSR)

"Models of finance and value balancing of national economy turnover based on integrated economic information".

3.3 Albegov M.M., Koltsov A.V. (CEMI AS USSR)

"Regional economic models".

3.4 Thisen J.K. (UNECA)

"The treatment of price and balance-of-payment variables in short-term SAM-based forecasting models".

3.5 Krylov A. (UNCTAD)

"L'expérience de la CNUCED dans l'élaboration et le maintien des modèles économétriques pour la projection à court terme de la dynamique économique et les relations économiques extérieures des pays en voie de développement".

3.6 Gomez J. (DIESA)

"A prototype model for African developing economies with dynamic policy simulations".

3.7 Country papers on the treatment of prices and balance-of-payments.
- Rwanda: Mr. Sebahakwa Augustin
- Mauritius: Mr. Nikhil Treebhoohun

3.8 Discussions.

Thursday, September 18:

**Topic 4:** Elaborate modelling of the energy sector for improved energy balance in Africa.

4.1 Shevtsova V.E. (CEMI AS USSR)

"Analysis and modelling of energy state of Africa".

4.2 Bugembe P.K. (UNECA)

"Elaborate modelling of the energy sector for improved energy balance in Africa".

4.3 Country papers on elaborate modelling of the energy sector:
- Burundi: Mr. Bihuhura Edouard

4.4 Discussions.

4.5 Demonstration of work at computers.
Friday, September 19:

Topic 5: Economic and Scientific Cooperation between USSR and African Countries

1. Chetvertakov W.A.
   "State and perspectives of economic and scientific cooperation between USSR and African countries".

2. Report of ECA.

3. Discussions.

Saturday, September 20:

- Cultural programme.

Sunday, September 21:

- Departure to Riga, the capital of Latvian Republic for a study tour.

Monday, September 22:

- Cultural programme at Riga.

Tuesday, September 23:

Topic 6: Regional planning at the Latvian Republic Level

- "An agricultural model for the Republic of Latvian" - The State Economic Institute of the Academic of Sciences of Latvian Republic.

Wednesday, September 24:

- "An integrated input-output regional system" - The Scientific Research Institute of Latvian Republic State planning committee.

- Demonstration of work on computers.

Thursday, September 25:

- Departure to Moscow.

Friday, September 26:

- Summing of the results of discussion.

Saturday, September 27:

- Adoption of the report of the workshop.
- Award of certificates to the participants.
- Motion of thanks.
Topic I: INTEGRATION OF THE INFORMAL SECTOR IN MULTISECTORAL DEVELOPMENT PLANNING

1.1 The differentiated balance as an instrument of forecasting incomes and consumption of the population (Rimashevskaia) N.M. Prof. doct. of sc. econ. CEMI of AS of USSR).

The report analysed the procedure of elaboration of differentiated balance of incomes and consumption of the population (D.B.) Then author describes the model of DB, and the economic meaning of its indices. DB may be represented as a table and is considered within the frame work of the gross incomes and extended consumption by the population which represents in itself the entire volume of use values created for the satisfaction of human requirements and in particular the social services, medical services, and the level of life. There are three kinds of problems, that may be solved with the help of the BD models:

a) creation of the statistic base for balances;

b) analysis of the welfare of the population according to time scale and different groups of population;

c) forecasting and verification of the augmentation of the level of life of the population.

The model gives also possibility of management and regulation of social processes. This possibility gives the construction of the normative DB model, reflecting the designed development of social needs. The author proposes an important method for connecting DB model with the balances of different branches.


The paper present an approach to the problem of coordination of the national economic long-term forecasting and the need for resources in infrastructure branches, i.e. transport, supplying by materials and techniques, and storage systems. Transportation by itself as a sector of industry was studied for a long time before. The paper is dedicated to interconnections of the industrial sectors and infrastructural sectors, which are treated as inter-sectoral complexes, where the sectoral and territorial planning should fit one another. There is a system of models as a functional subsystem of the complex of models of perspective planning.

The method used as a method of mathematical theory of flows on transportation nets describes the information needed for the solving of the problem, and also the experience of calculation of the plan of transportation system development according to variants of national economic growth for 18 sectoral model and 24 regions. Also the report treated the question of modelling of regional transportation storage system in connection with the development of magistralic transportation system and multiregional economic growth.
1.3 Economic intensification potential and its disaggregation. (Prof. Golansky M.M., CEMI-AS USSR)

The report discussed the problem of a possible method of determining optimal distribution of resources between economic subsystems with the help of the self-development principle. It demonstrates how the country's potential of intensive economic growth must be broken over a longer-term period into the sub-potentials of individual economic subsystems to achieve maximum effect. Any other distribution would result in the under-use or losses of this potential. Optimal economic development (in terms of intensification) is described with the help of economic equilibrium functions. The economic optimum here presupposes maximized capacity of artificial human habitat (maximized fund of non-productive consumption) for a sufficiently long period of time.

Information about potential of intensification and its disaggregation is of great theoretical and practical interest for the planning of the developing countries searching way to progress. The proposed method gives an opportunity to estimate economical efficiency of the projects and the participation of each country.

1.4 Integration of the Informal sector in economic development planning (Mr. Kaba Camara - UN-ECA)

The Representative of the ECA Secretariat introduced the study on the integration of the informal sector in economic development planning in African countries. In his presentation, he noted the different aspects of the informal sector, the phenomena which had contributed to the emergency of this sector, namely the rural exodus, the uncontrolled urbanization, the imbalances between the labour supply and the labor demand; the global supply of goods and services and the final demand of goods and services, etc. He also indicated that the existence of this informal sector was influenced by the legislation, in the field of urbanization during the colonial period. As a result, the importance of the sector varies among the subregions and the African countries. He proposed seven criteria for the identification of the informal sector which cover several activities, such as retail trade, mechanical repairs, metal work, bakeries, etc. The informal sector contributes more than 10 per cent to GDP of certain countries, and employs between 40 to 60 per cent of the raw materials in the formal sectors of the economy.

However, there is no employment security, nor stable relationship with the other sectors due to lack of legislation, statistics, and assistance. The method and objectives of planning started only very recently to take into consideration this informal sector because they were oriented towards the realization of the important priority sectors. For the integration of the informal sector in the economic development planning there was need for adoption and realization of five objectives namely equitable distribution of national income, better training facilities in accordance with the needs of the economy, national mobilization and utilization of local savings, control of rural exodus and the urban growth; promotion of national enterprises without external capital as well as judicious choice of branches capable to respond to the demand of goods and services of the low income population. These general objectives needed to be supported by appropriate sectoral strategy, the implementation of structures of population and assistance, viable statistical instrument. In these conditions, the integration of the informal sector could be realized by the application of strengthened planning.
He showed a simple model having four sectors that would enable to analyse the determinants factors in the growth of the informal sector and the determination of the perspective of the sector. The model shows that the production of the informal sector is basically influenced by the orientation of the final demand, by the growth and distribution of total income, fluctuations in the employment rates, relative prices, consumer preferences the size of rural and non-rural households and the growth of the population. The analysis of the consequences of changes of the main variables identified lead to the essential recommendations aiming at the extention of the final demand of goods in the informal sector, an effort of improving the quality of products changes in the behaviour of the population as well as the administration and the entrepreneurs' operation in this sector. The rehabilitation of socio-cultural environment by information campaigns, education and training is also indispensable to improve the management.

In conclusion, he proposed the elaboration of sectoral plans of development, with the integration of the informal sector in the national development plans. He underlined that the need for each country to define the steps and means to implement such a planning process. He also indicated that the experiences of certain African countries such as Benin, Kenya, Senegal, Rwanda and Togo were encouraging and should be supported by a strong assistance from the international community.

1.5 ILO Presentation

The representative of ILO/JASPA (Mr. Alexander Adu Aboagye) presented a paper on "the urban informal sector in Africa: Implications for integration in development planning". He indicated that available evidence from African countries suggests that though the informal sector is not an enclave in the economies only few governments have considered the sector in the main stream of their development strategies. The issue of integration of the sector in development planning deals with the extent to which there is deliberate policy to influence the performance of the sector in achieving specific planning targets. By this approach, the sector could respond to official policy. Unfortunately, due to lack of experience in dealing with the sector attempts by governments have often yielded disappointing results.

The paper attempts to answer the following questions: Will integration enhance the development of the sector? Is it realistic to expect the sector to increase its role in the context of the present institutional framework? Given the features of the sector under what conditions is integration feasible? Are the planning authorities prepared to make the necessary resource allocation which will be required as a result of the integration of the sector in the planning exercise?

The paper notes that the lack of experience on the part of governments in dealing with the sector has often resulted in simply transferring to the informal sector the policies and measures which are often applied in the modern sector. Though this may involve the danger of premature formalization of the sector, the paper argues that some changes in the operation in informal activities may be necessary. In this way the sector would operate within a less hostile environment or also obtain the benefits which are often provided to the modern sector. This intern will reduce the risk of uncertainty in their operation.
In integrating the sector in the development planning the paper recommends the following: improved data collection for the informal sector and a mechanism for updating or revising the data on the sector; that the imposition of structures which do not take into account the features of the sector and aspirations of the artisans would run into serious problems; the large and heterogenous nature of the sector necessitates the selection of some few activities as priority areas for support; formation of co-operatives must be encouraged to warrant government assistance.

Finally, he concluded that the integration of the sector in the planning process may involve re-allocation of government resources. But the real issue is whether, given the lack of real growth in government resources, the potential exists for such re-allocation of resources and re-orientation of policies in favour of the informal artisans.

1.6 Country Papers on the Informal Sector

(a) The Experience of Benin

The representative of People's Republic of Benin presented a paper entitled "The integration of the informal sector in multi-sectoral planning: Case study of Benin" in which he pointed out the issue of integrating the informal sector in the planning process in his country. He said that although this sector is statistically unknown, it nevertheless remains a tangible reality. It plays an important role in contributing to the formation of GNP and to the solution of problem of employment, as well as to the socio-economic development of the country. In particular, traditional trade was still a big problem for government as regards its integration in development programmes. However, the artisan sector was relatively easy to integrate in the programme.

The informal sector includes a variety of activities such as small-scale processing enterprises, artisan traditional trade, mobile merchants, the domestic workers, etc. Due to the lack of statistics and accounting of production, the informal sector is not well known in Benin, quantitatively. However, as far as traditional trade is concerned, it is not well structured and its activities are known only through its volume of turnover. The 1979 census gave a number of 233,000 traders, of which 20,000 only are registered. That is 8 per cent. Thus 92 per cent can be said to be in the informal sector. In 1984, a census was made which permitted to identify 424,390 persons working in this field representing 25 per cent of the active population. As far as the artisanry is concerned, the surveys of 1978 and 1980 and the 1979 population and housing census have established that the artisanry represents a great opportunity of mass employment after the agriculture and trade.

Speaking about the integration of the informal sector in the planning process, the representative of Benin said that the various development plans of Benin were all project plans emphasising new investment because of the lack of a national system of planning based on the development objectives. The Government of Benin undertook positive direct actions for the informal sector alongside with the modern sectors. This was done through the grouping of 80 per cent of artisans into co-operation but such an organization faced several obstacles due to the diversity of small-scale activities, the dispersion of artisans having the same job, the instability of urban artisans, the absence of supporting and stimulating information. However, one should note that new small-scale business enterprises emerged. The Beninese co-operatives of agricultural inputs (Cooperative
beninoise du materiel agricole) of woodworks (Cooperative of furniture) of clothing (Tisserands) and of 'bakery. It should be noted that the co-operatives operate up to a certain level after which they are no longer in the informal sector.

The organization of small-scale trade is still difficult. Several attempts were made to organize it according to the products or according to certain modern structures. These actions are already made in different plans from the point of view of qualitative objectives aiming at the promotion of new forms of social organization of work.

The government undertook several direct actions of promoting the informal sector. As far as trade is concerned, the operating relationship between the structured trade and the structure of government is the state participation in the promotion of informal trade when a project is implemented in the formal trade sector. During the different plans, government has incorporated and implemented projects regarding the roofing of market, and other economic infrastructures which are the real factors in the promotion of the informal trade.

As far as the level of artisans is concerned, the last two plans paid attention to the promotion of artisanal sector. The subsequent projects which are being presently implemented are: (a) the workshop projects for pilot co-operatives which provide training and a demonstration effect for all the region; (b) the construction of a national center for the promotion of artisanal which also aimed at the training of local people and commercialization of products; (c) the project for the training of artisans which aimed at training 300 artisans in the co-operative management and organizing the training training abroad; and (d) the project for integrate development of Pehunco which aimed at promoting artisanal in the rural area through the creation of favourable and attractive environment and through the provision of agricultural credit.

The representative of Benin finally concluded that the planning in Benin deals with the informal sector through the development projects. When the national planning will embrace the macro-economic objectives more explicitly and when the problem of data, popularization, organization and knowledge of different processes of production will be solved, the informal sector in Benin would be fully integrated in multisectoral planning.

(b) The Experience of Senegal

The representative of Senegal presented a paper on "The integration of the informal sector in multisectoral planning: Case study of Senegal". The representative said that despite the dispersion of informal activities with a great number of services and small-scale enterprises coherent action should be taken for the better understanding of the informal sector. In Senegal, the economic and social policy which aims at assisting and promoting the informal sector was taken by the government so as to have a comprehensive understanding of the sector. The problems faced by Senegal, however, relate to the availability of reliable statistical data. Until recently, indeed, the informal sector was neglected in favour of the large-scale units of production. But given the saturation of the modern sector in terms of employment the rarity of external financing sources, the small and medium-scale enterprises are now given due consideration. This reversal of the trend towards the informal sector is well in line with the historical economic development of developed countries. Indeed, the informal sector in general and the handicraft sector in particular can ensure high employment and training opportunities for local entrepreneurs. In our developing countries, such as Senegal, greater attention to the informal sector
supported by the nationals would be useful given the externally oriented development of the modern sector especially its dependence on foreign capital.

(c) The Experience of Kenya

The representative of Kenya gave a summary of Kenya's experience in the informal sector. He indicated that the informal sector concept is not new in Kenya. Since the ILO report of 1972 on "Employment, incomes and inequality: A strategy for increasing productive employment in Kenya", the informal sector has received attention in Kenya's subsequent development plans. However, little is still known about the informal sector and much "experience" has yet to be gained in formally incorporating the sector which has, in the past, tended to suffer from a negative public image despite possessing many positive characteristics and its vital contribution to the economic growth of the country.

A number of national workshops aimed at providing more insight into the operation of the informal sector in Kenya have been conducted and the final report will soon be presented to the government. However, from the little that is already known about the sector and the factors that inhibit it, the Government has outlined a number of measures to be taken to mobilize the sector for national development. These are contained in the sessional paper No. 1 of 1986 on "Economic Management for Renewed Growth" and include the following:

(i) increasing in productivity and incomes to stimulate the demand for goods and services provided by the informal sector;

(ii) lowering of tariffs on raw materials, semi-processed goods and other intermediate inputs, with a bias towards those used widely by the informal sector;

(iii) expansion of access to credit facilities for informal sector businesses; dissemination of information on market opportunities and appropriate production methods for small-scale manufacturing; expansion of youth polytechnic training with a focus on appropriate skills and management techniques; and also relaxing current restrictions on informal sector activities.

A special task force is in the process of being formed to review all policies to promote the informal sector. The Ministry of Planning and National Development will establish a special Unit for small-scale enterprises to coordinate these efforts and give them their due emphasis in development planning and implementation, and also explore further options.

(d) The experience of Congo

The representative of the People's Republic of the Congo presented a paper on "The situation of the informal sector in Congo". He said that the informal sector is relatively less developed in Congo and that it was only recently that it had been taken into account in the State's planning process. This sector started to emerge only in the present decade and had attracted the attention of the public authorities.
However, the statistics reveal that in some branches, the part of the informal sector reached important proportions as far as production and employment are concerned. The contribution of the informal sector is mostly reflected in the solution of employment problems. The census made in the country shows that between 1974 and 1984 for example, the informal sector created more employment opportunities than the private sector and almost the same number of employees as in the public sector. Thanks to this active role of the sector, the urban unemployment did not reach dangerous proportions. What is important is that the informal sector had provided job opportunities to the low groups of the population - which, traditionally, found it difficult to be absorbed by the labour market (persons with low qualification, women, illiterate persons, handicapped persons, etc.).

However, the State policy of leaving informal sector operate was freely confronted by the undue pressures of the modern, private and public sector, which considered the informal sector as a serious competitor. The role of the State in this context is devoted to the rehabilitation of this sector and the improvement of the general economic environment so that all the informal sector's activities as well as structured activities could co-operate with perfect mutual interdependence.

1.7 Discussions on the Informal Sector

The representatives of countries asked questions regarding the definition of the informal sector and proposed other definitions that take into consideration their national realities. They pointed out that the "heterogeneity" of the informal sector and the non-availability of data regarding the informal sector are the main constraints to the applicability of the model proposed for the integration of the informal sector in the development planning of African countries. They made some reservations regarding the division of economy into four sectors such as proposed in the model presented. The representative of UNIDO reported that a model elaborated by his organization takes into account the informal sector at the level of different branches of the economy. He said that such a study is available for delegates who are interested.

In his reply, the representative of the ECA Secretariat pointed out that the existence of the informal sector results from the inadequacy of the African planning systems which do not take into consideration all the economies activities. The African countries which want to monitor the economic process should strengthen their statistical structures, implement the structure of popularization and determine the sectoral objectives and strategies that allow the integration of the informal sector in the development planning. This should be done through the strengthening of their planning machinery as recommended in the present study. It was important not to neglect more than 10 per cent of GDP and 40 to 60 per cent of the urban population. He indicated that the utilization of the classical sectoral classification for the informal activities as it is done by UNIDO is very judicious and leads to a more complex model. Therefore, due to lack of statistical data the proposed model which is very simple and can be solved would be desirable.
Topic 2: DYNAMIZATION OF INPUT-OUTPUT TECHNICAL COEFFICIENTS EXPERIMENTS IN LONG-TERM PROJECTIONS OF ECONOMIC GROWTH IN DEVELOPING AFRICAN COUNTRIES

2.1 "Input-output balance models complex" (Matlin I.S., Dr. of econ. Sciences CEMI AS USSR)

The author elaborated the different types of aggregated multi-sectoral models (i.e. semi-dynamic models with direct or reverse recursion, lag or non-lag dynamic models etc.). These models represent the most developed type of multi-sectoral models regarding the approaches to their characteristics and the analysis and the methods of the solutions. Their being quite compact and operating with easily available dataentry data made them widely applied. At present they are used for analytical regular plan and plan calculations. This forms the basis for their direct in built into the technological process of the perspective planning.

Since 1973 the semi-dynamic and later dynamic 18-branch models have been widely applied to the five-year long-term plans development. The experience of 1976-1980 plan projects construction together with the perspective plans till 1990 showed that the applied multi-sectoral models may be used not only as a means for the ready-made solutions but as an instrument of preparation, estimation and final quantitative realization of the hypotheses of the coordination of separate plan section projects. The different types of I-O models are based on one and the same initial data basis and are oriented at the solution of similar economic problems. The next theoretical and empirical step here will be the integration of the modifications of the models on the basis of the unified methodological, informational, programme and technical means. One of the possible variants of this integration is implemented in a dialogue-computer systems which was developed at the USSR State Planning Committee Computer Centre and the Central Economic and Mathematical Institute of the AS USSR. It was called CAM - the complex of multi-sectoral aggregated models.

2.2 "Utilization of inter-sectoral models in the practice of national economic planning". (Urinson Y.M., Prof., Dr. of economic sciences, Chief of Department - GOSPLAN USSR).

In the socialist planning the main method where by the resources and requirements are mutually coordinated and the necessary proportionality in the national economic development is ensured is the balance method. The report examined the opportunities to pass from the particular material balances to the inter-sectoral cost balance. Mathematical model gives an opportunity to use linear function for input and output. The report is concerned with the implementation of planning practices in the GOSPLAN of USSR short-term and long-term input-output balances models.

2.3 "Structure of complexes of related industries: A scheme for optimized planning". (Dr. Martynov C.V.)

One of the characteristic features of the economy in developed socialist society is the planned process of continuous improvement of the industrial branch structure. Progressive alterations in the branch structure promote scientific and technological progress, the efficiency of social production and the successful solution of the task of improving the people's well-being.
It is possible to single out a relatively small number of complexes (for instance the fuel and energy complex, the agro-industrial complex, construction forestry etc.) which are different in terms of the resources they use, the technological schemes and production processes they operate their final products and consumer orientation, ultimate production goals etc. Planning and management of the national economy viewed as a system of multi-industrial complexes will create a greater awareness of inter-branch ties. It will provide the grounds for explaining all the advantages offered by a planned economy and management system.

Economic complexes are put together with the industries which are closest related, reference is made of the ties between the industries that give an account of their unity of resource, complex consumption of raw materials and resources, satisfaction of identical or interchangeable final demands of society, continuity of technological processes, existence of related groups of production technologies, consumption, transportation and storage of produce etc. According to the territorial factor, economic complexes can be created either for the country as a whole or for its separate regions. Complexes of national importance should be geared to tackle the largest reproduction goals, socio-economic and environmental conditions for production, the agglomeration effect, etc.

The optimal approach to long-term planning in a complex of related industries should be accompanied by a system of economic-mathematical models whose fundamental principle of hierarchy of optimal calculations and the branch approach to choice of hierarchy level.

The system has two levels: the industry and the complex of industries. The models are connected and geared for succession correlation of decisions in the model system is carried out by every iterated calculations which provide the best approach towards the optimal plan.

2.4 "Medium-term multisectoral planning by using tables of input and output in physical units and in values". (Nikitina V.Z., Dr. of econo. science CEMI AS USSR)

In USSR a system of input-output tables and models is being developed which gives a better insight into the relation of resources in the national economy. The State Planning and Supply Committees have developed in addition to material input-output tables for the five-years plan, the plans of product allocation to basic fund-holders so as to ensure specificity of production and consumption in agency- and territory-wise. For every year covered by the plan extensive input - output tables representing physical units and values (IOTPVVs) were found necessary.

The research methodology was formulated in the IOTPVV model developed in Economic Research Institute of the State Planning Committee. The CEMI AS USSR is developing the procedures for compilation of IOTPVVs for the Union Republics and economic regions with a view to improving the comprehensiveness and balancing of these plans and making the territorial and sectoral aspects compatible at all level and stages of planning.
A unified IOPTPVW structure, a unified classification of products, sectors, ministries (departments) relatively simple input-output models comprehensible for any economist and a program package for processing large matrices and thus for computing a series of analytical activities by a non-programmer user make this tool applicable to various stages of analytical and planning computation on any level of the economic structure such as intersectoral complexes, economic regions, Union Republics and the entire country.

2.5 "Methods of drafting prospective input coefficients for inter-industry models". (Dr. A.V. Cherny, Dr. of economic sciences, Research Institute of Economics and Planning Committee of the USSR)

Developing of coefficients of inputs of productive resources - raw materials, labour, fixed assets and capital investments - is a major phase in drawing up a planned inter-industry balance, in particular the information held by the coefficients of direct inputs of objects of work such as aggregated input normatives of raw and other materials, semi-finished goods, fuel and energy per unit of production. Changes in the national economy constitute a major factor accounting for a reforming sectoral structure of social production and for the varying rates of growth of individual sectors and products.

The system of inter-industry models has been developed and experimentally approached in the Soviet Union inclusive of aggregated dynamic model of inter-industry balance and of physical cost-value inter-industry balance. It is designed to determine the rates of economic growth, its sectoral structural proceeding from various hypothetical patterns of society's final requirements and the assessment of longer-term trends in the changing efficiency of using the principal types of productive resources. The coefficients of direct material inputs used in aggregated dynamic inter-industry balances are drafted in cost-value terms and represent the input of one industry's gross product per one rables woth of the gross product of another industry. The general economic indicators are specified and detailed in physical cost-value inter industry balances: as the result, a mutually-balanced system of basic physical and cost-value indicators is shaped, related to the general economic indicators and proportions and to manufacturing and distribution of products in physical terms by industries, head government ministries and departments.

2.6 Dynamization of Input-Output Technical Coefficients: Experiment in long-term Projections of Economic Growth in Developing African Countries (Mr. E-Egaily M.O.)

A representative of ECA Secretariat introduced document ECA/PMM/2 entitled "The dynamization of input-output coefficients: experiences in long-term, projections of economic growth in developing African countries". In his introduction he emphasized the importance of the study as a contribution to the development of analytical tools for short-term forecasting models and at the same time to strengthen the capability of long-term perspective studies currently undertaken by ECA in some African countries. He briefly described the various methodological framework for updating input-output coefficients to enable African countries to make frequent updates of the input-output table before using it for any analytical purposes. He alluded to the multiplier method (rAs) as a suitable technique for this purpose as it requires minimal information such as an observed input-output table of an earlier reference period and control tools of
gross output, intermediate output and intermediate inputs of a future year. The method
was applied to update Mauritius input-output table of 1981 to 1984. The application was
mainly for illustrative purposes and the results only serve to provide a basis for further
improvement and investigation of the data base for the development of such analytical
techniques.

In the second part of the study, investment was explicitly introduced in the model
as a growth factor of crucial importance for the dynamization of the intersectoral
linkages. For this purpose, the dynamic input-output technique was illustrated as an
analytical tool for establishing planning and forecasting models to solve for problems
of resource allocations and policy design. He indicated that such planning policy models
constitute a major shift from sectoral analysis on a macro-level to a highly disaggregative
intersectoral linkages of the various parts of the economy. With this technique, planners
could investigate the effects on the output growth path arising from changes in the level
of final demand under various scenarios. The changes can be extrapolated and forecasted
using a growth elasticity approach or by imposing indicated or planned policy changes.
The model was applied within the framework of ECA economic modelling programme to Nigeria
as an illustrative example of a country with a growth factor such as oil.

2.7 UNIDO Presentation

The representative of UNIDO (Mr. Se-Hark Park) gave an account of the on-going work
in the field of modelling. He said that the evolution and the current status of UNIDO's
modelling work was composed of:

(a) Lima Development Objective (LIDO) model.
(b) UNIDO world industry co-operative model.
(c) IDIOM software package for the country simulation.
(d) UNITAD model.

UNIDO had also made an input-output analysis of linkages between industry and
services and their implications for employment generation. Using 27 country input-output
tables for different income groups from UNIDO data bank the paper analyzed and quantified
the nature and magnitude of linkages between various service activities and manufacturing
activities. For this purpose, the service sector is disaggregated into the four sub-
sectors: distributive services, producer services, personal services and social services.
The linkages between each of these service subsectors and various manufacturing industries
at different stages of development were established using the inter-sectoral dependency
ratios, intersectoral multiplier and income elasticity measures, and their implications
for employment generation were derived.

2.8 Country Papers

a) Experience of Algeria

The representative of Algeria (Mr. Abdoum Ramada) outlined the experience of his
country in the field of the long-term Planning and the role reserved to modelling. He said
that in Algeria account is put on incorporating the main socio-economic indicators in the
planning-process. Perspective techniques and forecasting models were used in a
comprehensive manner with the deglobalization of long-term objectives to a medium-term
period.
He said that the analytical approach consists of a long-term planning model which had to project macro-economic variables up to the year 2000. This analytical tool was initiated in the beginning of 1980s. In this model, the role of variables "investment" and "employment" was given a central role in defining the long-term objectives. In this context, the "integration of the economy" is particularly important in the definition of the function of long-term investment. From a technical point of view, an integral scheme describing the Algeria economy is given in the paper. This scheme is based on an anticipated illustration of the main objectives of the economy and on the methodology, of elaborate different projections of economic growth in the framework of iterative scheme of convergence.

Secondly, there was a summary of the modelization of the national economy taking place in the OCP (Organe Central de Planification) which was concerned with the elaboration of a short-term multisectoral forecasting model which is done annually. In this field, the model contains a number of sectoral definition and specification of equations and a recycling scheme of dynamization is used. Finally, he said that the macro-economic, multisectoral and dynamic models use the input-output tables and a global economic table in which the emphases is put on the productive sector.

b) Experience from Egypt

The representative of Egypt (Mr. Abdul Kadir) introduced the paper dealing mainly with some practical experiences and problems of working out and utilizing sectoral balances for the Egyptian economy as whole. The paper also deals with a brief review of planning models and related problems on the basis of Egyptian experience in investigating the methods of dealing with economic variables in planning (exogenous and endogenous), and to what extent they can be included in the multisectoral planning models. The paper tries also to give a quick evaluation of the uses of multisectoral models in development planning. In the second part, of the paper, the paper introduces an exercise of using multisectoral planning models in drafting and projecting the main economic variables in the Egyptian economy.

c) Experience of Tanzania

Mr. Reweymanu outlined the importance of the use of Input-output techniques in socio-economic planning in Tanzania.

Four input-output tables on Tanzanians (Mainland) economy have been prepared so far referring to the years 1954, 1961, 1969, 1970 and 1976. The 1976 Input-output table is comprehensive both in terms of sector coverage and disaggregation. As with the preceding tables, however, preparation of the 1976 input-output table was based on a weak data base.

Planning in Tanzania has until now not involved the use of input-output data or methodology, - be it for short-term, medium-term or long-term planning. The two long-term plans which have been drawn up have in the main been statements of socio-economic objectives as well as projections of macro-economic parameters, in particular GDP and sectoral growth. The medium and short term plan focus on three objectives at parameters as well as financial projections to realize them.
The use of input-output data for planning in Tanzania present circumstances can not be easy given the problem of getting adequate data in usable form as well as operational constants such as lack of facilities at menpowers.

In spite of these constraints, there is an increasing awareness that economic planning management could be more thorough than it is now and that input-output methodology could be of great help towards this end.

**Topic 3: THE TREATMENT OF PRICE AND BALANCE OF PAYMENT VARIABLES IN SHORT-TERM SAM BASED FORECASTING MODELS**

3.1 "Study and forecasting models of developing countries solvency"

(Dr. Gurevitch D.I. and Shatalov S.I., Institute of Africa AS USSR).

Solvency is a major macroeconomic feature whose evaluation and forecasting is collateral in one way or another to any analysis of a country's economic activity. It means a country's ability and preparedness to comply with its obligations in respect of its foreign partners. A changed solvency condition may be caused by a variety of factors, including the country's specific strategy of economic development, the phase of the cycle, market dynamics, the structure of foreign economic relations and even the home and international situation. In its turn, a country's solvency condition strongly affects not only its financial position, but also the living standard of its population, the social and political situation in the country and the class conflicts there.

Econometric methods and models enable a debtor country to make a full-pledged study and evaluation of own financial and economic position; it can help detect the major causes of insolvencies, and take timely measures to reduce their negative effects in the future. Knowing the creditor countries' methods and ways of evaluating the debtor country's solvency, the latter can foresee their reaction to its requests for credits.

Solvency analysis and forecasting have acquired a special meaning in the light of the fact that developing countries solvency in the eighties has tangibly weakened and become much less stable than 15-20 years ago. The 1930-1982 economic slump and the tough anti-inflationary policy of leading imperialist powers led to a mass debt crisis in the developing world. In 1981-1985 over 35 young states found themselves unable to honour their foreign debt obligations, whereas a still greater number had to sacrifices their economic growth to avoid defaulting.

The model suggested by the authors can be classified with regresional models. For this model, statistical data were prepared covering 32 African countries south of Sahara. In the course of testing and adjusting the model, over 20 variables were tried which are relevant to various factors of African countries' solvency both of global and internal or local nature. Many of them were found statistically valued. The authors research the classification of 32 countries according to these models and make a short time prognosis.
3.2 "Models of finance and value balancing of national economic turnover based on integrated economic information" (Dr. Detaeva A.V.)

The social product is reproduced in two forms: material physical and monetary value. This means that social product turnover is reflected in its value equivalent movement, and material-physical proportions formed between the production and use of the social product are matched by monetary-value preparations. The latter form is the distribution and redistribution of money incomes of participants of reproduction process.

The planned economy balance is achieved using the balance method of planning and finds its expression in the national economic balance (NEB). Our methodology makes it possible to see in the main NEB table characterizing the physical and financial aspects of reproduction into a unified balance system of integrated macroeconomic information designed for combined representation and analysis of the material-physical and finance-value aspects of reproduction and of their balance. The respective matrices are called "Coordinated physical-finance balance" (CMFB). The production of the gross social product is presented by types of produce and economy sectors (branches of the material sphere producing output), and the resources of the created national income and the used final product are broken down respectively into primary income elements and types of final costs.

The CMFB makes it possible to integrate indicators characterizing production and use of created product value in the material-physical form and creation, distribution, redistribution and use of national income value within the finance turnover between the main participants of the reproduction process - the finance turnover between the main participants of the reproduction process. The formulated task of national economic turnover balancing is mathematically and computationally contrivial. Its solution can be attempted using the following general algorithm:

1) the choice of the initial optimization point - basal CMFB, obtained through direct estimate using basal data on factor values;
2) the choice of a balancing direction out of the above mentioned ones, or of a combination of directions;
3) identification of balancing constraints;
4) search for the extremum;
5) direct estimate of the optimal CMFB using optimal factor values found in item 4.

There some finer methods using CMFB as the initial point. These are the task of optimization of the consolidated physical-and-finance balance, models of finance balance, models of finance-and-distribution balancing and also the models of value balancing. These models illustrate the main methods of instrumental balancing of the national economic turnover, i.e. its balancing without changing its physical base only by organizing a finance-value environment for its realisation through maximum use of balance efficiency of finance-and-value levers of national economic turnover.
3.3 "Regional economic models": (Prof. Albegov M.M. and Koltsov A.V. (CEMI AS of USSR)

In the Soviet Union the most wide-spread approaches to regional modelling are the composition and the decomposition approaches. The authors describe a decomposition as scheme as best suited for the profound analysis of the specifics of social and economic goals faced by separate regions.

Considerable experience has been accumulated in the Soviet Union and abroad in the construction of models of the econometric type at national and regional level. This experience has shown their possibilities for their practical implementation in pre-planning analysis of economic perspectives. Multifactor regression dependences, calculated with statistical methods, notably the least squares method are instrumental to the model. Balance ratios and identities are also used. The information base is composed of dynamic series of exogenic and endogenic coefficients which are used to define chosen dependences. The model is a dynamic one since it makes use of lagging variables, with lag not exceeding 3 years.

3.4 The Treatment of financial Prince and Balance of Payments Variables in short-term SAM-Based Forecasting Models: (Mr. Thisen J.K.)

In introducing this paper, the representative of the ECA Secretariat indicated that econometric forecasting models which try to trace and estimate the future outcome of the economy-wide system in general and business in particular are growing rapidly, in developing as well as developed countries. These econometric forecasting models are designed to help government policy makers devise fiscal and monetary policies that would promote stability and economic growth for their countries. However, the econometric models alone are not adequate for making accurate forecasts: expert judgement, time series, current data analysis and interactions among variables also play a role in the forecasting processes.

He informed the meeting that since 1978, the United Nations Economic Commission for Africa has been engaged in a series of programmes involving the building of planning models with the objective of mapping a future outlook for African economies. These models aim at helping the African countries in formulating economic strategies and policies within a coherent and consistent national development plan by indicating the policy implications under various alternative development scenarios. In 1980 the ECA completed the econometric models which were presented to the first Joint Conference of African Planners, Statisticians and Demographers which made various recommendations regarding the extension of the models to cover multisectoral analysis and to supplement the macro and long-term models by short-term forecasting models. Pursuant to this recommendation, the ECA Secretariat made a second study on sectoral output and employment projections which was submitted to second session of the Joint Conference of African Planners, Statisticians and Demographers in 1982. Among the various suggestions made by this conference was the need to supplement the long-term models by short-term forecasting models.

In this context, the ECA Secretariat devised the Social Accounting Matrix approach for short-term forecasting. This approach is being applied on a number of African countries. The selected countries are: Egypt and Sudan in North Africa, Côte d'Ivoire and Nigeria in West Africa, Zaire, Cameroon and Rwanda in Central Africa, Ethiopia, Kenya, Mauritius and Zimbabwe in Eastern and Southern Africa. However, the system was implemented in some countries, namely Rwanda and Mauritius.
The approach underlying the construction of Social Accounting Matrix for developing countries is to devise and implement a framework of accounts which conforms to two principles, namely (a) the framework must be comprehensive and internally consistent in order to support and monitor development planning at the economy-wide level and (b) the emphasis should be put on the distributional objectives of the development policy within the existing economic data system. The Social Accounting Matrix (SAM) whose format varies according to the socio-economic structure of each individual country and the availability of data involves in general two types of accounts: the current accounts of commodity production, labour and productive capital, private and public sectors, workers abroad and the rest of world, and the capital account of the institutions and the rest of the world. Within this SAM-based short-term forecasting system, it was found necessary to focus on the treatment of financial price and balance-of-payment variables as these are very pertinent for short-term fluctuations in the economy.

It is within this capital account that financial variables can be introduced to reflect the financial transactions on the capital account, such as borrowing and lending. Such activities are very important for developing economies which are faced with an acute shortage of savings to finance investment. Because of the low level of incomes, private individuals or corporations and governments in developing countries can rarely finance their investment from current surpluses, implying that they must borrow from the domestic money and capital markets or from abroad. Such a liability automatically creates a corresponding asset and the account must balance. The integration of the financial variables is made at two levels: first, in the capital accounts, the institutions are classified into households, non-financial enterprises or corporations, governments, and banks and the other financial institutions. Secondly, the financial account is added with four items: domestic currency banks and other deposits, bank advances and others, domestic borrowing, foreign borrowing and banks reserves.

As far as price variables are concerned, the price formulation was based on the analysis of the cost structure of production which was found more suitable given the level of data situation for explaining the changes in the sectoral price levels in developing countries. The treatment of price include the likely changes that might occur in the wage structure, the movement of the interest rates, the profit realization and the exchange rate fluctuations which were found more realistic for the analysis for price changes that occur in the short-term. The most difficult obstacles in developing African countries in adopting such a sectoral price formulation stems from the non-existence or poor quality of sectoral price indices. Therefore, African planners and statisticians may wish to devote considerable efforts in collecting appropriate sectoral price data.

As far as balance-of-payment are concerned, it was argued in the paper that although these variables have already been included in the SAM format, there are others which needed special attention, namely the current and capital transfers, short-term, medium- and long-term private and government debts which countries had contracted to implement their various development plans.

He concluded that for a broad understanding of the work of the economy as a whole, it is essential that African countries should demonstrate the incorporation of the SAM in their planning framework. The short-term demand forecasting aspect of the model is an essential base for the estimation of the feasible medium-; long-term development patterns of the economies.
3.5 UNCTAD Presentation

The UNCTAD representative briefly described his organization experience in the field of macro-economic long-, medium- and short-term modelling of the dynamics of the economics of developing countries. He presented, in general terms, the System for Integrated Global Modelling Analysis (SIGMA), which is now under elaboration by the UNCTAD secretariat.

Special attention was paid to the methodological aspects of the construction of the standard "country-model" and the treatment of external variables within the framework of the system. He outlined the projection of balance of payments variables and the future development of the system. Some concrete "country-models" of African countries, namely Kenya, Morocco, Cameroon were presented with the explanation of methodology used and statistical parameters used.

The system consists of fifteen regional sub-models, inter-linked by the models of international trade, prices and financial flows. In the framework of the system simulation and projection for different developing countries, including 12 countries of the African region, were made. The results of such projections are presented in the form of short-term world economic outlook which, since 1981, is published each year in the "Trade and Development Report".

3.6 DIESA Presentation

The representative from DIESA presented a brief survey of the work on modelling in projection and forecasting and made available to participants three DIESA documents relevant to the subject of the workshop. The Global economic analysis and projections of the UN Secretariat provide a perspective view or the external economic environment which the developing countries need to formulate their individual development programmes, and a basis for seeking consistency among the various projections made by the regional commissions and the specialized agencies.

The Global Econometric Model; (GEM), consisting of individual TWO-GAP country models of 13 countries was used by the UN Secretariat in long-term projection (5 to 20 years) which inter-alia served as a basis for setting the growth targets of the United Nations International Development Strategies for the 1970s and the 1980s. The model, which is maintained up-to-date, is being in socio-economic analysis used, including (1) estimation of the capital requirements for accelerated growth of developing countries, (2) measurement of expenditure levels required to attain literacy and health targets and (3) possible changes in the distribution of income as development proceeds.

Several multisectoral models built in the UN were briefly described. The Global Input-Output Model (GIOM) developed by Professor Leontief and associates, consisting of 365 sectors and 15 regions, was used for projections to the year 2000 but could not be maintained because of lack of financial resources. Recently, two dynamic optimisation models were developed in co-operation with the Institute of Economics and Industrial Engineering of the Liberian Branch (Novosibirsk) of the USSR Academy of Sciences by a team headed by A.G. Granberg with A.C. Rubinstein as principal investigator. The models and results are discussed in a forthcoming report of the project. Although these models allow for a greater number of economic variables to be determined endogenously, including
calculation of the so-called "dual" prices, they pose a much greater demand for input data and tend to yield extreme solutions that are not feasible in the real world, explicit quantitative constraints have to be introduced in order to avoid such solutions.

DIESA has also been an active participant in Project LINK an international, non-governmental project that integrates independently developed national economic models into a system that makes short and medium-term global forecasts and scenario projections. The national models are built and maintained by local economists familiar with national institutional and behavioral characteristics and domestic economic policy. The econometric models in the LINK system covers almost all of the developed economics, about 40 individual developing countries and 7 regional models that represent the other developing countries. Africa is presently covered by eleven country models (Africa: Gabon, Libya, Nigeria, Egypt, Ethiopia, Ghana, Kenya, Morocco, Sudan and Tunisia) and by two subregional groups (other least developed, and other). A recent scenario from the LINK system shows that if defense spending of industrial countries were to be cut back so as to achieve the ODA target of 0.7 per cent of GDP, the GDP of developing Africa (excluding OPEC members and Egypt) would increase an additional 8.5 per cent by 1990, while the average gain for the other developing countries would be only 1.7 per cent.

Econometric models of 17 African countries (Cameroon, Ethiopia, Gabon, Ghana, Côte d'Ivoir, Kenya, Madagascar, Morocco, Sénégal, Sierra Leone, Somalia, Sudan, Tanzania, Tunisia, Uganda, Zaire and Zimbabwe) were recently estimated for use in Project LINK. The model analyses the movements of macro-economic aggregates in real and nominal terms and project trends in prices, monitory phenomena, the balance of payments and external liabilities. The response of 10 African economies to change in 6 variables representing major domestic policy instruments and external factors were studied with the models: (1) a currency devaluating, (2) a decrease in government expenditure, (3) an increase net transfer payments from abroad, (4) an increase in world demand, (5) an increase in commercial loans, and (6) an increase in primary commodity prices. The results of the stimulation experiments confirm that, for these small open economies under a fixed exchange regime, policy changes can have highly significant and distinct effects on their macro-economic situation. The models also indicated the existence of trade-offs and establish quantitative guidelines for policy decisions.

In concluding, the DIESA representative observed that the Secretariat's experience in global and national modelling, particularly for African countries, is extensive and ample scope existed for intensifying cooperation with the ECA Secretariat on these matters. In particular, he suggested exploring the possibility of establishing joint teams of ECA, DIESA and UNCTAD Secretariats to assist African countries in refining their quantitative tools of policy analysis.

3.7 Country Papers on Treatment of Price and Balance-of-Payments variable

a) Experience of Mauritius

The Mauritius representative informed the Workshop of the progress made in the compilation of a SAM for Mauritius and in the elaboration of a short-term SAM-based forecasting model. He said that the cell of the SAM for 1981 have already been filled and the model is ready. It has not, however, been possible to install the model on the
computer at the Ministry of Economic Planning and Development because of the unavailability of a Fortran Compiler. He then highlighted the disaggregated SAM and the different blocks of the model with special emphasis on the pricing and balance-of-payments blocks. Mention was also made of the problems encountered, mainly those associated with data disaggregation, timing of economic activities, calculation of margins, trained manpower and other institutional factors.

He also referred to the question that raised as to the need and relevance of sophisticated models for small island economies like Mauritius. Appropriate models have to be worked out for individual countries taking into account the specific conditions of these countries. The SAM in this sense appears appropriate since it lends itself to disaggregation according to the needs of the planner e.g. the disaggregation of the Rest of World account by source of finance may be used to monitor the debt situation.

Work on the SAM is therefore moving at a satisfactory pace. The model will most probably be installed in Mauritius next year. In the meantime, the Ministry of Economic Planning and Development is preparing a document on the SAM for Mauritius so that the institutions and the public in general may become aware of the potential for analysis offered by a SAM.

b) Experience of Rwanda

The representative of Rwanda presented the macro-economic model called "UMUGANDA" which is seen in the country as a technically efficient tool for management short-term forecasting that has been implemented in the Ministry of Finance and Economy, to prepare and facilitate the economic decision-making process. The model tries to analyse the existing relationship between various sectors of the national economy. It is an input-output model in the sense that it allows to analyse the Leontief hypothesis according to which the inputs and outputs in volume terms are related by a linear relationship and that the relationship between the intermediate consumption and the total production is constant. This is true only in a short-term analysis.

The role of Prices in this model was basically that of a common denominator of the input-output elements. It was to be noted that certain elements of input-output, such as the taxes and profits do not correspond to each other; they are only expressed in monetary units. The fact that prices are not constant in the medium- and long-term will introduce distortions in the model if they are not treated separately. That is why the treatment of prices is important, not only to take into consideration this problem, but also and mainly to study the fluctuations of prices and the causes of such a fluctuation. However, even though theoretically a price can be linked to each element of input-output, the lack of sufficiently detailed and up-dated statistics show that most of the studies use, the price deflator for all the output of the different sectors. Thanks to the technical coefficients, it was possible to link the level of production and the prices of input-output and isolate the effects of price changes.

Speaking about the variation of price in the Umuganda model, he said that in its present formulation, the model does not explicitly integrate prices. However, the input-output table allows to follow the effects of sectoral price fluctuations (including wages, salaries and indirect taxes) on the costs and sale prices in other branches of economic
activities. Thus, theoretically any fluctuation in the wage level or taxes, import prices, custom duties will influence the price. This supposes an implicit assumption that any exogenous changes of one or several sectoral prices will have effective and integral effects on the new levels of other sectoral prices. The effect of an eventual substitution in prices has not yet been taken into account. This will require additional research in the behavioral patterns of consumers and enterprises, faced by an augmentation of prices of final consumption and inputs.

With regard to the treatment of the balance of payments variables in the Umuganda model, a model of balance of payments classified in accordance with National Bank of Rwanda nomenclature and with that of IMF was explicitly introduced in the model. However, there is a persistent problem grouping factor services with factor service. These two services are being separated into two categories in one of the scenarios. The balance of payments module also establishes a recapitulative account regarding the main data of foreign trade. It should be noted that the treatment of balance of payments is based on the exogenous data. The exogenous variables have not yet been taken into account in the Umuganda model.

3.8 Discussion on the treatment of prices and balance of payment variables.

In the discussions that followed, participants raised the question as to what extent short-term forecasting models take into account the problems of underutilization of capacity which is rampant in several African economies at the present time and to what extent the loans that are given could be efficiently utilized to solve this problems of capacity utilization.

The representatives of DIESA commended the ECA work on short-term forecasting models using the SAM approach particularly at a time when African countries were facing many short-term problems of balance-of-payment, debt burden, natural disasters (drought, desertification and inundations) and socio-economic crisis. He stressed that presently the work activities of various international institutions like World Bank, IMF and DIESA are being oriented towards solving short-term problems and away from long-term perspective studies of the 1960s and the 1970s. Collaborations between UNECA and DIESA in the field of short-term forecasting is therefore very pertinent.

The representative of UNCTAD commended the work done by the ECA Secretariat particularly the efforts made to include the balance-of-payment variables in the short-term forecasting models. He said that this work falls within the realm of what UNCTAD is presently doing for developing countries particularly in the field of foreign trade. He asked for clarification of some equations involving balance-of-payments to ensure compatibility of assumptions by institutions such as the UNCTAD and World Bank, particularly with regard to imports c.i.f. and exports f.o.b.

In response to the comments of participants, the representative of the ECA Secretariat said that the problem of underutilization capacity is very pertinent for African developing economies but this problem is more of a structural, long-term nature than short-term nature and, therefore, this issue should be treated within a specific sectoral model from the supply side. However, this question will be taken into consideration when elaborating forecasting model for countries faced with under-capacity utilization constraints. He thanks the representatives of DIESA and UNCTAD for their pertinent comments.
4.1 "Analysis and Modelling of Energy State of Africa" (Dr. Shovtsova V.E. (CEMI AS USSR))

The report deals with the methodology of energy situation in Africa. The major problems are identified to include: analysis of the investigated field; modelling of the investigated object, that is of oil and gas producing African countries, the performances of the balance of the interregional distribution of global energy resources, and general scheme of modelling of energy situation in Africa. Structural coefficients and the main elements of balance table enable the clarification of the role and place of a certain African country in international division of labour, and in world energy situation.

4.2 "Elaborate Modelling of the Energy Sector for Improved Energy Balance in Africa". (Mr. Bugembe P.K.)

In presenting the paper entitled "Elaborate Modelling of the Energy Sector for Improved Energy Balance in Africa", the representative of the EGA first noted the Central position of energy in the process of production and for consumption. Energy was needed in agriculture, industry, transport, construction and services. He noted that, at the present time energy questions were not seen as critical as in the 1970s after the sharp increase in oil prices. This was partly due to the recent decline in oil prices and the emergence of very critical areas in African countries such as food shortages, debt problems and chronic balance of payment difficulties.

It was however, emphasized that Africa had a serious energy problem characterized by (a) foreign exchange shortage to import energy, (b) the desertification resulting from massive deforestation due to extensive use of fuelwood, (c) inefficiency in energy utilization, and (d) unexploited energy resources.

With regards to foreign exchange shortages, the ECA representative pointed out that despite the decline in oil imports, many African countries will still face problems to cover their imports of oil. This was because of the slow growth in exports, the low commodity prices and the heavy debt servicing burden. Further, although many African oil-import levels, the rehabilitation and revitalization of the African economies will need more oil imports.

As regards the problem of the deforestation caused by fuelwood use, the ECA representative emphasized the fact that this was very serious. If not only threatened to desertify many African countries but would also result into an increasing shortage of energy sources for rural people. Further, extensive deforestation also affected agriculture as it results in serious soil degradation.
4.3 Country papers on elaborate modelling of the energy sector

a) The Energy sector in Burundi

Representative of Burundi treated the experience of his country implementation of the model called "Energy". For application of this model to intersectoral planning system were elaborated the submodels "Fuel" and "Electricity". Submodel "Fuel" deals with forecasting of five types of imported fuel, non considering local production of petroleum products.

Submodel "Electricity" makes possible the forecast of demand and supply of electricity. Local supply is determined by realisation of urban and rural project of electrification. Difference between the demand and supply covered by import.

I. FUEL

Up to 1931 fuel import was estimated by the function of proportion between the volume of importation and Gross Enterion Product of the secondary sector. The elasticity coefficient is very high between 1.4 and 1.6 - and the use of petrol prices, that's why it's necessary make more refined the analysis of future import.

There are five categories of fuel that is:
1. Benzin
2. Fuel oil
3. Gas oil
4. Clear petrol
5. Other petrol production.

Forecast of demand on energy type of fuel is connected with the consumption of the big industrial enterprises. The consumption of gas and oil depends also of the investments into the route construction. The most big part of imported fuel is consumed by three sectors: textile complex, tea production and beer. For calculation of provisioned import it's necessary to apply indices of production of beer and textile.

Consumption of clear petrol coinsides with the growth of population. Other petrol products consist of hydrocarbure gas and asphalts. In the forecast their consumption growth is considered to be constant during a year.

II. ELECTRICITY

In this model are distinguished electricity consumption in Bujumbra (capital of the country and the consumption of other provinces). What about the consumption of Bujumbra there are two groups of electricity consumption:

- by the government,
- by particular consumption.

The demand of Bujumbra is approximated by the equation of regression with Gross Domestic Product, Gross commercial internal product, Gross Domestic Product of secondary sector, and Gross Domestic Product of Public Sector.
There are also three stochastic relations. For some other categories of demand it's supposed to use seven years tendencies.

In other provinces is made a distinction between an energy produced by electrique groups and by hydroelectrique allocated in Burundi.

4.4 Discussions on Elaborate Modelling of the Energy Sector

In the discussion of the paper, participants emphasized the perverted nature of the energy problem in Africa involving on one hand very low levels of energy consumption and on the other hand high energy import burdens. A participant felt that the energy problem was likely to worsen before it improves. However, in systematically analysing the magnitude of the problem it was necessary to make projections of both the demand and supply along with the investments required. For this, the model proposed by ECA needed to be expanded. Also in estimating demand, particular attention had to be paid to the various strategies that African countries will adopt. Different development strategies in areas like industrialization would entail different energy demand levels. A question was also raised regarding the assessment of how the model would perform in African countries. It was also suggested that it was necessary to analyse all factors including population which affect the demand of energy. Finally, a clarification was sought as to how the high prices of oil had actually influenced demand for oil in Africa.

In answer to the various questions raised, the ECA representative noted that the energy problem in Africa was indeed perverted. For this very reason, it was necessary to analyse the problem in depth. The system that was being proposed was the beginning in his direction. As regards the performance of the model, the ECA representative pointed to the example that had been given in the paper which illustrated the various scenarios that could be analysed. For the effect of oil prices on energy demand in Africa, the ECA representative informed the meeting that many African oil-importing countries had reduced their oil import levels. In some cases, the levels were so depressed that even production activities were adversely affected.

Topic 5: Economic Cooperation between USSR and African Countries.

5.1 State and Perspectives of Economic and Scientific Cooperation between USSR and African Countries. (Prof. Tchetvertakov W.A., Expert in the State Committee of the USSR for Foreign Economic Relations).

In report is described the cooperation of USSR and African countries. The Soviet Government pays a great attention to the perspectives of cooperation with the African countries. Long term agreement is achieved between the USSR and such African countries as Angola, Ethiopia, Congo, Tunis, Morocco and some others. Nearly 22 thousands of African students are instructed in USSR.

With the help of USSR there are constructed 1500 schools and higher schools in Africa. The 13th Session of UN declared that the help to African countries is the state policy of Soviet Union.
Financial help is offered by USSR under the conditions that are profitable to African countries. Though the needed help for African countries is 150 billions of dollars.

Professor Tchetvertakov W.A. described some projects of growth of cooperation in the construction of enterprises of the full cycle providing modern technological processes.

On the topic the representative of ECA Mr. El-Egaily outlined the long standing economic and technical cooperation between the Government of the Union of Soviet Socialist Republics and the United Nations Economic Commission for Africa. He pointed out that the cooperation covers a wide spectrum of activities of crucial importance to the development of the African region, in particular the training of Africans specialists in the field of natural resources development, manpower planning, transport, industry and trade. He expressed his gratitude that the cooperation this time extended to a very important area of training African specialists in the field of economic development planning and in particular the opportunity of working together with a highly renowned Institute of Economic and Mathematical Studies of the USSR Academy of Sciences. He expressed his hopes that this cooperation with the Institute and similar bodies in the USSR will grow and expand at all levels.

The representative of ECA emphasized the need to strengthen the cooperation in two specific areas of significant importance for the development of the African region. Efforts should be made to explore in more details ways and means of making these areas fully realized in the near future in terms of financial and technical resources. These two areas, relate further to the development of the Social Accounting Matrix based short-term forecasting system which had been established in some African countries but were constrained by the shortages of resources both at the secretariat and the national level. The second area relates to regional planning of which the USSR has considerable experience. This area is of paramount importance for the successful realization and establishment of the African Economic Community as stipulated in the Final Act of Lagos.

Finally, the ECA Representative stated that he had no doubt that the considerable experience that the USSR has can be of tremendous value to the developing African countries and that every effort has to be made to strengthen and expand such cooperation.

Topic 6: STUDY TOUR

The meeting was also taken to a study tour at Riga in the Republic of Latvia. During this study tour the participants visited the State Economic Institute of the Academy Sciences of the Latvian Republic and the Scientific Research Institute of Latvian Republic state planning Committee. The participants were introduced to a number of models that are being utilized. These included in particular an agricultural model and an integrated input-output regional system. A demonstration of the working of the system on the computer was also made. At the end of the visit to Riga, participants visited Urmala town for sightseeing.

Mr. Nouna on behalf of delegates thanked the USSR authorities for this hospitality and the excellent manner in which the workshop was organized.
RECOMMENDATIONS OF THE WORKSHOP

Topic I: Integration of Informal Sector in Multi-Sectoral Planning

In view of the important and increasing role played by the informal sector in areas of employment promotion, income earning opportunities, skill acquisition, and the provision of basic needs in African economies, it is recommended that:

1. Governments take positive measures to integrate the informal sector in their macro-planning processes. To achieve this objective it is recommended that the governments:
   
   (a) give measures to correct the existing negative image;
   (b) organize workshops at national level to provide a forum for exchange of ideas among policy-makers, researchers, and the public;
   (c) increase data collection on the informal sector and update existing information;
   (d) identify areas where the sector is already making significant contribution and initiate appropriate programmes of assistance;
   (e) evolve measures which take into account the peculiar nature of the sector so as to enhance its contribution to national development.

2. African ministers of Planning and National Development give the ECA in collaboration with other international agencies a mandate to:

   (a) increase their activities in the informal sector especially in the area of macro-economic integration;
   (b) carry out research, data collection, and analysis of the sector;
   (c) organize a round - table/seminar of African Planners on the informal sector.

Topic II: Recommendations on SAM-based Short-Term Forecasting Models.

Given the fact that today, the developing African countries face greater uncertainties due to exogenous shocks (namely fluctuations of commodity prices, climate conditions, etc) and that there is a felt need to devise and implement short-term forecasting models which could enable African planners to analyse and monitor the evolution of their respective economies and make the necessary timely adjustments, the seminar recommend that:

1) The ECA Secretariat should strengthen and expand its activities on short-term forecasting models to include as many African countries as possible, taking into account the specific characteristics of each individual country and integrating the various financial, price and balance-of-payment variables which are pertinent to short-term forecasting.
2) The ECA Secretariat in collaboration with other specialized international organizations should help African countries organize their data system into the Social Accounting Matrix (SAM) which is regarded as a powerful tool for economic analysis and forecasting at both micro and macro levels and those relating to intersectoral balances (input-output technical coefficients and their dynamization). In this connection, assistance should be given to African countries for:

a) installing adequate, reliable, appropriate statistical data bases;
b) providing computer facilities through bilateral and multilateral arrangements;
c) training the local personnel in maintaining the short-term forecasting models through sending consultants for on-job-training or providing fellowship for training at ECA or abroad;
d) establishing a short-term forecasting unit at the Ministries/Departments of planning as an institutional follow-up machinery;
e) obtaining information on the experience of other countries of SAM-based modelling;
f) integrating African countries' models into the on-going World Project Link.

3) African countries should conduct as many independent surveys as possible to assure internal consistency in their short- and medium term development plans. These should include, inter-alia, household surveys, industrial census, population surveys, price, financial and foreign trade data surveys, etc.

Topic III. Energy Modelling

The participants:

Considering the importance of the sectors of transport and energy for the harmonizing and accelerate development of African countries;

Conscious of the fact that the costs of energy are relatively high thus making the costs of transport very expensive, for African countries in general and for the African land-locked countries in particular;

Also conscious of the necessity to improve the managerial of available energy resources as well as the investments in transport;

Considering the high cost of transport and energy in the developing countries:-

1) Recommend to African countries:

a) to collect as much data as possible as to construct the necessary models incorporating with energy and transport sectors;
b) to consider energy planning as an integral part of their economic and social development planning;
c) to exploit renewable source of energy;

d) to draw up and implement afforestation and reforestation programme so as to ensure continued availability of firewood in the rural areas and arrest the trend of rapid environmental degradation resulting from deforestation;

e) to enhance co-operation in energy issues both on a bilateral basis as well as through regional groupings such as SADCC, ECOMAS, PTA, etc. and to ensure conservation of energy.

2) request the UNECA and the Academy of Sciences of USSR:

a) to assist the African countries willing to introduce a sub-model on energy and/or transport in the existing models or do create one by sending to African countries experts and the necessary equipments;

b) to provide technical and material assistance with regard to (computer programming and the treatment of statistics on energy and/or transport)

Topic IV: Recommendation on Regional and Sectoral Planning

Taking note of the importance in Africa of overall planning enhanced by coherent and efficient regional planning,

Conscious of the necessity to coordinate the sectoral policies for better articulation of the economies of African countries,

The seminar participants recommended with respect to multisectoral planning the following:

1) to implement, progressively, a system of information and regional statistics;

2) to take into consideration, as the case may be, the regional aspect in the construction of medium and long-term national plans;

3) to create regional structures of planning and to give to the existing ones the appropriate means in modelling;

4) to establish appropriate machineries for the decentralization of mechanisms of management and planning;

5) to construct simple economic models which can show the impact of the integration of African countries in such areas as trade and transport;

6) to increase ECA technical assistance to African countries for the preparation of development plans.
**Topic V: Recommendation on the Cooperation in the field of Planning Models and macro-economic Management.**

The workshop:

Noting the various levels of development in model building in the ECA member countries;

Considering that exchanging information and experiences is always enriching;

Considering the possibilities of collaboration which exist on the one hand between specialized, international and governmental agencies;

Considering finally that from now on and more than in the past, the national planning and management of the national economy will become more and more inseparable with the utilization of planning models and macro-economic managements;

- Recommend:-

1) the intensification of cooperation in the field of modelling between all the members of ECA including the organizing between them of a system of exchanging of information and experience on the one hand and, on the other hand between these countries and the ECA. In this regard, ECA should undertake and encourage these forms of cooperation;

2) the development of such cooperation between the African countries and ECA, on the one hand, and the specialized international and governmental organizations more experience and competence are of the nature to promote the modelling method of planning and in macro-economic management;

3) the fostering of scientific meetings for the promotion and development of modelling in the African countries: to do this, ECA should explore all the possibilities and benefit from the experience of USSR, in particular the experience of the Central Economics and Mathematical Institute of the USSR Academy of Sciences and similar bodies in USSR.
Seminar on Multisectoral Planning Models and short-term Economic Forecasting for Policy Design in Development Planning and Management in African Countries

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