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INTERNATIONAL ASSOCIATION  
FOR RESEARCH  
IN INCOME AND WEALTH

UNITED NATIONS  
ECONOMIC COMMISSION  
FOR AFRICA

PROCEEDINGS  
OF THE I.A.R.I.W. - C.E.A.  
AFRICAN REGIONAL CONFERENCE

DOUALA, NOVEMBER, 15-20, 1982

VOLUME I

PARIS, JULY 1983

INSTITUT NATIONAL  
DE LA STATISTIQUE  
ET DES ETUDES ECONOMIQUES

MINISTERE DES  
RELATIONS EXTERIEURES  
COOPERATION ET DEVELOPPEMENT

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\* La Session 5 consacrée aux aspects informatiques de la Comptabilité Nationale n'a pu être assurée et a donc été supprimée.

*Session 5 devoted to data processing aspects of National Accounts could not be held and was therefore cancelled.*



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COMITE DE PROGRAMME DE LA CONFERENCE  
I.A.R.I.W./E.C.A.  
DE DOUALA (Novembre 1982)

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Président :

M. Oleg ARKHIPOFF, I.N.S.E.E., Paris

Membres :

- M. R.M. ALLEN, Overseas Development Administration,  
Londres
- Mlle Marie-France FABRE et Mme Martine BLATIN, Services  
de la coopération et du Développement, Relations  
Extérieures, Paris
- M. Jean NKUETE, Banque de Paris et des Pays-Bas, Douala
- M. P.M. REES, Londres
- M. Parmeet SINGH, Commonwealth Secretariat, Londres

## COMPTE RENDU D'ENSEMBLE

Les travaux de comptabilité nationale en Afrique, après avoir connu un essor indéniable, ont marqué ces dernières années un certain essoufflement, dans certains pays du moins. Plusieurs raisons à cet état de fait peuvent être avancées. En particulier, on peut évoquer un certain manque de continuité dans les encadrements techniques nationaux, tenant à une rotation trop rapide des cadres expérimentés au sein des administrations africaines. On peut également remarquer une absence de concertation et de confrontation des expériences nationales, parmi les comptables nationaux des différents pays africains, lacunes s'expliquant par l'inexistence d'un lien permanent de rencontre inter-africaine, spécifique à la comptabilité nationale.

Aussi, l'International Association for Research in Income and Wealth avec la collaboration de la Commission Economique pour l'Afrique des Nations-Unies a pensé que l'organisation d'une Conférence régionale en Afrique, consacrée à ces problèmes permettrait certainement de débloquer une situation peu satisfaisante.

A cet effet, donc, l'I.A.R.I.W. et la C.E.A. ont choisi d'organiser une Conférence du 15 au 20 Novembre 1982, au Cameroun, pays qui est un trait d'union entre l'Afrique "Anglophone" et l'Afrique "Francophone".

Grâce à l'obligeance du Gouvernement camerounais et, plus précisément, du Ministère de l'Economie et du Plan, qui a bien voulu assumer la charge matérielle de la Conférence, cette grande rencontre inter-africaine s'est déroulée à Douala, en novembre 1982 comme prévu (le lieu initial de la Conférence, Yaoundé, a dû être reporté à Douala, pour des raisons purement techniques).

Grâce à l'aide apportée par la Direction de la Statistique et de la Comptabilité Nationale du Ministère de l'Economie et du Plan à Yaoundé, par le Ministère des Relations Extérieures Français, les Services de la Coopération et du Développement Français, par l'International Development Research Center Canadien, par la Banque Mondiale, l'Institut National de la Statistique et des Etudes Economiques (I.N.S.E.E., Paris), et le Centre Européen de Formation des Statisticiens Economistes des Pays en Voie de Développement (C.E.S.D.), la participation à la Conférence a été très suivie et les sessions se sont déroulées dans les meilleures conditions de travail.

En effet, 79 participants ont pu être enregistrés : 17 venant d'Europe (dont 2 délégués de l'O.S.C.E. de Luxembourg), 6 d'organisations internationales ou régionales (1 délégué de l'U.D.E.A.C., 2 de la B.I.R.D. et 2 de la C.E.A.), 21 délégués du Cameroun, 22 d'Afrique "Francophone" (Madagascar, Niger, Bénin, C.A.R., Côte d'Ivoire, Guinée, Tunisie, Mauritanie, Mali, Togo, Sénégal, Congo, Gabon, Haute-Volta et Rwanda) et 13 d'Afrique "Anglophone" (Nigéria, Tanzanie, Lesotho, Malawi, Botswana, Kenya, Ouganda, Gambie et Ethiopie), (voir Annexe 2).

Le programme de la Conférence ayant été conçu de façon très ouverte (voir annexe 1) pour permettre de mieux cerner les questions préoccupant actuellement les comptables nationaux africains, un grand nombre de communications, très diversifiées, a pu être examiné pendant les sessions. Et des discussions approfondies se sont amorcées, lors de chaque session, sur les thèmes présentés. L'intégralité des communications fait l'objet de la présente publication des Actes de la Conférence.

Devant le succès de cette rencontre de Douala, plusieurs participants ont émis le vœu de voir se renouveler de façon périodique (4-5 ans) ce type de conférence.

Oleg ARKHIPOFF  
Président  
du Comité de Programme

# OVERALL REPORT

Work on national accounts in Africa, after a period of indisputable progress, have somewhat allowed down in the past few years, at least in some countries. Several reasons can be put forward to explain this state of affairs. In particular, one can mention some lack in continuity of the national technical managerial staff, owing to a quick turnover of experienced executive staff within the African administrations. One can also observed a lack of discussion and sharing of national experiences between national accountants from the various countries ; the non-existence of a permanent link of inter-African meetings, specific to national accounts explains such lacunae.

The International Association for Research in Income and Wealth, with the help of the UN Economic Commission for Africa has thus deemed that the organization of a regional Conference, devoted to such problems could certainly help to resolve this unsatisfactory situation.

The I.A.R.I.W. and the E.C.A. have therefore decided to organize a Conference from November, 15 to 20 1982 in Cameroun, a country which serves as a link between "Anglophone" Africa and "Francophone" Africa.

Thanks to the help of the Government of Cameroun and, more precisely, the Ministère de l'Economie et du Plan, which was willing to undertake the actual organization of the Conference, this large inter-African meeting was held in Douala, in November 1982 as expected (the original location of the Conference, Yaounde, had to be shifted to Douala for purely technical reasons).

The assistance of the Direction de la Statistique et de la Comptabilité Nationale of the Ministère de l'Economie et du Plan in Yaounde, the French Ministère des Relations Extérieures, the French Services de la Coopération et du Développement, the Canadian International Development Research Center, The World Bank, the Institut National de la Statistique et des Etudes Economiques (I.N.S.E.E., Paris), and the Centre Européen de formation des Statisticiens Economistes des Pays en Voie de Développement (C.E.S.D.), enabled a large numbers of participants to attend the Conference and ensured that the sessions were held in the best working conditions.

Indeed, 79 participants could be registered : 17 from Europe (among them 2 delegates from the E.C.S.O. in Luxembourg) 6 from international or regional organizations (1 delegate from U.D.E.A.C., 2 from the B.I.R.D. and 2 from the E.C.A.) ; 21 delegates from Cameroun, 22 from "Francophone" Africa (Madagascar, Niger, Benin, C.A.R., Ivory Coast, Guinea, Tunisia, Mauritania, Mali, Togo, Senegal, Congo, Gabon, Upper-Volta and Rwanda) and 13 from "Anglophone" Africa (Nigeria, Tanzania, Lesotho, Malawi, Botswana, Kenya, Uganda, Gambia and Ethiopia), (see Annex 2).

The programme of the Conference was broadly conceived so as to achieve a better understanding of the problems African national accountants have to face today, and a large number of papers, very diverse could be examined during the sessions. In-depth discussions on the presented topic took place during each session. The present publication of the proceedings of the conference includes all the presented papers.

The success of this Meeting in Douala has led several participants to express the wish for this type of Conference be organized again periodically (every 4-5 years).

Oleg ARKHIPOFF  
President  
of the Programme Committee

## PROGRAMME DE LA CONFERENCE

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## PROGRAMME OF THE CONFERENCE

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Lundi 15 Novembre 1982*Monday, November 15, 1982*

- |                                  |   |
|----------------------------------|---|
| . Matin<br><i>Morning</i>        | Ouverture officielle de la Conférence par le<br>Vice-Ministre de l'Economie et du Plan du<br>Cameroun<br><br><i>Official Opening of the Conference by the Vice-<br/>         Minister of Economy and Planning of Cameroun</i> |
| . Après-midi<br><i>Afternoon</i> | Session 1 : Le secteur traditionnel<br><i>The Traditional Sector</i><br><br>Président : MATEMBA (Malawi)<br>Senior Statistician   |

## Papiers invités

*Invited papers*

- 1° CHARMES (Tunisie) : Le secteur non structuré dans les comptes nationaux - l'expérience de la Tunisie
- 2° MKANDAWIRE (Malawi) : An Approach to Estimation of the Traditional Sector Agricultural Output of National Accounts in Malawi 1973/79.
- 3° MOTSEME (Botswana) : Agricultural Statistics in the Context of the National Accounts for Botswana.

## Papiers libres

*Contributed papers*

- 1° KOMBA (Tanzanie) : The Subsistence Sector in Tanzania
- 2° MPOGOLO (Tanzanie) : Estimation of the Contribution of the Agricultural Sector to gross Domestic Product in Developing Countries.
- 3° CHING'ANDA & MATEMBA (Malawi) : Household Surveys in the Traditional Sector of Malawi and their Impact on National Accounts.
- 4° MUWANGA ZAKE (Ouganda) : Recommendations for Improving the Estimation of Rural Income and Wealth for Tax Assessment in Uganda.



Mardi 16 Novembre 1983

*Tuesday, November 16, 1982*

. Matin

*Morning*

Session 2 : Le secteur moderne

*The Modern Sector*

Président : AMBAH (Nigeria)

Principal Statistician

Papiers invités :

*Invited papers*

- 1° Mme M. ANSON-MEYER (Bénin) : le plan comptable de l'OCAM et le Système de Comptabilité Nationale des Nations-Unies (SCN).
- 2° MUNNSAD (Kenya) : Industrial Surveys and National Accounts in Kenya
- 3° MOUYELO-KATOULA : Passage du plan comptable général des entreprises aux comptes des sociétés et quasi sociétés : Comment lever certaines difficultés?
- 4° SCHIMMLER (Chypres) : Towards Distinguishing Between Traditional and Modern Activities in the National Accounts of Developing Countries
- 5° Mc GILVRAY (Grande-Bretagne) : The use of Census and Survey data in Compiling National Accounts

. Après-midi

*Afternoon*

Session 3 : Tableau Entrées-Sorties

*Input-Output Tables*

Président : MUNNSAD (Kenya)

Papiers invités :

*Invited papers*

- 1° BRAUERS (Belgique) : Special Methods for the Elaboration of Input-Output Tables in Developing Countries
- 2° MEUNIER (France) : Un modèle économétrique pour estimer des tableaux entrées-sorties : le cas du Cameroun
- 3° MORRISON (Grande-Bretagne) : The balancing and reconciliation of Input-Output Tables
- 4° MORRISON (Grande-Bretagne) : Micro-Data bases and the Preparation of National Accounts.
- 5° SHARMA (Kenya) : Construction of Input-Output Tables and Some Structural Characteristics of the Kenyan Economy.

Mercredi 17 Novembre 1982*Wednesday, November 17, 1982*

DEPART	: 09 heures	Excursion collective touristique : Visite du
DEPARTURE	: 9 A.M	Cameroun Occidental
RETOUR	: 17 heures	<i>Touristic visit of Western Cameroun</i>
RETURN	5 P.M	
	: 19 heures	Soir : Projection d'un film sur le Cameroun
	7 P.M	<i>Evening : Film on Cameroun</i>

Jeudi 18 Novembre 1982*Tuesday, November 18, 1982*

. Matin	Session 4 : Problèmes financiers et monétaires
<i>Morning</i>	en Comptabilité Nationale
	<i>Financial and Monetary Problems</i>
	<i>in National Accounts</i>
	Président : OUATTARA
	Directeur des Etudes de la Banque
	Centrale des Etats de l'Afrique
	de l'Ouest

Papiers invités :

*Invited papers*

- 1° VIENNET (France) : Ecritures bancaires et nouveaux indicateurs économiques.
- 2° MOUYELO-KATOULA (UDEAC) : Le Plan Comptable des Banques et les opérations financières
- 3° MBAYE DIOP SARR (Sénégal) : Le tableau des Opérations financières.

. Après-midi	Session 6 <sup>x</sup> : Statistique socio-économique
<i>Afternoon</i>	en Comptabilité Nationale
	<i>Socio-Economic statistics in</i>
	<i>National Accounts</i>
	Président : Mme THIONGANE (Sénégal)
	Directeur de la Statistique

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(x) La session n° 5 consacrée aux aspects informatiques de la Comptabilité Nationale n'a pu être assurée et a donc été supprimée.

*Session 5 devoted to data processing aspects of National Accounts could not be held and was therefore cancelled.*

Papiers invités :

*Invited papers*

- 1° ALLEN (Grande-Bretagne) : The Social Accounting Matrix : Has it a purpose in Africa ?
- 2° BELLOUMI (Tunisie) : L'estimation de la masse salariale dans un pays en voie de développement. Le cas de la Tunisie
- 3° FOULON (France) : Propositions pour un traitement homogène des dépenses de santé dans la Comptabilité Nationale
- 4° Mc GILVRAY (Grande-Bretagne) : Social Accounting Matrices as a Tool for Economic Planning.

Papiers libres

*Contributed papers*

- 1° WARD (Grande-Bretagne) : Import classification in a social Accounting matrix

. Soir

*Evening*

Assemblée IARIW (pour tous)

*IARIW Meeting (for all)*

Vendredi 19 Novembre 1982

*Friday, November 19, 1982*

. Matin

Session 7 : Comptables Nationaux et Utilisateurs

*National Accounting and its users*

Présidents : NKUETE

Directeur Adjoint Banque de  
Paris et des Pays Bas

Papiers invités

*Invited papers*

- 1° NKUETE (Cameroun) : Utilisation des Comptes Nationaux (présenté par M. SAHA (Cameroun))
- 2° DRAVIE (Côte d'Ivoire) et WEBER (INSEE, France) Patrimoine naturel et Développement
- 3° CUNG (S.E.D.E.S., France) : Formation des prix et système de commercialisation.
- 4° OYONO & MINDZENG & SAHA (Cameroun) : Tableau Entrées-Sorties du Cameroun en 1976/1977.

. Après-midi  
*Afternoon*

Session 8 : La formation des comptables  
nationaux

*Training for National Accounts*

Président : TULYA MUHICA (Makerere University  
Uganda)

Papiers invités :  
*Invited papers*

- 1° IYENCAR (Zambie) : Teaching of National  
Accounts
- 2° RALAMBOSON (Madagascar) : Pour un enseignement  
plus efficace de la Comptabilité Nationale.
- 3° WEBER (France) : Kangaré, une nouvelle méthode  
d'enseignement en Comptabilité Nationale.

Papiers libres :  
*Contributed papers*

- 1° WALABYEKI-KIBIRIGE (Ouganda) : University  
Education in National Accounting
- 2° Mme CHOUDHURY (Zimbabwe) : Practical Aspects  
of Training in National Accounts with Parti-  
cular Reference to Developing Countries

Samedi 20 Novembre 1982

*Saturday, November 20, 1982*

. Matin  
*Morning*

Session 9 : La Comptabilité Nationale en  
Afrique, Expériences nationales,  
problèmes actuels et futurs

*National Accounting in Africa,  
National Experiences, Present and  
Future Problems*

Président : KOMGUEP (Cameroun)  
Directeur de la Statistique

Papiers invités :  
*Invited papers*

- 1° PILLAI & CUMMINGS-PALMER (C.E.A., Addis-  
Ababa) : Present State of National Accounts  
in Africa and ECA's Plans and Recommendations  
for its Development in the Immediate Future.
- 2° RALAMBOSON (Madagascar) : Rapport sur la  
Comptabilité Nationale Malgache

- 3° NOUMSI (Cameroun) : Traitement Automatique  
des Comptes Nationaux : expérience Camerounaise
- 4° SAHA (Cameroun) : La Comptabilité Nationale  
en Afrique - expérience nationale, problèmes  
actuels et futurs (Auteur : M. KOMGUEP)

Papiers libres :

*Contributed papers*

- 1° Mme THIONGANE (Sénégal) : L'expérience séné-  
galaise en matière de Comptabilité Nationale
- 2° Mme CHOUDHURY (Zimbabwe) & NYONI MOFFAT  
(Zimbabwe) : Problems of National Accounts  
Estimation in Zimbabwe : Actual and Future.

. Après-midi

*Afternoon*

Départ des participants

*Departure*

LISTE DES PARTICIPANTS
------------------------

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21 - DOH	MINEP, Yaoundé,	CAMEROUN
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24 - DSAMOU NGOKO, Martin	B.E.A.C., Douala	CAMEROUN
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RESUMES DES COMMUNICATIONS PRESENTEES

*SUMMARIES OF THE PRESENTED PAPERS*

## LE SECTEUR NON STRUCTURE DANS LES COMPTES NATIONAUX :

L'EXPERIENCE DE LA TUNISIE, par Jacques CHARMES

Il est maintenant bien connu que la contribution de l'artisanat - ou du secteur non structuré pour employer une terminologie plus récente - à la formation du PNB est loin d'être négligeable. En Tunisie, comme dans beaucoup d'autres économies du Tiers-Monde, ce secteur fut d'abord pris en compte par la méthode classique des soldes avant d'être complètement négligé à un moment où précisément et paradoxalement sa part dans le PNB augmentait.

Au cours des dernières années cependant, a été lancée une enquête générale et approfondie, dont les méthodes, les concepts et les résultats préliminaires sont présentés ici. Cette expérience est probablement la première tentative effectuée pour mesurer directement la contribution du secteur non structuré au PNB, sur une base quantitative et comptable, et pour mieux comprendre le rôle de ce secteur dans le processus du développement.

En comparaison avec les autres enquêtes de ce type menées dans d'autres pays du Tiers-Monde, l'enquête sur le secteur non structuré réalisée par l'Institut National de la Statistique de Tunisie (avec la collaboration de l'ORSTOM), se caractérise par 3 traits principaux qui en font un instrument privilégié d'intégration des activités non structurées dans les Comptes Nationaux :

- L'enquête a été réalisée au niveau national, à la suite du Recensement Général de la Population et d'un Recensement National des Etablissements de telle sorte que toutes les activités, dans leurs multiples modalités (moderne, non structuré en établissements, non structuré dans les ménages), ont pu être dénombrées et enquêtées.
- Des investigations qualitatives et appropriées ont permis d'adapter les méthodes de collecte et les concepts aux réalités spécifiques du secteur non structuré, afin de permettre le relevé des principaux éléments comptables nécessaires.
- L'enquête est censée être renouvelée - et elle l'a déjà été une fois - tous les 5 ans, afin de suivre les évolutions différentes des secteurs moderne et non structuré.

THE INFORMAL SECTOR IN NATIONAL ACCOUNTS : THE EXPERIENCE OF  
TUNISIA, by Jacques CHARMES

It is now well-known that craftsmanship - or informal sector in modern terms - is significantly contributing to the GNP in developing countries. In Tunisia, just like in many other third world economies, it was at first taken into account through the classical method of employment-resource balances, then completely neglected in a time when its share in GNP was paradoxically increasing.

In recent years however, a general and sophisticated survey was realized, the methods, concepts and preliminary results of which are presented here. Such an experiment is probably the first general attempt for

direct measurement of informal sector contribution to GNP, on a quantitative and accounting basis, and for a better understanding of the role it plays in development process.

Comparatively with other similar surveys in the third world, the informal sector survey carried out by the National Institute of Statistics in Tunisia (with ORSTOM Co-operation) is characterized by 3 main features : which make of it a valuable tool for integration of informal activities in National Accounts :

- The survey was carried out at a national level, following the general Population Census and in complementarity with a National Workshops Census, so that all activities in their different forms (modern, informal in workshops, informal in households) were counted and then surveyed.
- Through appropriate and qualitative investigations, methods and concepts were fitted to actual and specific cases in concern, in order to allow collecting the main necessary accounting elements.
- The survey is supposed to be - and in fact already has been - carried out each five years, in order to follow the different evolutions of both modern and informal sectors.

AN APPROACH TO ESTIMATING TRADITIONAL SECTOR AGRICULTURAL  
OUTPUT FOR NATIONAL ACCOUNTS IN MALAWI 1973-1978, by W.K. MKANDAWIRE

During the period 1964 to 1972 estimates of smallholder agricultural crop production were based on substantial subjective views of national accounts statisticians leading to considerable margins of errors in the estimates ranged from a feel of consumption requirements by the population of crops grown by smallholders, data of crop purchases by marketing boards as proxy for production estimates by smallholders to the quantification of written descriptions of crop conditions in the annual reports of the Ministry of Agriculture.

For the period subsequent to 1972 attempts have been made, and improvements are still underway, to construct smallholder crop production estimates on the basis of survey based material. This paper describes briefly the organization, management of the data collection machinery and estimation procedures given the survey data.

APPROCHE DE L'ESTIMATION DE LA PRODUCTION AGRICOLE DU SECTEUR  
TRADITIONNEL POUR LES COMPTES NATIONAUX DU MALAWI 1973-1977,  
par W.K. MKANDAWIRE

Durant la période 1964-1972, les estimations de la production agricole des petits exploitants étaient basées sur des considérations essentiellement subjectives des comptables nationaux, amenant à des marges d'erreurs considérables sur les estimations elles-mêmes. Les éléments de base pour construire de telles estimations allaient d'une "impression" sur les besoins de consommation de la population en produits vivriers cultivés par les petits exploitants, d'information sur les achats des offices de commercialisation comme pouvant représenter une estimation de la production des petits exploitants, jusqu'à la quantification des descriptions de l'état des récoltes consignées dans les rapports annuels du Ministère de l'Agriculture.

Depuis 1972, des efforts ont été faits, et les améliorations sont encore en cours, pour établir des estimations de la production des petits exploitants agricoles à partir d'enquêtes sur le terrain. Ce papier décrit brièvement l'organisation de l'appareil de collecte de l'information et les procédures d'estimation une fois les données brutes obtenues.

AGRICULTURAL STATISTICS IN THE CONTEXT OF THE NATIONAL  
ACCOUNTS FOR BOTSWANA, by Gilbert L. MOTSEMME

The agricultural projects undertaken as part of the national development plan have recently increased the demand for traditional agricultural data. This growing demand has necessitated a constant review of the national program of agricultural statistics in an attempt to satisfy the needs of a diversity of interest groups. Consequently, the program of agricultural statistics has fallen short of fulfilling the data requirements of the National Accounts' agricultural sector. Despite this and other limitations, the preparation of the economic accounts for agriculture continues to be heavily depended on data provided through the annual agricultural survey program. Still, efforts are continuing to provide more comprehensive traditional agricultural data. To complete the overall agricultural picture, other sources are also used by the National Accounts Unit. These include the Census of Production and Distribution, a mail survey which canvasses a sample of commercial farms ; the Rural Income Distribution Survey which provides estimates of the non-formal activities of traditional agriculture ; and the administrative records of government and non-government agencies. All these data sources are reviewed and their limitations are discussed.

LES STATISTIQUES AGRICOLES DANS LE CONTEXTE DE LA COMPTABILITE  
NATIONALE DU BOTSWANA, par Gilbert L. MOTSEMME

Les projets agricoles entrepris dans le cadre du plan national de développement ont récemment accru la demande d'information sur l'agriculture traditionnelle. Le programme national de statistiques agricoles a dû sans cesse être révisé pour satisfaire les besoins croissants de divers groupes d'intérêts et il s'est avéré trop limité pour les besoins de la Comptabilité Nationale. En dépit de tout cela, la préparation des comptes économiques pour l'agriculture dépend toujours largement du programme d'enquête agricole annuel. Cependant, l'effort pour obtenir de meilleures informations sur le secteur rural traditionnel se poursuit. D'autres sources sont également utilisées par le service de la Comptabilité Nationale pour compléter la description de l'ensemble de l'agriculture : le Recensement de la production et de la distribution, une enquête par voie postale auprès d'un échantillon d'exploitations agricoles commerciales, l'enquête sur la distribution des revenus ruraux qui fournit des estimations sur les activités informelles de l'agriculture traditionnelle et les rapports administratifs des agences gouvernementales et non gouvernementales. Toutes ces sources d'information sont étudiées et leurs limites discutées.



## THE SUBSISTENCE SECTOR IN TANZANIA, by J.M. KOMBA

In Tanzania, the subsistence sector covers the non-monetary part of the following sub-sectors ; crop husbandry, animal husbandry, forestry, fishing, hunting, own-account construction of rural residential buildings and imputed rental value of owner occupied dwellings.

The contribution to gross domestic product of all these sub-sectors has been of the order of 42 per cent of the total gross domestic product for the two years 1980 and 1981.

Broadly, the value of subsistence production in respect of the first four sub-sectors is obtained by deducting the value of marketed production from the value of total production of these sub-sectors. As for the other three sub-sectors, the value of subsistence production has been estimated on the basis of the results obtained from the Household Budget Survey.

The problems faced in the compilation of these estimates are numerous, i.e lack of reliable data base, delay in data collection, compilation and analysis and lack of sufficient funds and qualified personnel to undertake sample surveys in the country.

## LE SECTEUR DE SUBSISTANCE EN TANZANIE, par J.M. KOMBA

En Tanzanie, le secteur de subsistance couvre la partie non-monnaire des sous-secteurs suivants : agriculture, élevage, forêt, pêche, chasse, construction pour compte propre de bâtiments ruraux à usage d'habitation et valeur locative imputée des habitations occupées par leur propriétaire.

La contribution au PIB de ces sous-secteurs était de l'ordre de 42 % du PIB total en 1980 et 1981.

D'une façon générale, la valeur de la production de subsistance au compte des 4 premiers sous-secteurs est obtenue en soustrayant la valeur de la production commercialisée de la valeur de la production totale de ces sous-secteurs. Alors que pour les 3 autres sous-secteurs, la valeur de la production de subsistance est estimée sur la base des résultats de l'enquête budget auprès des ménages.

Les problèmes rencontrés dans l'élaboration de ces estimations sont nombreux : manque de données de base fiables, retard dans la collecte, l'exploitation et l'analyse des données, manque de crédits et de personnel compétent pour entreprendre des enquêtes dans le pays.

ESTIMATION OF THE CONTRIBUTION OF THE AGRICULTURAL SECTOR  
TO GROSS DOMESTIC PRODUCT IN DEVELOPING COUNTRIES  
by J.J. MPOGOLO

Agriculture is the most important sector in many developing countries. Some of the reasons for this is that it contributes the greatest share in GDP, it is a large foreign exchange earner and it supplies agricultural based industries with raw materials. Statistics on the sector are therefore essential to planning.

The paper surveys the methods used in African anglophone countries, particularly in Kenya, Nigeria and Tanzania, for collecting information and for working out national accounts data with respect to the agricultural sector. Specific problems arise in connection with each sub-sector : methods of estimation of production and consumption, and valorisation systems vary from country to country and may sometimes be very weak.

The conclusion highlights the weaknesses of information and procedures and outlines the need for methodological research in statistics in that sector.

ESTIMATION DE LA CONTRIBUTION DU SECTEUR AGRICOLE AU PRODUIT  
INTERIEUR BRUT DANS LES PAYS EN VOIE DE DEVELOPPEMENT  
par J.J. MPOGOLO

L'agriculture est le secteur le plus important dans beaucoup de pays en voie de développement. Il y a plusieurs raisons à cela : ce secteur représente la plus grande part du PIB, c'est un élément important du commerce extérieur et il fournit les matières premières aux industries de transformation des produits agricoles. C'est dire l'importance des statistiques sur ce secteur pour la planification.

L'auteur passe ici en revue les méthodes utilisées dans les pays africains anglophones principalement le Kenya, le Nigeria et la Tanzanie, pour collecter l'information et élaborer les données de Comptabilité Nationale concernant le secteur de l'Agriculture. Chaque sous-secteur pose des problèmes spécifiques : modes d'évaluation des productions, des consommations et systèmes de valorisation différent de pays à pays et sont parfois très fragiles.

La conclusion met en évidence les faiblesses de l'information et des procédures et la nécessité d'une recherche en méthodologie statistique pour ce secteur.

HOUSEHOLD SURVEYS IN THE TRADITIONAL SECTOR OF MALAWI  
AND THEIR IMPACT ON NATIONAL ACCOUNTS by E.F. CHIGANDA  
AND A.T. MATEMBA

The NSO had undertaken a lot of Agricultural Data collection activity from the traditional agricultural sector from the time the NSO was set up after independence in 1964 to 1968 when the first NSSA was concluded. After the publication of the report in 1970 there seems not to have been any definite plans for further data collection from this sector. To be fair it must be admitted that it was fully known that in ten years time another NSSA would be conducted. What was missing here is a plan which set out what would happen between the two major surveys.

The attempts made by the NSO between 1972 and 1975 to collect agricultural data from the traditional sector was a response to a direct pressure from the Ministry of Agriculture for up to date on the traditional agricultural sector of Malawi. A programme of surveys to update the 1968/69 NSSA by conducting agricultural survey in a few districts at a time encountered financial problems after four years and had to be halted in 1975.

From 1976 strenuous efforts were made to have agricultural surveys financed on development account as opposed to revenue account which had proved a failure between 1972 and 1975. There was then no donor who was interested in the annual agricultural surveys drawn up as part of a programme for agricultural surveys. The pilot and the main survey were financed by the British Government as part of British funded agricultural development projects in the Ministry of Agriculture.

The world Bank came up with the idea of financing the annual surveys of agriculture through a loan. The NSO and the Ministry had wanted a programme of annual agricultural surveys but had almost given up the idea because no donor was willing to finance it on the understanding that the Malawi Government would take it over after mid-1986. The future of agricultural surveys in the traditional agricultural sector is now very promising. And additional reason for optimism for the future of collection of agricultural statistics from the traditional sector arises out of the re-organisation of the NSO and the training of local staff which is the main feature of the UNDP project for the office.

LES ENQUETES AUPRES DES MENAGES DANS LE SECTEUR TRADITIONNEL  
AU MALAWI ET LEUR IMPACT DANS LES COMPTES NATIONAUX, par  
E.F. CHIGANDA ET A.T. MATEMBA

Le Bureau National de Statistique (National Statistical Office NSO) a entrepris bien des travaux de collecte d'informations agricoles sur le secteur rural traditionnel depuis sa création au moment de l'indépendance en 1964 jusqu'à 1968 quand la première enquête nationale par sondage (National Sample Survey of Agriculture, NSSA) eut abouti. Après la publication du rapport en 1970, il semble qu'il n'y ait pas eu de projet arrêté pour poursuivre la collecte dans ce secteur. Pour être clair, il faut admettre qu'on savait bien qu'une autre enquête serait faite dix ans plus tard.

Ce qui manquait là, c'est un plan qui présente ce qui se passerait entre les deux grandes enquêtes.

Les tentatives faites par le NSO entre 1972 et 1975 de rassembler des données agricoles sur le secteur traditionnel répondaient à une demande pressante du Ministère de l'Agriculture pour mettre à jour l'information sur le secteur rural traditionnel au Malawi. Un programme d'enquêtes agricoles, menées dans quelques districts à chaque fois, pour mettre à jour le NSSA de 1968/69 rencontra des difficultés financières au bout de 4 ans et dû être arrêté en 1975.

Depuis 1976, des efforts acharnés furent faits pour obtenir que les enquêtes agricoles soient financées au titre du développement, par opposition au budget de fonctionnement qui avait échoué entre 1972 et 1975. Personne ne s'intéressait alors aux enquêtes agricoles annuelles comme élément d'un programme d'enquêtes agricoles. L'enquête pilote et l'enquête elle-même furent financées par le gouvernement britannique dans le cadre des crédits britanniques pour les projets de développement rural du Ministère de l'Agriculture.

La Banque Mondiale proposa alors de financer les enquêtes agricoles annuelles par un prêt. Le NSO et le Ministère avaient souhaité un programme d'enquêtes agricoles annuelles mais avaient presque abandonné cette idée parce qu'aucun donateur ne voulait le financer sachant que le gouvernement du Malawi prendrait la suite après mi 1986. L'avenir des enquêtes agricoles dans le secteur rural traditionnel est maintenant très prometteur. Une raison supplémentaire d'optimisme pour l'avenir des statistiques agricoles sur le secteur traditionnel tient à la réorganisation du NSO et à la formation de l'équipe locale qui constituent le trait principal du projet du Programme des Nations-Unies pour le Développement pour le Bureau.

"RECOMMENDATIONS FOR IMPROVING THE ESTIMATION OF RURAL  
INCOME AND WEALTH FOR TAX ASSESSMENT IN UGANDA",  
by Elijah S.K. MUWANGA-ZAKE

The paper starts by giving the guidelines for Graduated Tax (G.T.) assessment as laid down by the Ministry of Local Government. i.e. the method used to estimate the income and wealth of rural people in Uganda is explained. However, investigations in 14 districts in the country revealed that these guidelines are not always adhered to.

A number of problems encountered and defects affecting the estimation of rural income and wealth for G.T. assessment in Uganda are then identified. The most important ones being the fact that the tax lists or registers are incomplete and the information used in the assessment is almost always incomplete and inaccurate. Attempts are then made to estimate the extend of under assessment of taxes due to each defect identified. Also a number of recommendations to improve the system of G.T. assessment are given.

In conclusion, it is stressed that the recommendations for the improvement in the estimation of rural income and wealth for G.T. assessment can first of all increase the tax revenue to the government. But even more importantly, an improved G.T. assessment exercise could, in time, be used as an alternative relatively cheap source of data on rural areas. For example a suggested expanded Tax Assessment Form could provide information which could be used by National Accounts, Agricultural Statisticians, etc. as a cross-check on the present traditional methods of data collection.

"RECOMMANDATIONS POUR AMELIORER L'ESTIMATION DU REVENU ET DE  
LA FORTUNE DES RURAUX POUR ETABLIR L'IMPOT EN OUGANDA,  
par Elijah S.K. MUWANGA-ZAKE

Le document commence par donner les instructions concernant l'assiette de la taxation progressive (graduated tax or G.T.) telle que stipulée par le Ministère de l'Administration locale, c'est-à-dire qu'on explique la méthode utilisée pour estimer le revenu et la fortune de la population rurale en Ouganda. Cependant, des enquêtes dans 14 districts du pays ont révélé que ces instructions n'étaient pas toujours suivies.

Puis on identifie un certain nombre de problèmes rencontrés et de défauts affectant l'estimation du revenu et de la fortune des ruraux pour l'assiette de la G.T.. Les plus importants sont : des registres fiscaux incomplets et une information pour l'assiette presque toujours incomplète ou inexacte. On essaie alors d'estimer la sous évaluation de l'assiette due à chacun des défauts identifiés. Un certain nombre de recommandations sont aussi données pour améliorer le système d'assiette de la G.T.

En conclusion, on insiste sur le fait que ces recommandations peuvent d'abord accroître le rendement de la taxe pour l'administration. Mais, encore plus important, la pratique d'assiette de la G.T. améliorée pourrait, à terme, constituer une autre source d'information, relativement bon marché, sur les zones rurales. Par exemple, une fiche d'assiette développée comme celle proposée pourrait fournir une information utile pour les comptes nationaux, les statisticiens agricoles, etc, par recoupement avec les méthodes traditionnelles actuelles de collecte.

L'INTEGRATION DE LA COMPTABILITE DES UNITES DANS LA COMPTABILITE  
NATIONALE par Monique ANSON MEYER

Si la Comptabilité Nationale est devenue un instrument indispensable dans tous les pays, son élaboration pose des problèmes quasi insolubles dans ceux disposant de peu de données statistiques fiables, tels les pays africains.

Telle est la raison fondamentale pour laquelle on établit les plans comptables de leurs unités productives, les pays de l'OCAM, et les membres de l'UDEAC en particulier, se sont efforcés d'assurer les possibilités d'intégration des comptabilités de leurs unités dans la Comptabilité Nationale, permettant ainsi de construire par sommations et consolidations les comptes des agents nationaux à partir de ceux de leurs unités.

De telle sorte que, grâce au PCG de l'OCAM on peut dresser les comptes de production des branches marchandes des entreprises non financières ainsi que les comptes Revenu et dépenses et Capital et financement ainsi que son annexe financière pour les Sociétés et quasi sociétés non financières ; à l'aide du Plan comptable sectoriel des banques et établissements financiers, ces mêmes comptes pour les branches marchandes financières (à l'exception des compagnies d'assurances pour lesquelles il existe un plan spécifique) et les institutions financières ; en se fondant sur le Plan comptable général de l'Etat ce sont ces mêmes comptes pour les agents branches non marchandes des administrations publiques et les agents secteur institutionnel Administrations publiques qui seront dressés.

Sans doute, la correspondance n'est-elle pas parfaite entre les deux types de comptabilité : celle des unités vise à la détermination du résultat de l'activité considéré comme la différence entre les produits et les charges supportées effectivement par l'unité, tandis que la Comptabilité Nationale ignore ces notions de charges et de produits et se place du point de vue de la répartition du produit pour faire apparaître l'épargne nette de la nation. Ce qui est charge pour la première peut ainsi être une opération de répartition pour la seconde.

Mais, il n'en demeure pas moins que l'intégration des comptes constitue une étape importante vers une plus grande fiabilité des comptes de la nation.

INTEGRATING INDIVIDUAL UNITS' ACCOUNTS INTO NATIONAL  
ACCOUNTS by Monique ANSON MEYER

Though national accounts have become an indispensable device in all countries, quasi insuperable problems arise concerning their development in countries where reliable statistical data are few like in African countries.

This is the basic reason which has led OCAM countries and UDEAC member countries in particular, to ensure the feasibility of integrating individual units' accounts into national accounts when drawing accounting plans for their producing units. This allows the accounts of domestic transformers to be constructed by summing and consolidating the accounts of their constituting units.

With the help of the OCAM General Accounting Plan it therefore becomes possible to set up production accounts of non-financial enterprises as well as the income and outlay accounts, and capital and finance accounts together with its financial annex for non-financial enterprises, corporate and quasi corporate ; with the help of the sectorial accounting plan of banks and financial establishments it is also possible to set up the same accounts for financial industries (excluding insurance companies subjected to a specific accounting plan) and financial institutions ; based on the government General Accounting Plan the same accounts may be set up for producers of government services and the public administration institutional sector.

No doubt, the two types of accounts do not match perfectly : units' accounts aim at determining the result of an activity regarded as the difference between products and costs actually incurred by the unit, whereas national accounts ignore these notions of costs and products and consider the distribution of the product so as to show the net savings of the country. What is regarded as costs for the former can thus be a distribution operation for the latter.

Nevertheless, integrating accounts is a major step towards a greater reliability of national accounts.

INDUSTRIAL SURVEYS AND NATIONAL ACCOUNTS IN KENYA  
by Kanti MUNNSAD

The first part of the paper describes the system of industrial surveys set up by the Central Bureau of Statistics.

The first industrial production survey was conducted in 1954. A survey is conducted annually since 1963 ; the coverage and the sampling rates vary.

This is complemented by an additional monthly survey of industrial production from which a quantity index of manufacturing is derived.

The mining and quarrying sector is covered by information from the Mines and Geological Department. A construction cost index is compiled by the Central Bureau of Statistics.

The second part of the paper presents, for each sector (Mining and Quarrying, Manufacturing, Building and Construction, Electricity and Water), the methods used for compiling production accounts at current and constant prices from data sources.

ENQUETES INDUSTRIELLES ET COMPTABILITE NATIONALE AU KENYA  
par Kanti MUNNSAD

La première partie de cette communication décrit le système d'enquêtes industrielles mis en place auprès du Central Bureau of Statistics.

La première enquête de production a été réalisée en 1954. Depuis 1963, une enquête est faite annuellement ; le champ et les taux de sondage varient.

Ceci est complété par une enquête mensuelle sur la production industrielle dont on tire un indice de production.

Le secteur des mines et carrières est couvert par des informations en provenance du Département des Mines et de la Géologie. Un indice du coût de la construction est établi par le Central Bureau of Statistics.

La seconde partie du document présente, pour chaque secteur (Mines, industries de transformation, Bâtiment et travaux publics, électricité et eau), la méthode d'utilisation des sources pour établir les comptes de production à prix courants et à prix constants.



PASSAGE DU PLAN COMPTABLE GENERAL DES ENTREPRISES AUX  
COMPTES DES SOCIETES ET QUASI SOCIETES NON FINANCIERES :  
COMMENT LEVER CERTAINES DIFFICULTES ... ?  
par Michel MOUYELO-KATOULA

L'auteur souligne un certain nombre de difficultés que rencontre le comptable national qui ayant à sa disposition les comptes des sociétés et quasi-sociétés non financières selon le PCG-OCAM veut les transcrire selon les concepts du SCN. Il passe en revue les points posant problèmes, l'explicitation de ces problèmes devant, plutôt que de proposer des méthodes, orienter la réflexion selon différentes directions.

Ces problèmes délicats - qui empêchent tout passage automatique entre PCG-OCAM et SCN - se posent particulièrement pour les points suivants :

- le traitement de la consommation intermédiaire en services d'assurance-dommages ;
- l'évaluation de la consommation de capital fixe ;
- l'estimation du revenu prélevé par les entrepreneurs de quasi-sociétés ainsi que l'apport en capital des propriétaires de ces quasi-sociétés.

SOME DIFFICULTIES IN THE CONVERSION FROM THE GENERAL ACCOUNTING PLAN OF ENTERPRISES TO THE ACCOUNTS OF NON FINANCIAL ENTERPRISES, CORPORATE AND QUASI-CORPORATE : HOW CAN THEY BE OVERCOME ?  
by Michel MOUYELO-KATOULA

When the accounts of non financial enterprises, corporate and quasi-corporate are compiled according to the OCAM General Accounting Plan, national accountants face a number of problems when transcribing them according to SNA concepts. The author underlines those problems ; their examination is more designed to stimulate thinking in a few directions rather than to propose solutions.

These vexing problems -which prevent any automatic conversion from the OCAM General Accounting Plan to the SNA- relate especially to the following points :

- the treatment of intermediate consumption of casualty insurance services ;
- the estimation of consumption of fixed capital ;
- the estimation of withdrawals from entrepreneurial income of quasi-corporate enterprises as well as the proprietors' net addition to the accumulation of quasi-corporate enterprises.

DISTINGUISHING BETWEEN TRADITIONAL AND MODERN ACTIVITIES  
IN THE NATIONAL ACCOUNTS OF DEVELOPING COUNTRIES  
by Harry SCHIMMLER

This study has been carried out to provide a basic background for any work that intends to introduce into the national accounts of a developing country a distinction between modern and traditional activities. In a developing economy there are several dualistic distinctions possible, each serving a different purpose. There is a considerable degree of overlap between the various dualisms, and of them the traditional-modern split provides the largest common denominator. Distinguishing between a traditional sector and a modern sector serves the purpose of supplying data on the use of resources by two crucially important dynamic elements in the economy ; there is also less need for additional information on other dualisms.

Activities are distinguished in the study by their mode of production. When making a strictly dualistic division on this basis there will be clashes between the apparent character of the result of an activity and the apparent character of the category to which the producing unit pursuing the activity has been assigned. Certain products clearly have the character of being non-traditional whereas the producing unit must be considered as traditional when it employs manpower and machines in a traditional fashion. To help eliminate such clashes four rather than two modes of production have been identified : fully traditional, semi-traditional, semi-modern and fully modern. To which of these categories a production process belongs depends on the relative sophistication of its organisation and technology ; organisation input and technology content being the two basic criteria whose joint application is proposed by the study.

The immediate objective of the study is to propose operational criteria for distinguishing by their modes of production four sectors of traditional and modern activities. However available data do not usually correspond to theoretically based criteria because observations have not been made according to these criteria. Thus at the ex-post stage empirically based criteria have to be used as proxies. Here the question is whether the proxies facilitate the division of available data into the same sectors as those defined by the theoretically based criteria ; this they must do if the resulting distinction between traditional and modern activities is to be valid.

The study should be seen more as a discussion of guidelines that can be followed so that actual data can be derived. The situation in relation to the availability of data and corresponding proxies for the division into sectors varies among developing countries. However the basic principles outlined should make it possible to elaborate or simply find corresponding proxy indicators for a useful distinction of the sectors in most developing economies.

LA DISTINCTION ENTRE ACTIVITES TRADITIONNELLES ET ACTIVITES  
MODERNES DANS LES COMPTES NATIONAUX DES PAYS EN VOIE DE  
DEVELOPPEMENT, par Harry SCHIMMLER

L'objectif de cette étude est de fournir les éléments de base sur lesquels pourront s'appuyer les divers travaux visant à introduire une distinction entre activités modernes et activités traditionnelles dans les comptes nationaux de tel ou tel pays en voie de développement. Dans une économie en voie de développement plusieurs distinctions dualistes sont possibles, chacune visant à satisfaire des objectifs spécifiques. Ces divers types de dualisme se recoupent largement et, parmi eux, la division traditionnel-moderne fournit de loin le plus grand dénominateur commun. La distinction entre secteur traditionnel et secteur moderne a pour but de fournir des données sur l'utilisation des ressources par deux éléments dynamiques et d'une importance cruciale de l'économie ; la nécessité de recueillir des informations supplémentaires sur les autres formes de dualisme est aussi moins grande.

Dans cette étude on distingue les activités selon leur mode de production. L'établissement d'une division strictement dualiste sur la base de ce critère engendre des incohérences entre le caractère apparent du résultat d'une activité et le caractère apparent de la catégorie dans laquelle l'unité productrice poursuivant cette activité a été classée. Certains produits ont de toute évidence la caractéristique de n'être pas traditionnels alors que l'unité productrice doit être considérée comme traditionnelle si elle emploie la main-d'oeuvre et utilise les machines d'une façon traditionnelle. Afin de permettre l'élimination de telles incohérences on a identifié quatre - plutôt que deux - modes de production : entièrement traditionnel, semi-traditionnel, semi-moderne et entièrement moderne. La catégorie à laquelle appartient un processus de production dépend de la sophistication relative de son organisation et de sa technologie ; le mode d'organisation et le contenu technologique sont les deux critères essentiels dont l'application combinée est proposée dans la présente étude.

L'objectif immédiat de l'étude est de proposer des critères opérationnels destinés à distinguer quatre secteurs d'activités traditionnelles et modernes en fonction de leur mode de production. Néanmoins, les données disponibles ne correspondent généralement pas aux critères fondés sur la théorie parce que les observations n'ont pas été faites selon ces critères. Ainsi une fois les données collectées on ne peut qu'utiliser des critères empiriques comme substituts. La question est alors de savoir si ces substituts facilitent la division des données disponibles en secteurs identiques à ceux définis par les critères fondés sur la théorie ; il faut qu'ils y parviennent si l'on veut que la distinction entre activités traditionnelles et activités modernes soit valide.

L'étude doit plutôt être considérée comme une discussion de grandes lignes que l'on pourra suivre afin d'obtenir les données réelles nécessaires. S'agissant de la disponibilité des données et des substituts correspondants pour la division en secteurs, la situation varie selon les pays en voie de développement. Cependant les principes essentiels énoncés devraient permettre d'élaborer ou simplement de trouver des indicateurs de substitution correspondants pour l'établissement d'une distinction sectorielle utile dans la plupart des économies en voie de développement.

THE USE OF CENSUS AND SURVEY DATA IN COMPILING NATIONAL ACCOUNTS  
by J.W. Mc GILVRAY

The compilation of reliable National Accounts is a means to upgrade management efficiency of the economy, including the formulation and implementation of development plans. The author calls on his own experience as a user of national accounts and proposes a general schedule of survey work coordinated with the planning horizon, most often a five years cycle.

Agriculture	census or large scale survey every
Industry	4 or 5 years, with sample inquiries
Construction	for intervening years
Distribution	
Multipurpose household surveys	Annual but variable in size and content
Indices of wholesale and retail prices	Annual or quarterly

The other sectors should be studied at less frequent intervals. An Input Output table should be constructed for those years in which an industrial census is conducted.

This programme implies a substantial increase in resources allocated to National Accounts work including computerisation. But the potential pay-off from an improved series of National Accounts is large.

L'UTILISATION DES DONNEES D'ENQUETES ET DE RECENSEMENT POUR  
LA COMPTABILITE NATIONALE,  
par J.W. Mc GILVRAY

La confection de comptes nationaux solides est un moyen pour mieux diriger l'économie, y compris la formulation et l'application des plans de développement. L'auteur fait appel à sa propre expérience d'utilisateur des comptes et propose un programme d'enquêtes coordonnées avec l'horizon de la planification, le plus souvent un cycle de 5 ans.

Agriculture	Recensement ou enquête à grande
Industrie	échelle, tous les 4 ou 5 ans, avec
Bâtiment	enquête sur échantillon pour les
Distribution	années intermédiaires.
Enquête ménages à buts multiples	Annuelle mais variable en taille et contenu.
Indices des prix de gros et de détail	Annuels ou trimestriels.

Les autres secteurs devraient être étudiés à intervalle plus long. Un tableau Entrées-Sorties devrait être construit pour les années où il y a un recensement industriel.

Ce programme implique une augmentation substantielle des ressources consacrées aux travaux de comptabilité nationale, y compris l'information. Mais la rentabilité potentielle d'une série fiable de comptes nationaux est grande.

SPECIAL METHODS FOR AN INPUT-OUTPUT APPROACH IN DEVELOPING COUNTRIES, by Prof. Dr. W.K. BRAUERS

The two main problems for an input-output approach and for the setting up of econometric models in general, in developing countries are on the one side the lack of information and on the other side the very special characteristic problems of the economies of these countries.

For the first problem the application of the P.E.S.-method (Prices, Extrapolations and Structural changes) may be helpful. At this occasion information is eventually borrowed from similar sectors in other countries. Another possibility is the assistance of labor matrices not as a substitute for the usual input-output tables but as a supplementary device.

For the characteristics of the economy of developing countries, a special interest is given to :

- a) the traditional and the non-traditional sectors ;
- b) import substitution by internal delivered goods ;
- c) sensitivity and power of dispersion of the sectors and block formation by several sectors.

METHODES PARTICULIERES POUR UNE APPROCHE INPUT-OUTPUT DANS LES PAYS EN VOIE DE DEVELOPPEMENT, par Prof. Dr. W.K. BRAUERS

Dans les pays en voie de développement, les deux principaux problèmes d'une approche input-output et, en général, de l'établissement de modèles économétriques sont, d'une part, le manque de données et, d'autre part, les problèmes très particuliers caractéristiques des économies de ces pays.

Pour résoudre le premier problème l'application de la méthode P.E.S. (Prix, Extrapolations et changements Structurels) peut se révéler utile. Celle-ci pourra requérir l'emprunt éventuel de données concernant des secteurs semblables dans d'autres pays. On pourra également faire appel aux matrices d'emploi non comme substitut pour les tableaux entrées-sorties classiques mais en tant qu'instrument complémentaire.

En ce qui concerne les caractéristiques des économies des pays en voie de développement, font l'objet d'un intérêt particulier :

- a) les secteurs traditionnels et non-traditionnels ;
- b) la substitution des produits nationaux aux importations ;
- c) la sensibilité et le pouvoir de dispersion des secteurs et la constitution de blocs par plusieurs secteurs.

UN MODELE ECONOMETRIQUE POUR ESTIMER DES TABLEAUX ENTREES-  
SORTIES : LE CAS DU CAMEROUN par François MEUNIER

La construction d'un tableau entrées-sorties (TES) s'apparente davantage à une modélisation qu'à une description comptable des échanges inter-branches. La méthode proposée ici est microéconomique ; elle consiste à calculer par des moyens économétriques, les coefficients techniques de branches à partir des données individuelles d'entreprises. Elle permet aussi la construction des comptes d'exploitation par branche. Elle s'applique particulièrement aux pays en voie de développement où les structures industrielles restent assez simples, et où les données d'enquêtes industrielles peuvent comporter un nombre non négligeable d'erreurs statistiques.

AN ECONOMIC MODEL FOR ESTIMATING INPUT OUTPUT TABLES :  
THE CASE OF CAMEROUN by François MEUNIER

The construction of an input-output table (commodity x commodity) is more akin to a modelisation than a mere statistical description of interindustry trade. The method proposed here is microeconomic and involves an estimate of technical coefficients on the basis of individual firm data. It also allows for constructing income statement by branch. The method is especially relevant for developing economies, where industrial structures are not too complicated, and where industry surveys may account for a reasonable amount of statistical errors.

THE BALANCING AND RECONCILIATION OF INPUT-OUTPUT TABLES  
by W.I. MORRISON

This paper examines of the problems involved in constructing input-output tables in the context of the SNA, and in particular focuses on the fundamental questions of balancing and reconciliation.

It is suggested that in circumstances where some survey data are available, the initial emphasis should be placed on techniques which involve the removal of major statistical discrepancies by the further investigation of the basic data.

In those situations where very few data exist, more mathematical approaches to balancing may be appropriate, and, among them, those which permit the inclusion of additional information in the form of constraints on the estimation procedure have most to offer. But practical solutions and professional judgement will always be required in any balancing exercise.

L'EQUILIBRAGE ET LA RECONCILIATION DES TABLEAUX ENTREES-SORTIES  
par W.I. MORRISON

Ce papier examine certains des problèmes liés à la confection des tableaux entrées-sorties dans le contexte du système de comptabilité nationale, et il étudie en particulier les questions fondamentales de l'équilibrage et de la réconciliation des comptes.

Lorsqu'un minimum de données d'enquêtes est disponible, l'auteur suggère de privilégier d'abord les techniques qui permettent l'élimination des principales incohérences statistiques grâce à une investigation plus poussée des données de base.

Lorsqu'il n'existe que très peu de données, des approches plus mathématiques d'équilibrage peuvent se révéler appropriées, et, parmi celles-ci, celles qui autorisent l'inclusion d'informations supplémentaires sous la forme de contraintes imposées à la procédure d'estimation apparaissent des plus prometteuses. Cependant, des solutions pratiques et un jugement d'expert seront toujours nécessaires pour tout travail d'équilibrage.

MICRO-DATA BASES AND THE PREPARATION OF NATIONAL ACCOUNTS  
by W.I. MORRISON

This contribution focuses on the most appropriate methods of developing computer-based data files -an option which has been made feasible in most countries by the progress in the computing fields in recent years-, and the need to construct national accounts statistics based on individual returns.

As a starting point some general principles of data management are discussed. Then micro-data bases are examined in relation to the construction of a set of national accounts, with special reference to a macro-framework such as the SNA or a SAM (social accounting matrix), and some of the practical problems involved in the implementation of micro-data bases are considered.

This paper demonstrates the need to consider data as part of the overall planning process, linked to both the administrative and management procedures on the one hand and the political objectives of planning on the other. The micro-data systems introduced will vary from country to country, but the general principles outlined will still apply.

LES BASES DE MICRO-DONNEES ET LA PREPARATION DES COMPTES NATIONAUX  
par W.I. MORRISON

La présente communication porte sur les méthodes les plus appropriées pour l'établissement des fichiers informatiques de données- choix qui est devenu possible dans la plupart des pays grâce aux progrès de l'informatique réalisés ces dernières années- et la nécessité de construire les statistiques des comptes nationaux à partir des déclarations individuelles.

La discussion de certains principes généraux de gestion des données sert de point de départ. Le papier examine ensuite les bases de micro-données en rapport avec la construction d'un ensemble de comptes nationaux, en considérant plus particulièrement un cadre macro-économique tel que le système de comptabilité nationale ou une matrice de comptabilité sociale (SAM), et il étudie quelques problèmes pratiques liés à la mise en place des bases de micro-données.

Ce papier montre la nécessité de considérer les données comme faisant partie d'un processus d'ensemble de planification relié d'une part aux procédures administratives et de gestion, et aux objectifs politiques de planification d'autre part. Les systèmes de micro-données introduits peuvent varier d'un pays à l'autre, mais les principes généraux énoncés demeurent.



CONSTRUCTION OF INPUT-OUTPUT TABLES AND SOME STRUCTURAL  
CHARACTERISTICS OF THE KENYAN ECONOMY  
by K.L. SHARMA

This paper deals with salient features of the Kenyan Input-Output tables and analyses some structural aspects of the Kenyan economy using the recent Input-Output table for the year 1976. The tables are fairly detailed and comprehensive ones in comparison to tables prepared in other developing countries at a similar stage of development. Sectoral classification, treatment of imports and distribution of margins in these tables provide an opportunity to make detailed analysis. It is suggested that the number of sectors should be further disaggregated and the tables should be prepared at frequent intervals.

Structural characteristics are analysed with respect to distribution of sectoral gross value added, cost composition of outputs, pattern of demands, and composition of supplies of sectoral outputs. It is found that agriculture contributes maximum (36.44 percent) of gross value added at factor cost. The intermediate demand for agricultural products accounts for 25.32 percent of the aggregate demand while it is 42 to 53 percent for manufacturing products. It is also observed that the contribution by other sectors to gross domestic product is high when the particular sector depends primarily on other sectors for its inputs.

LA CONSTRUCTION DE TABLEAUX ENTREES-SORTIES ET QUELQUES  
CARACTERISTIQUES STRUCTURELLES DE L'ECONOMIE DU KENYA  
par K.L. SHARMA

Ce papier traite des caractéristiques principales des tableaux entrées-sorties du Kenya et analyse quelques aspects structurels de l'économie de ce pays à l'aide des tableaux entrées-sorties de l'année 1976 publiés récemment. Les tableaux sont relativement détaillés et assez complets en comparaison de ceux établis dans d'autres pays ayant atteint un niveau de développement similaire. La classification sectorielle, le traitement des importations et la distribution des marges dans ces tableaux permettent de procéder à des analyses détaillées. Il est suggéré que le nombre des secteurs devrait être davantage désagréé et que les tableaux devraient être établis à intervalles fréquents.

L'analyse des caractéristiques structurelles concerne la distribution sectorielle de la valeur ajoutée brute, la structure des coûts de production, la structure de la demande et la composition de l'offre de production sectorielle. L'auteur trouve que l'agriculture apporte la contribution la plus importante (36,44 %) à la valeur ajoutée brute au coût des facteurs. La demande intermédiaire de produits agricoles représente 25,32 % de la demande globale alors que, pour les produits manufacturés, le pourcentage varie de 42 à 53 %. L'auteur fait également observer que la contribution des autres secteurs au produit intérieur brut est élevée lorsqu'ils dépendent principalement d'autres secteurs pour leurs consommations intermédiaires.

ECRITURES BANCAIRES ET NOUVEAUX INDICATEURS ECONOMIQUES  
par H. VIENNET

Les possibilités croissantes de l'informatique de gestion bancaire autorisent la constitution d'indicateurs économiques et financiers nouveaux et efficaces reposant sur quelques principes simples. On peut en particulier envisager que les numéros de comptes courants bancaires des entreprises comportent un code économique. De la sorte, lorsqu'un compte serait crédité, on identifierait sa propre activité, et celle du compte débité. A partir d'un logiciel simple, on parviendrait alors à identifier les règlements inter-industriels et commerciaux.

L'intégration du code d'activité économique des entreprises, acteurs des opérations financières conduirait à la construction automatique de deux tableaux de flux :

- un tableau des règlements inter-industriels et commerciaux décrivant les flux financiers pendant une période donnée, entre les branches d'activité économique

- un tableau des services bancaires aux entreprises qui fournirait selon la même périodicité les flux par nature d'opération, entre le secteur bancaire et les entreprises de chaque branche.

Le principe de ces deux tableaux étant admis, il conviendrait d'en examiner la signification et les limites : quelles modalités d'écritures devraient-ils inclure ? Quelles seraient les pratiques de paiement qui y échapperaient ? Quelle serait leur couverture de la réalité financière ? Quelle serait précisément la signification économique de ces tableaux ?

Le contenu des deux types de tableaux étant bien compris, serait-il possible et opportun de les intégrer dans les comptes économiques ? Cette intégration, - si elle a lieu d'être, - serait-elle efficace ? Contribueraient-ils à la construction de comptes trimestriels, ou bien devraient-ils être annexés aux comptes économiques sans y être intégrés ?

L'articulation entre le Tableau des Echanges Interindustriels et le tableau des règlements interindustriels et commerciaux sera analysée de même l'articulation entre le Tableau des Opérations financières et le tableau des services bancaires aux entreprises.

Au cas où l'intérêt des nouveaux tableaux serait reconnu, il conviendrait d'examiner l'opportunité et la possibilité technique de les instituer. Les difficultés pratiques devraient au moins sommairement être inventoriées. Le coût d'aménagement et de fonctionnement du dispositif de production de l'information mériterait d'être évalué. Les dispositions réglementaires à prendre seraient utilement évoquées.

## BANK ACCOUNTS AND NEW ECONOMIC INDICATORS

by Henri VIENNET

The increasing possibilities of computerized banking management allow the development of new and efficient economic and financial indicators based on a few basic principles. One can suggest, for example, the inclusion of an economic code into enterprises' bank open account numbers. In that way, whenever an account is credited, both its activity and that of the debited account would be identified. Thus, with the help of a simple software programme, interindustrial and trade settlements could be identified.

Integrating the economic activity code of enterprises, agents of financial operations, would lead to the immediate setting up of two tables :

- an interindustrial and trade settlement table describing the financial flows among economic sectors over a given period
- a table of bank services supplied to enterprises, which would show the flows by types of operation between the banking sector and the enterprises in each economic branch.

Once the principle of these two tables has been admitted, their meaning and limitations should be examined : what types of accounting procedures would they include ? What methods of payment would not be covered ? What could be their coverage of the financial reality ? What would exactly be the economic meaning of these tables ?

Once the contents of these two types of tables have been well understood, would it be feasible and advisable to integrate them into economic accounts ? In the event of such an integration, would it be efficient ? Would they help to set up quarterly accounts ? Or should they be attached to the economic accounts without formal integration ?

The connection between the interindustry matrix and the interindustrial and trade settlement table as well as the connection between the flow of funds table and the table of bank services to enterprises would be analysed.

If the interest of the new tables were accepted, the opportunity and the technical feasibility of their elaboration would have to be examined. Practical difficulties should at least be summarily listed. It would be worth to estimate the costs of organizing and operating the system producing the necessary information. Regulations to be laid down would usefully be touched upon.

POUR RATIONALISER ET FACILITER LES ENQUÊTES AUPRES  
DES INSTITUTIONS FINANCIERES : LE PLAN COMPTABLE NATIONAL  
DES BANQUES ET ETABLISSEMENTS FINANCIERS (L'EXEMPLE DE L'UDEAC)  
par Michel MOUYELO-KATOULA

Depuis le 1.1.1981, un plan national des banques et établissements financiers (émanant du PCG-OCAM) est en vigueur dans l'UDEAC.

Après avoir souligné l'apport que représente ce plan comptable pour les comptes nationaux, l'auteur examine l'adéquation des "soldes caractéristiques" de gestion du PC aux flux du SCN, le problème de la comptabilisation des stocks et le classement des opérations financières selon leur degré de liquidité, classement bien adapté aux concepts du SCN.

Dans la mesure où il serait possible d'adjoindre à ces tableaux comptables des enquêtes auprès des établissements permettant d'appréhender les opérations financières par nature, objet et destinations, on serait en possession des données suffisantes pour établir non seulement des tableaux des opérations financières mais aussi des comptes de financement.

MAKING FINANCIAL INSTITUTION SURVEYS MORE RATIONAL AND EASY :  
THE NATIONAL ACCOUNTING PLAN OF BANKS AND FINANCIAL ESTABLISHMENTS  
(THE EXAMPLE OF UDEAC),  
by Michel MOUYELO-KATOULA

Since January 1, 1981, a national accounting plan of banks and financial establishments (deriving from the OCAM General Accounting Plan) has been implemented within UDEAC.

The paper first underlines the contribution made by such an accounting plan to national accountants. It then examines the adequation of the "results of main operations" table of the accounting plan to the flows of the SNA, the problem of stock accounting and the classification of financial operations according to their degree of liquidity, a classification well adapted to the SNA concepts.

Insofar as it would be possible to complement these accounting tables with establishment surveys, providing data on financial operations by character, purposes and uses, enough data would be available to compile flow-of-funds tables as well as finance accounts.

PROBLEMES MONETAIRES ET FINANCIERS EN COMPTABILITE NATIONALE :  
LE TABLEAU DES OPERATIONS FINANCIERES, EXEMPLE D'APPLICATION,  
Banque Centrale des Etats de l'Afrique de l'Ouest

A partir des éléments disponibles au niveau de la Banque Centrale (situation des banques et des établissements financiers, balance générale du Trésor et balance des paiements) il est possible de construire des TOF en encours et les variations annuelles des flux selon une nomenclature assez fine d'opérations et par secteur institutionnel. L'auteur précise les limites de l'exercice dues aux regroupements, dans les situations bancaires, des opérations concernant les entreprises et les particuliers d'une part, et à l'absence de toute information concernant certaines unités (caisses de retraite et assurances) d'autre part.

Après avoir commenté sur plusieurs années l'évolution des équilibres financiers des différents secteurs, l'auteur propose une méthode itérative permettant de s'assurer de l'adéquation, dans le cadre de comptes prévisionnels, des hypothèses de croissance du PIB et d'une progression souhaitée de la masse monétaire.

MONETARY AND FINANCIAL PROBLEMS IN NATIONAL ACCOUNTING : THE  
FLOW-OF-FUNDS TABLE - AN ILLUSTRATIVE EXAMPLE  
Banque Centrale des Etats de l'Afrique de l'Ouest (Central Bank  
of the Western African Countries)

From information available at the Central Bank (the financial statements and financial establishments, the Treasury General Balance, and the Balance of payments) it is possible to compile Flow-of-Funds tables and annual variations of flows according to a rather detailed classification of operations, and by institutional sector.

The author specifies the limitations of such an exercise. They arise, first, because of the grouping of the operations relating to enterprises and individuals and, on the other hand, because of the lack of information regarding some units (pension funds and insurance companies).

After a few comments on the evolution of the financial balances of the various sectors, the author proposes an iterative procedure to ensure, within the framework of national accounts projections, the consistency between Gross Domestic Product growth hypotheses and the desired increase of money supply.

THE SOCIAL ACCOUNTING MATRIX : HAS IT A PURPOSE  
IN AFRICA ? by Richard M. ALLEN

During the past 10 years the Overseas Development Administration of the UK Foreign and Commonwealth Office has been associated with a programme on the study of the Social Accounting Matrix (SAM) which has included the construction of matrices for Botswana, Kenya and Swaziland.

The paper briefly describes the SAM and discusses its relationship with the United Nations System of National Accounts. In particular it discusses the treatment of prices for transactions involving commodities and suggests that for the SAM the use of transaction prices is to be preferred to the uniform use of either producer or purchaser prices.

The discussion of data requirements for the SAM and its advantages over other presentations of socio-economic data leads to the conclusion that, despite the criticisms that have been made of the SAM, it has a purpose both in the development of statistical services and statistical analysis.

It is the view of the author that national statisticians and planners should be encouraged to adopt the system and use it ; that with experience they will appreciate its value ; and that it should become the corner-stone of data for economic development planning.

MATRICE DE COMPTABILITE SOCIALE : Y EN A T-IL BESOIN EN AFRIQUE ?  
par Richard M. ALLEN

Pendant les dix dernières années, l'Overseas Development Administration du Foreign and Commonwealth Office du Royaume Uni, a été associé à un programme concernant l'étude de la Matrice de la Comptabilité Sociale (Social Accounting Matrix : SAM) y compris la construction de matrices pour le Botswana, le Kenya et le Swaziland.

Cet exposé présente brièvement la SAM et considère les rapports qui existent entre celle-ci et le système de Comptabilité Nationale des Nations Unies. Il considère en particulier le traitement des prix concernant les opérations liées aux produits, et suggère que pour la SAM l'emploi des prix de transaction est préférable à l'emploi uniforme soit des prix de production, soit des prix d'achat.

La discussion relevant des données requises pour la SAM et les avantages de celle-ci comparés à d'autres formules de données socio-économiques, nous mène à la conclusion suivante : malgré les critiques lancées contre la SAM, elle a deux fins, d'une part celle de l'évolution des services de la statistique, et d'autre part, la mise en valeur de l'analyse des statistiques.

C'est ainsi que l'auteur envisage que les statisticiens nationaux et les planificateurs devraient être encouragés à adopter ce système et à l'utiliser ; et qu'en gagnant de l'expérience ils viendraient à l'apprécier à sa juste valeur. Ce système devrait donc devenir la pierre angulaire de la planification du développement économique.

\* La session 5 consacrée aux aspects informatiques de la comptabilité nationale n'a pu être assurée et a donc été supprimée.

*Session 5 devoted to data processing aspects of National Accounts could not be held and was therefore cancelled.*

ESTIMATION DE LA MASSE SALARIALE DANS LES PAYS EN VOIE DE  
DEVELOPPEMENT : LE CAS DE LA TUNISIE  
par Ahmed BELLOUMI

Pour plus de justice sociale, il est important de répartir équitablement le revenu national entre les différents agents économiques ... mais ne faut-il pas mesurer d'abord les différents types de revenu (Rémunération des salariés, excédent d'exploitation, revenu de la propriété ou de l'entreprise ...)

Avec le développement de la salarisation de la population active, il est primordial d'estimer la rémunération des salariés car elle intéresse environ 60 % de la dite population, l'Institut National de la Statistique a mis sur pied tout un service qui s'occupe de la collecte et de l'analyse de l'évolution des salaires et de l'emploi salarié dans le pays.

La Comptabilité Nationale ne peut se développer qu'avec l'amélioration et le développement des statistiques spécialisées ; les données existent mais il faut les exploiter statistiquement.

ESTIMATING THE WAGE BILL IN DEVELOPING COUNTRIES :  
THE CASE OF TUNISIA  
by Ahmed BELLOUMI

To achieve more social justice it is important to distribute fairly national income among the various economic agents ... For this, the different types of income have to be measured first (compensation of employees, operating surplus, property income, entrepreneurial income ...)

With the extension of wage employment, it is essential to estimate the compensation of employees, since around 60 % of the active population are involved. The Institut National de la Statistique has set up a department which collects and analyses the development of wages and wage employment in the country.

National accounts cannot progress without specialized statistics being improved and developed since data are available, but they need statistical processing.

PROPOSITION POUR UN TRAITEMENT DES DEPENSES DE SANTE DANS LA  
COMPTABILITE NATIONALE DANS LES PAYS EN DEVELOPPEMENT  
par Alain FOULON

L'analyse économique du domaine de la santé, et, a fortiori, les comparaisons internationales sur ce sujet soulèvent de nombreuses difficultés, notamment lorsque les activités correspondantes sont financées conjointement par les ménages et les administrations publiques selon des procédures aussi nombreuses que variées. Par ailleurs les méthodes du SCN de l'ONU, trop centrées sur les biens, se révèlent vagues ou inopérantes pour le traitement de la plupart des services. Pour résoudre ces problèmes il convient au préalable d'étudier le concept de service et ses implications en Comptabilité Nationale, puis de délimiter le domaine de la santé à l'intérieur duquel des évaluations économiques sont possibles, en tenant compte des spécificités des activités sanitaires, notamment si elles concernent un pays développé ou en développement. Ensuite, s'appuyant sur le SCN et au moyen de huit tableaux et comptes, d'ailleurs interdépendants, nous proposons deux agrégats : la Consommation Médicale Nationale et la Dépense Nationale Courante de Santé. Les ventilations détaillées et harmonisées de ces agrégats devraient rendre possibles des comparaisons internationales en valeur, prix et volume.

PROPOSAL FOR A TREATMENT OF HEALTH EXPENDITURES IN THE  
NATIONAL ACCOUNTS OF DEVELOPING COUNTRIES, par Alain FOULON

Many difficulties arise as to the economic analysis of the health sector, and, all the more, as to international comparisons in that field, especially where the corresponding activities are jointly financed by households and the government according to procedures both numerous and various. Moreover, United Nations SNA methods, focusing too much on commodities, are vague and inefficient regarding the treatment of most services. To overcome such problems it is advisable to undertake a preliminary study of the concept of service and its implications in national accounts, then to demarcate the health sector within which economic estimations are possible, taking into account the specific features of health activities, in particular whether they apply to a developed or to a developing country. Resting on the SNA and by means of eight interdependent tables and accounts, we then propose two aggregates : The National Medical Consumption and the National Current Health Expenditure. Their detailed and standardized disaggregation should allow international comparisons in value, price and volume.



SOCIAL ACCOUNTING MATRICES, NATIONAL ACCOUNTS AND  
ECONOMIC PLANNING, by J.W. Mc GILVRAY

Although the last decade has witnessed considerable progress in the theoretical and empirical development of Social Accounting Matrices (SAMS), they are not yet used in any systematic way in developing countries.

It is a highly flexible system which offers the advantage of taking into account production activities, flow-of-funds, the relations between employment, incomes and household expenditures, the origin and uses of public resources, and the nature and structure of foreign trade.

In its extended form, such a system is a means of representing the totality of national accounts within a single table or matrix.

MATRICES DE COMPTABILITE SOCIALE, COMPTABILITE NATIONALE  
ET PLANIFICATION ECONOMIQUE, par J.W. Mc GILVRAY

Bien que les matrices de Comptabilité Sociale aient connu depuis dix ans un progrès considérable au niveau de la théorie et des applications pratiques, elles ne sont pas utilisées de façon systématique dans les pays en développement.

C'est un système très souple qui présente l'avantage de prendre en compte outre les activités de production, les flux de capitaux, les relations entre l'emploi, revenus et consommation des ménages, l'origine et l'utilisation des ressources publiques et la nature et la structure des échanges avec l'extérieur.

Dans sa forme la plus achevée, ce système est un moyen de représenter en un seul tableau ou matrice la totalité des comptes nationaux.

IMPORT CLASSIFICATIONS IN THE SOCIAL ACCOUNTING MATRIX (SAM)  
by Michael WARD

The objective of this paper is to define the appropriate trade classifications that need to be considered in the "Rest of the World" account of a social accounting matrix (SAM). The purpose is to satisfy the information requirements for official policy decisions and operations at both the national and international level. The context of this problem is set specifically in relation to the various planning and development needs of less developed countries. These countries rely heavily on imports both directly and indirectly for the maintenance and improvement of national living standards.

The paper describes the common general format of the national accounts balances and their associated SAM derivatives. It outlines the SAM's objectives and suggests where, in an overall sense, imports should fit into the framework.

The paper briefly sets out the general uses of trade statistics and identifies the different policy options for which such data are normally required. It then discusses what alternative trade are normally required. It then discusses what alternative trade classifications exist and how they could be applied describing the various limitations of each coding procedure.

CLASSIFICATIONS DES IMPORTATIONS DANS LA MATRICE DE COMPTABILITE SOCIALE (SAM), par Michaël WARD

L'objectif de ce papier est de définir les classifications appropriées du commerce extérieur qui doivent être prises en considération dans le compte du Reste du Monde d'une matrice de comptabilité sociale (SAM). Il a pour but de satisfaire les besoins en informations nécessaires à la prise de décisions et à la conduite d'opérations politiques officielles aussi bien sur le plan national qu'au niveau international. Le contexte de ce problème est défini spécifiquement par rapport aux divers besoins de planification et de développement des pays moins développés. Ces pays dépendent de façon considérable des importations, à la fois directement et indirectement, pour le maintien et l'amélioration des niveaux de vie de leurs populations.

Le papier décrit le cadre commun général des équilibres des comptes nationaux et les SAMs qui leur sont associées. Il décrit dans les grandes lignes les objectifs des SAMs et indique, de façon générale, l'endroit du cadre où les importations devraient s'insérer.

Le papier présente brièvement les utilisations générales des statistiques du commerce extérieur et identifie les différentes options politiques pour lesquelles de telles données sont normalement nécessaires. Il discute ensuite des autres classifications du commerce extérieur existantes, et de la façon dont elles pourraient être utilisées, et décrit les diverses limitations de chaque procédure de codification.

## UTILISATION DES COMPTES NATIONAUX, par Jean NKUETE

Les utilisations des comptes nationaux présentées ici concernent la planification économique, la structure de financement et la politique monétaire.

L'exemple du Cameroun est utilisé pour illustrer le premier thème dont trois aspects sont développés : établissement d'un bilan - diagnostic du développement économique, quantification des objectifs économiques prioritaires et recherche d'une meilleure adéquation des ressources et des emplois.

Le second thème montre à travers le cas de la France, de l'Allemagne et du Cameroun comment une analyse des comptes consolidés des institutions financières renseigne sur la structure de financement et au-delà sur l'efficacité des instruments de la politique monétaire.

L'utilisation des tableaux d'opérations financières n'est qu'évoquée.

## THE USES OF NATIONAL ACCOUNTS, by Jean NKUETE

The uses of national accounts stated in the paper relate to economic planning, financing structure and monetary policy.

Three aspects of the first theme, illustrated by the example of Cameroun are developed : the setting up of an assessment and diagnosis of economic development, the quantification of the priority economic objectives and the search for a better adequation of resources and uses.

Through the cases of France, Germany, and Cameroun, the second theme shows how the analysis of financial institutions' consolidated accounts provides information about the financing structure and, beyond, about the efficiency of the tools of monetary policy.

The use of flow-of-funds accounts is only touched upon.

PATRIMOINE NATUREL ET DEVELOPPEMENT; PRINCIPES GENERAUX  
D'UNE REPRESENTATION QUANTIFIEE DU PATRIMOINE NATUREL  
ET SES RELATIONS A LA COMPTABILITE ECONOMIQUE,  
par Christophe A. DRAVIE et Jean-Louis WEBER

Le projet d'établissement de comptes du patrimoine naturel est une tentative pour présenter l'information sur l'environnement naturel (la faune, la flore, les milieux physiques -eaux, sols, air, ... - les écosystèmes, les espaces et leur utilisation ...) dans un cadre global incluant l'homme et ses institutions.

Un tel cadre articulé permet une représentation des objets constituant le patrimoine et de leurs relations multiples traduites en termes d'équilibres comptables. Le caractère élémentaire, et donc réducteur d'un tel modèle au regard de chaque catégorie vue séparément est largement contrebalancé par la description exhaustive du champ, qu'il permet en termes quantitatifs. Dans le système de comptes du patrimoine naturel, la variation d'une case quelconque implique logiquement une modification d'autres cases dans d'autres comptes. Ainsi, la comptabilisation de la variation d'un paramètre sur la forêt conduit, par le jeu des comptes de relations, à en enregistrer les contreparties - les conséquences - dans les comptes de l'eau, du sol, de l'air, de la faune, etc ...

Par ailleurs, cette structuration logique de l'information devrait permettre l'élaboration d'agrégats résumant les divers mouvements ayant affecté le patrimoine naturel.

Incluant l'homme et ses institutions, le système de comptes du patrimoine naturel est d'autre part articulé avec la comptabilité économique nationale. Celle-ci enregistre les aspects monétaires des actions humaines, donc les coûts de la gestion de l'environnement, mais aussi la valeur des prélèvements de ressources naturelles. Cette coordination avec l'information économique ne se limite pas aux données monétaires ; elle concerne tout autant l'information économique en quantités physiques sur l'exploitation des ressources naturelles, sur les consommations et pollutions des différentes activités, filières, procédés techniques.

A côté de l'économie, les comptes du patrimoine naturel peuvent enfin être reliés à la statistique socio-culturelle, qu'il s'agisse des données relatives à la démographie et à la santé des populations, à leur cadre de vie, à leurs loisirs, etc ...

Une telle coordination statistique facilite à l'évidence la prise en compte de l'environnement naturel par les décideurs, à côté des prévisions économiques. C'est une meilleure prise en compte des effets à moyen et long terme de l'activité humaine qu'ils autorisent.

NATURAL PATRIMONY AND DEVELOPMENT : GENERAL PRINCIPLES  
FOR QUANTIFIED FRAMEWORK OF NATURAL PATRIMONY AND ITS  
RELATIONSHIP WITH ECONOMIC ACCOUNTS,  
by Christophe A. DRAVIE and Jean-Louis WEBER

The project to establish a system of natural patrimony accounts is an attempt to present a country's environment (its flora and fauna, its water, air and soil resources, its ecosystems and space utilization practices) within a global framework which would include man and his institutions.

This framework allows the objects which constitutes the natural patrimony and their multiple interrelationships to be translated into accounting balances. The elementary, and thus reductive character of this model for each separate category is largely offset by the exhaustive overall quantitative description which it provides. In the system of natural patrimony accounts, varying any given cell logically implies concomitant modification of the cells of other accounts. For example, the modification of accounts to record a variation of one parameter concerning forest resources has an effect on the accounts involving water, air and soil resources, the fauna, etc.

Furthermore, this logical structuring of data should allow aggregates to be drawn up which summarize various movements which have had an effect on the natural patrimony.

The inclusion of man and his institutions in natural patrimony accounts implies a direct relation with the system of national accounts. This latter system not only records the monetary aspects of human actions and thus the cost of environmental arguments management, but also ascribes values to natural resource harvesting. This coordination with the system of national accounts would not be limited to monetary data alone ; natural patrimony accounts would also present, in physical terms, economic data concerning the exploitation of natural resources, the consumption and pollution of various activities, production networks and technical processes.

Apart from purely economic considerations, a system of natural patrimony accounts can be linked to socio-cultural statistics related to demographic questions, health and living conditions, leisure activities, etc...

In addition to the economic forecasts used in decision making, such statistical coordination makes it easier for administrators to take the natural environment into consideration. The system of natural patrimony accounts provides a better understanding of the medium-and long-term consequences of human activity.

FORMATION DES PRIX ET SYSTEMES DE COMMERCIALISATION  
par H. CUNG

Trois approches sont ici abordées concernant le problème de la formation des prix et les systèmes de commercialisation.

La première approche n'est autre que celle de la théorie néo-classique de l'équilibre économique. Elle est à la base du calcul économique classique. Le système de prix est censé traduire le fonctionnement optimal du système économique en regard d'une fonction d'utilité collective soumise à des contraintes de disponibilité des biens et services. Un tel système de prix est considéré comme système de prix de référence, auquel il faut confronter les prix observés, considérés, eux, comme des distorsions. L'approche consiste dès lors à analyser ces distorsions par rapport au système de prix frontières considéré, lui, comme système de références. L'analyse peut être poussée jusqu'au calcul des surplus et pertes réels des divers agents économiques.

La seconde approche procède d'une analyse structurelle du système productif à travers le tableaux d'échanges interindustriels de Léontief. En effet, on se base sur les relations de Léontief reliant les prix à la production dans les branches d'activité, les rémunérations unitaires des facteurs, et les coefficients structurels des matrices de Léontief. Ce qui permet de calculer les répercussions "mécaniques" de certains prix à la production sur les autres prix. D'un point de vue dual, les relations de Léontief permettent de calculer les productions nécessaires pour satisfaire une demande finale prédéterminée. Ces mécanismes peuvent alors être intégrés dans un modèle formulé autour d'un TES pour déterminer un équilibre Ressources = Emplois portant sur tous les produits. Ce qui permet d'évaluer les effets à un niveau global des politiques de prix.

Dans la troisième approche il est fait appel aux techniques d'investigations de l'analyse de filières. On cherche ici, à partir d'une segmentation de la demande finale en chaque produit, à mettre en évidence des filières fournissant chaque segment. Chaque filière est considérée comme un système économique autonome, ayant une finalité propre : satisfaire un segment de marché déterminé. L'analyse de filière consiste alors à identifier les éléments du système et les contraintes auxquelles ils sont soumis, et étudier les mécanismes de leurs comportements. On s'appuie pour cela sur l'étude des flux entre agents de la filière, sur l'étude des procédures de prise de décision. Ce qui permet notamment d'analyser les mécanismes de formation des prix.

PRICE FORMATION AND COMMERCIALISATION SYSTEMS, by H. CUNG

In this paper, three approaches are analyzed concerning the problems of price formation and commercialization systems.

First we study the price formation theory issued from the neo-classical equilibrium model and more precisely the methodologies used for measuring and analyzing the price distortions compared with an idealistic price system optimizing a social utility function.

In the second approach we examine two economic models based on Leontiev input-output matrix. One deals with impact on prices, the other allows the evaluation of price intervention effects at a macroeconomic level.

The third approach deals with commercialization system analysis. Different channels between the production and/or importation levels and the final consumption level are analyzed. This leads to the identification of the principal agents and of their functions. By that way it is possible to study the mechanisms of price formation at each agent level, and therefore to outline a price policy based on realistic constraints.

LE TABLEAU ENTREES SORTIES DU CAMEROUN 1976-1977  
par MM. OYONO, MINDZENG and SAHA

Le TES, en 9 secteurs d'activité économique, présenté ici est celui qui a servi de base pour les travaux du Vème Plan Quinquennal du Cameroun.

THE 1976-1977 CAMEROUN INPUT-OUTPUT TABLE  
by MM. OYONO, MINDZENG and SAHA

The input-output table presented in the paper, disaggregated into nine economic sectors, has been used as a basis for preparing the Fifth Five-Year Plan of Cameroun.



## TEACHING OF NATIONAL ACCOUNTS, by RANGANATH K.R. IYENGAR

National Accounts does not form a part of the traditional degree courses in Statistics offered by most universities. These courses do not serve the requirements of practicing statisticians but those of academicians. This paper highlights this lacuna, lists the efforts being made to redress the situation and discusses the contents that should comprise a course in National Accounts and proposes a draft curriculum for such a course accompanied by a list of texts and references.

L'ENSEIGNEMENT DE LA COMPTABILITE NATIONALE  
par RANGANATH K.R. IYENGAR

La comptabilité nationale ne fait pas partie des cours de statistique classiques dispensés par la plupart des universités. Ces cours ne répondent pas aux besoins des statisticiens praticiens, mais à ceux des universitaires. Ce papier met en lumière cette lacune, indique les efforts réalisés pour redresser la situation, discute des éléments qu'un cours de comptabilité nationale devrait inclure et propose un projet de programme d'études pour un tel cours, accompagné d'une liste de textes et de références.

POUR UN ENSEIGNEMENT PLUS EFFICACE DE LA COMPTABILITE NATIONALE  
par Parfait RALAMBOSON

La présente communication se propose d'attirer l'attention sur le fait que l'étude systématique et complète de la présentation matricielle d'un système de Comptabilité Nationale faite le plus tôt possible est nécessaire si l'on veut que l'étudiant puisse progresser rapidement et facilement dans l'étude approfondie de cette discipline.

Après l'énumération des avantages à attendre de cette étude, une brève proposition d'aménagement des programmes d'enseignement est ensuite proposée.

TOWARDS A MORE EFFICIENT TRAINING IN NATIONAL ACCOUNTS  
by Parfait RALAMBOSON

The paper intends to draw the attention on the need to introduce as early as possible the systematic and comprehensive study of the matrix presentation of a National Account System, so that students can progress easily and rapidly into the in-depth study of that subject.

The paper then suggests briefly some modifications of training curricula.

ENSEIGNEMENT DE LA COMPTABILITE NATIONALE ET INITIATION A  
L'ECONOMIE - UN EXEMPLE DE METHODE ACTIVIE : L'ETUDE DE  
CAS "KANGARE"  
par NGO Thi Cuc et Jean-Louis WEBER

Traditionnellement, l'enseignement de la comptabilité nationale allie cours magistral, travaux dirigés et études de cas simplifiés. Alors que les deux premières méthodes - et le plus souvent, leur combinaison - constituent généralement l'ossature des programmes d'enseignement, les études de cas ne sont utilisées que de manière occasionnelle, pour illustrer telle ou telle partie d'un cours.

"Kangaré" est une tentative de structurer l'ensemble d'un enseignement de comptabilité nationale à partir de l'étude du cas d'un petit pays. La démarche est extrêmement progressive et les stagiaires (une quinzaine) passent par petites étapes d'une représentation chiffrée de schémas très simples aux enregistrements dans de véritables comptes et dans les tableaux de synthèse (Tableau entrées-sorties, tableau économique d'ensemble, tableau des opérations financières). Le stage dure 3 jours.

L'animateur guide le travail, présente les corrigés et donne des explications complémentaires en s'aidant d'un rétroprojecteur et d'un ensemble de transparents.

Conçu initialement pour la formation de cadres moyens de l'administration, le cas "Kangaré" est maintenant également utilisé, en totalité ou en partie, dans certaines Universités, en raison de son aptitude à fournir une introduction à la Comptabilité Nationale, mais également à la macro-économie.

TRAINING IN NATIONAL ACCOUNTS AND INTRODUCTION TO ECONOMICS  
AND EXAMPLE OF ACTIVE METHOD : THE "KANGARE" CASE STUDY  
by NGO Thi Cuc and Jean-Louis WEBER

Traditionally, training in national accounts combines lectures, workshops and simplified case studies. While the two first methods -and most often their combination- usually constitute the main structure of curricula, case studies are used only infrequently to illustrate some particular point in a lecture.

"Kangare" is an attempt to build up a comprehensive training course in national accounts from the case study of a small country. The process is very gradual and trainees (about 15) progress by successive steps from the quantified representation of very simple diagrams to full-size accounts and synthesis tables (input-output table, overall economic table, flow-of-funds table). The training lasts three days.

The lecturer gives guidance, solutions and additional explanations with the help of an overhead projector and transparencies.

The "Kangare" case study was originally conceived for training junior executives in the administration. It is now also used, totally or in part, in some universities because of its capability to provide an introduction to national accounting as well as to macro-economics.

UNIVERSITY EDUCATION IN NATIONAL ACCOUNTING  
par G. WALABYEKI-KIBIRIGE

National accounting education at university level is far from being satisfactory despite the need for national accounting professionals in statistical offices.

Teachers trained in this discipline are few ; appropriate textbooks are lacking and, generally, university education in statistics is too theoretical.

One possible solution would be to incorporate courses in applied statistics into university curricula.

If university is regarded as not suitable for this type of training, another solution consists in resorting more the regional statistical institutes.

L'ENSEIGNEMENT DE LA COMPTABILITE NATIONALE A L'UNIVERSITE  
par G. WALABYEKI-KIBIRIGE

Face aux besoins existant des services statistiques africains en comptaibles nationaux expérimentés, l'enseignement de la comptabilité nationale au niveau universitaire en Afrique est insuffisant.

Il existe peu d'enseignants formés à cette discipline, les manuels appropriés sont rares et d'une façon générale l'enseignement de la statistique dans les universités est conçu de façon trop théorique.

Une solution pourrait être d'inclure dans les programmes des universités des cours de statistique appliquée.

Une autre solution consiste, si l'on considère que ce type de formation ne relève pas de l'université, à s'appuyer davantage sur les Instituts régionaux de statistique.

PRACTICAL ASPECTS OF TRAINING IN NATIONAL ACCOUNTS WITH  
PARTICULAR REFERENCE TO DEVELOPING COUNTRIES,  
by Uma Datta ROY CHOUDHURY

Study of national accounts is not only essential in courses on macro-economics but is important for fruitful economic policies of the government. For developing countries the problems of organising such courses get multiplied because even the formulation of meaningful systems of national accounts for these countries is important and the absence of basic data makes the measurement difficult. A good training in national accounts is therefore pertinent to better measurement of national accounts for the country.

The work of national accounts estimation is generally undertaken within the government machinery. Also, national accounts being a comprehensive measurement, its estimation demands use of data on all different economic activities from all different sources. Quality of the measures of national accounts is heavily dependent on the quality of basic data. A background training in concepts of national accounts etc. for the employees in different government departments collecting/handling data is therefore desirable to help them to appreciate better the purpose of their exercise and even help them to plan better the collection of information in different fields. Similarly training of policy makers in basics of national accounts would assist them in interpreting the results more meaningfully.

The course contents of the training in national accounts would therefore have to be formulated differently for different groups according to their educational background and the jobs in which they are employed. The courses for employees connected with collection/measurement/interpretation will have to be more practically oriented and substantially different from those for university students. The appendices at the end of the paper spell out the details of the course content for different groups of students either from the university or from government departments/private enterprises connected with data collection.

ASPECTS PRATIQUES DE LA FORMATION A LA COMPTABILITE NATIONALE,  
PARTICULIEREMENT EN CE QUI CONCERNE LES PAYS EN VOIE DE  
DEVELOPPEMENT, par UMA DATTA ROY CHOUDHURY

L'étude de la Comptabilité Nationale est non seulement fondamentale pour les cours de macro-économie, mais elle s'avère également importante pour la réussite des politiques économiques des gouvernements. S'agissant des pays en voie de développement les problèmes de l'organisation de tels cours s'en trouvent multipliés, parce que la formulation même de systèmes pertinents de Comptabilité Nationale pour ces pays est importante, et que l'absence de données fondamentales rend la mesure difficile. Une bonne formation à la Comptabilité Nationale est ainsi nécessaire pour une meilleure mesure des comptes nationaux du pays.

Le travail d'estimation des comptes nationaux est généralement réalisé dans le cadre de l'appareil administratif. La Comptabilité Nationale étant une mesure globale, son estimation nécessite l'utilisation de données sur l'ensemble des diverses activités, provenant de toutes sortes de sources différentes. La qualité des mesures des comptes nationaux dépend de façon importante de la qualité des données de base. Il est donc souhaitable de donner aux employés des différentes administrations qui collectent et traitent des données, une formation de base sur les concepts de la comptabilité nationale pour les aider à mieux apprécier le but de leur travail, et même pour leur permettre de mieux planifier la collecte d'informations dans différents domaines. Pour les décideurs, une formation similaire aux principes de base de la Comptabilité Nationale les aiderait à interpréter les résultats d'une façon plus pertinente. Le contenu des cours de formation à la comptabilité nationale serait alors formulé de manière différente pour différents groupes en fonction de leur niveau de formation et du travail qu'ils effectuent. Les cours destinés aux employés qui s'occupent de la collecte, de la mesure, de l'interprétation des données devront être plus orientés vers la pratique et substantiellement différents de ceux destinés aux étudiants d'université. Les annexes à la fin du papier présentent en détail le contenu des cours pour les différents groupes d'étudiants provenant de l'université, des administrations ou des entreprises privées qui s'occupent de la collecte des données.

PRESENT STATE OF NATIONAL ACCOUNTS IN AFRICA AND ECA's PLANS AND  
RECOMMENDATIONS FOR ITS DEVELOPMENT IN THE IMMEDIATE FUTURE,  
by A.E. CUMMINGS PALMER AND K.N.C. PILLAI

National accounts work gained considerable momentum in most African countries since independence. At least 43 African countries are presently submitting national accounts data to the United Nations. Of these, at least two-thirds are following the present SNA. Some of the important SNA tables like (1) Expenditure on GDP (2) National Income and National Disposable Income, (3) Capital Transactions of the Nation, (4) GDP by kind of Economic Activity, (5) Domestic Factor Incomes by kind of Economic Activity and (6) Gross Capital Formation are compiled by most of the reporting countries.

However, the Statistical basis of the estimates for most of the countries of the region remains even now very weak, seriously affecting the reliability of the estimates. Besides, there is considerable time lag in compiling the estimates in many cases. The necessity of improving the quality and quantity of available basic statistics cannot be overemphasized if national accounts statistics are to be developed further and made more useful for policy formulation.

The ECA has formulated, within the limited funds available to it, certain proposals to assist the African countries in building up their capability for compiling more timely and useful national accounts. These proposals comprise essentially periodic advisory missions, assistance in basic data collection and compilation of national accounts and training seminars/workshops with added emphasis on on-the-job training for developing the expertise of national statisticians in both basic data collection and compilation of accounts.

SITUATION ACTUELLE DE LA COMPTABILITE NATIONALE EN AFRIQUE  
PROJETS ET RECOMMANDATIONS DE LA CEA EN VUE DE SON ETABLIS-  
SEMENT DANS UN PROCHE AVENIR, par A.E. CUMINGS PALMER AND K.N.C. PILLAI

L'établissement de la Comptabilité Nationale s'est considérablement accéléré dans la plupart des pays africains depuis leur accession à l'indépendance. Quarante-trois pays africains au moins fournissent actuellement des données de comptabilité nationale à l'ONU dont les deux tiers au moins ont recours au système de comptabilité nationale actuel. Quelques-uns des importants tableaux du SCN, à savoir 1) emploi du PIB, 2) revenu national et revenu national disponible, 3) opérations en capital de l'Etat, 4) PIB par genre d'activité économique, 5) revenu de facteurs de la production intérieure par genre d'activité économique et 6) formation brute de capital, sont présentés par la plupart des pays soumettant un rapport.

Cependant, la base statistique des estimations fournies pour la plupart des pays de la région reste très faible, ce qui compromet de façon sérieuse la fiabilité des estimations. En outre, dans nombre de cas, il intervient un retard considérable dans leur établissement. On ne saurait exagérer la nécessité d'améliorer la qualité et la quantité des données statistiques de base disponibles visant à développer les données statistiques relatives à la comptabilité nationale et à les rendre plus utiles à la formulation de politiques.

La CEA a formulé, dans la mesure de ses modestes moyens, des propositions tendant à aider les pays africains à renforcer leur aptitude à établir à temps des comptes nationaux plus utiles. Ces propositions portent essentiellement sur l'organisation de missions de consultation périodiques, l'assistance en matière de collecte de données de base et d'établissement de comptes nationaux ainsi que sur l'organisation de journées d'étude mettant l'accent sur la formation en cours d'emploi en vue de la mise en valeur des compétences des statisticiens nationaux aussi bien dans le domaine de la collecte de données de base que dans l'établissement des comptes



TRAITEMENTS AUTOMATIQUES DES COMPTES NATIONAUX :  
L'EXPERIENCE CAMEROUNAISE,  
par Samuel NOUMSI

Au Cameroun, la Déclaration Statistique et Fiscale (D.S.F.) remplie par les entreprises non forfaitaires fait l'objet d'un traitement informatisé qui rend possible la production régulière et rapide de résultats fiables et détaillés.

Le Secrétariat Permanent du Plan Comptable à Yaoundé centralise les D.S.F., assure les travaux de contrôle et de codification avant transmission au service informatique.

La saisie et le traitement informatique des données permettent la création et la mise à jour des fichiers de base (fichier des données de référence d'entreprise, fichier des fiches synthétiques d'entreprise, fichier des D.S.F.), la sortie des comptes sectoriels, des comptes de produits et du T.E.S.

AUTOMATED PROCESSING OF NATIONAL ACCOUNTS :  
THE EXPERIENCE OF CAMEROUN  
by Samuel NOUMSI

In Cameroun the Statistical and Tax Return (Déclaration Statistique et Fiscale) filled in by enterprises non submitted to fixed taxation is subjected to computerized procession which allows a steady and rapid production of detailed and reliable results.

The Secrétariat Permanent du Plan Comptable in Yaoundé centralises the Statistical and Tax Returns, undertakes the controlling and coding tasks before passing them on to the data processing department.

Data transcription and processing enable basic data files to be created and updated : Enterprise Reference Data File (fichier des données de référence d'entreprise), Enterprise Synthetic Data Card File (fichier des fiches synthétique d'entreprise), statistical and Tax Return File (fichier des Déclarations Statistiques et Fiscales) ; they also allow the compilation of sectorial accounts, product accounts and input-output tables.

LA COMPTABILITE NATIONALE EN AFRIQUE, EXPERIENCES NATIONALES,  
PROBLEMES ACTUELS ET FUTURS  
par Thomas KOMGUEP

Après un bref rappel sur l'importance de la Comptabilité Nationale en Afrique comme instrument privilégié d'information et de décision économique et sur les problèmes rencontrés pour la mise en place de cet outil dans les différents Etats, l'auteur prend pour exemple l'expérience camerounaise.

Depuis 1964, date à laquelle commencent les premiers travaux, le système mis en place au Cameroun a beaucoup évolué avec l'introduction du SCN version révisée en 1970.

La Comptabilité Nationale camerounaise s'appuie sur une structure institutionnelle solide et un large éventail d'informations parmi lesquelles il faut citer la Déclaration Statistique et Fiscale qui fait l'objet depuis 1973 d'un traitement informatisé.

Malgré certaines difficultés ponctuelles de fonctionnement et certains problèmes techniques non résolus, les perspectives d'ensemble sont encourageantes.

NATIONAL ACCOUNTING IN AFRICA, NATIONAL EXPERIENCES,  
PRESENT AND FUTURE PROBLEMS  
by Thomas KOMGUEP

The paper first recalls briefly the importance of national accounting in Africa, as a privileged device for providing information and for economic decision making, and the problems encountered in various countries in the implementation of this tool. It then takes the experience in Cameroun as an example.

Work started in 1974. Since then the system implemented in Cameroun has much evolved with the introduction of the 1970 revised version of the SNA.

National accounts in Cameroun rest on a sound institutional structure and a wide range of data sources. Prominent among them is the Statistical and Tax Return (Déclaration statistique et fiscale) which is subjected to computerized processing since 1973.

Despite some minor operating difficulties and unresolved technical problems, overall prospects are encouraging.

L'EXPERIENCE SENEGALAISE EN MATIERE DE COMPTABILITE NATIONALE  
by Awa THIONGANE

Les travaux de Comptabilité Nationale au Sénégal remontent à la période d'avant l'Indépendance. Depuis 1959, il est établi sur chaque année, des comptes économiques du Sénégal.

Les comptes portant sur les années antérieures à 1973 sont établis selon le système de comptabilité nationale français adapté par COURCIER aux pays tropicaux. Dans le temps, ces comptes se sont améliorés avec l'élargissement progressif du champ couvert par les statistiques de base.

Les comptes portant sur les années postérieures à 1973 (il n'y a pas de comptes de 1973) présentent deux caractéristiques qui les différencient des précédents :

- i) ils reposent sur des statistiques de base plus fiables et portant sur un champ beaucoup plus important.
- ii) ils sont établis suivant une méthode qui combine l'ancien et le nouveau système français de comptabilité nationale ainsi que le SCN.

L'expérience sénégalaise de comptabilité nationale repose sur une longue pratique. Le talon d'Achille reste l'insuffisance - voire l'inexistence - d'une information de base fiable et exhaustive sur la petite production en milieu rural comme en milieu urbain.

NATIONAL ACCOUNTS : THE SENEGALAISE EXPERIENCE  
by Awa THIONGANE

National accounts works were carried out in Senegal before Independence. Since 1959, Senegal National Accounts are compiled every year.

Before 1973, National Accounts are compiled following the former French System of National Accounts adapted to tropical countries by COURCIER. With time, these accounts were improved by progressive extension of data collection.

After 1973, - National Accounts were not compiled for year 1973 - two major changes can be identified :

- i) - the basic statistics used for National Accounts compilation are more reliable and offer a better coverage of the national economy
- ii) - the method used in compiling them combines both former and present French System of National Accounts as well as the present UN SNA.

Senegal has now a pretty long experience in National Accounts. Its Achilles' Heel remains the weakness - and some times the non availability - of reliable and exhaustive basic information on rural as well as urban informal sector.

PROBLEMS OF NATIONAL ACCOUNTS ESTIMATION IN ZIMBABWE :  
ACTUAL AND FUTURE,  
by Uma Datta ROY CHOUDHURY

In this paper, the author proposes to look at the sources of data used in compiling the tables on National Income regularly produced by the Central Statistic Office of Zimbabwe - those tables are :

- (1) the Gross Domestic Product at Factor cost by Industry of origin ;
- (2) the Expenditure on Gross National Product at Market Prices, including Gross Fixed Capital Formation and Private Consumption Expenditure.

For each item in the tables, the scope, coverage and reliability of data are discussed. The methods used for estimation and their weaknesses are explained.

Data on the modern sector is relatively sound but the author stresses the need to extend coverage to the informal sector and briefly indicates the future programme for improving the supply of basic data.

LES DIFFICULTES DE LA COMPTABILITE NATIONALE AU ZIMBABWE :  
PRESENT ET FUTUR,  
par Uma Datta ROY CHOUDHURY

Dans ce texte, l'auteur propose d'examiner les sources utilisées pour confectionner les tableaux du Revenu National régulièrement produits par le Service Statistique Central du Zimbabwe. Ces tableaux sont :

- (1) le produit intérieur brut au coût des facteurs, par branche d'origine ;
- (2) les Emplois du Produit National Brut aux prix du marché y compris la formation brute de capital fixe et la consommation privée.

Pour chaque case des tableaux, le champ, la couverture et la fiabilité des données sont abordés. Les méthodes d'estimation et leurs faiblesses sont exposées.

L'information sur le secteur moderne est relativement solide mais l'auteur insiste sur la nécessité de couvrir le secteur informel et indique brièvement le programme futur destiné à améliorer la fourniture de données de base.

PRESENTATION DU SYSTEME IVOIRIEN DE COMPTABILITE NATIONALE  
par Daho BAKARY

Ce papier constitue une présentation du système de comptabilité nationale utilisé en Côte d'Ivoire. Il en présente d'abord les cadres, en insistant sur les principaux tableaux élaborés : T.E.S. (tableau entrées-sorties), T.E.E. (tableau économique d'ensemble) et T.O.F. (tableau des opérations financières).

Puis il expose les sources statistiques les plus importantes et fait état des principaux problèmes rencontrés dans l'élaboration des comptes. Les problèmes de personnel sont cités en premier lieu, puis vient le manque, ou la mauvaise qualité, d'information concernant par exemple le secteur non structuré, les opérations des ménages et les marges commerciales.

Enfin, il est signalé qu'une structure de normalisation comptable vient d'être mise en place, qui devrait contribuer à résoudre les problèmes d'informations comptables relatifs aux banques et aux assurances.

PRESENTATION OF THE IVORY COAST NATIONAL ACCOUNTING SYSTEM  
by Daho BAKARY

The paper introduces the system of national accounts used in Ivory Coast. The accounting framework is presented first, emphasizing the major compiled tables : Input-Output Table, Overall Economic Table (tableau économique d'ensemble), and Flow-of-Funds Table.

It then exposes the major problems encountered when compiling the accounts. Staffing problems are mentioned first, followed by the lack or poor quality of information relating, for example, to the informal sector, household operations and trade margins.

Eventually, it is stated that a structure of accounting standardization has just been implemented. It would help to resolve accounting data problems related to banks and insurance companies.

TEXTE INTEGRAL DES COMMUNICATIONS DANS LA LANGUE ORIGINALE

*INTEGRAL TEXT OF THE PAPERS IN THEIR ORIGINAL LANGUAGE*

Session 1

## LE SECTEUR NON STRUCTURE DANS LES COMPTES NATIONAUX

### L'expérience de la Tunisie

Par Jacques CHARMES

Dans les pays du Tiers-Monde, l'artisanat de production et de services, ainsi que le petit commerce -le secteur "non structuré" pour employer un terme générique aujourd'hui couramment utilisé- représentent des activités dont il est difficile d'imaginer qu'elles puissent être tenues pour négligeables dans la comptabilité nationale.

Précisément, en l'absence d'enquêtes spécifiques, la méthode de prise en compte retenue est une méthode indirecte qui évalue la contribution de l'artisanat de production par solde à partir des consommations intermédiaires, la contribution de l'artisanat de services à partir de données pas toujours très rigoureuses sur l'emploi et les revenus, le commerce étant évalué en appliquant les taux de marge aux productions et aux importations.

Ces méthodes indirectes ont généralement eu pour résultat de faire apparaître la contribution du secteur artisanal à la production comme relativement importante, et de susciter le lancement d'une première génération d'enquêtes sur l'artisanat.

S'il n'est pas douteux que les méthodes directes par voie d'enquêtes sont toujours préférables aux méthodes indirectes, on pouvait néanmoins légitimement être amené à se demander si l'importance des moyens nécessités par la mise en oeuvre de telles enquêtes spécifiques, en valait la peine. Plusieurs raisons poussaient en ce sens :

- tout d'abord le secteur artisanal et le petit commerce sont, par nature, rebelles à l'appréhension statistique. Et ils le sont d'autant plus qu'il n'est pas fait d'effort pour adapter les concepts et méthodes d'enquêtes aux réalités spécifiques de ces activités économiques ;

- de ce fait, la contribution du secteur saisie par voie directe a pu se révéler moins importante que son estimation par voie indirecte ;

- enfin, les progrès de l'industrialisation étaient censés faire passer au second plan des activités considérées comme traditionnelles et donc signes antinomiques du progrès.

Aussi, après la période qui voit le lancement d'enquêtes sur l'artisanat dans un assez grand nombre de pays, l'enthousiasme retombe et l'on en revient aux anciennes méthodes d'estimation indirecte (utilisant toutefois certains résultats acquis par les enquêtes), quand on n'en vient pas à négliger purement et simplement la contribution de ce secteur.

Cependant, à partir du milieu des années 70, l'importance de l'exode rural et de la croissance urbaine va sensibiliser les planificateurs aux problèmes de l'emploi, et comme les enquêtes sur l'emploi ou les recensements de population ne débouchent pas sur les taux de chômage très élevés qu'on attendait, on en déduit qu'il existe toute une frange de la population qui est employée (ou sous-employée) dans un secteur que l'on qualifie de "non structuré" en partie parce qu'on l'a négligé jusqu'alors. Cette fois-ci, c'est sous l'angle de l'emploi qu'est appréhendé le secteur ; le comptable national reste provisoirement à l'écart de cette seconde génération d'enquêtes sur le secteur non structuré d'autant plus que l'on prétend que les emplois dans ce secteur, pour être en nombre très important, n'en sont que moins productifs : n'est-ce point d'ailleurs les adeptes de la théorie du chômage déguisé et du sous-emploi qui ont débusqué ce nouvel acteur du développement (ou du sous-développement) ?

Du fait même de leur origine, ces enquêtes sur le secteur non structuré restent limitées aux grands centres urbains, et continuent d'utiliser des concepts et des méthodes classiques et donc inadéquats, deux facteurs qui occultent l'importance de la participation du secteur non structuré à la formation du Produit National.

Et c'est ce qui fait l'originalité du système d'enquêtes mis en place par l'Institut National de la Statistique de Tunisie que d'avoir généralisé ce type d'enquête à l'ensemble du territoire national, tout en adaptant les méthodes et concepts à des situations très diverses, en vue d'intégrer le secteur non structuré dans des comptes nationaux qui l'avaient entièrement négligé jusqu'alors.

La comptabilité nationale a en effet suivi en Tunisie les diverses étapes de l'évolution générale qui vient d'être rapidement retracée.

Les premiers travaux de comptabilité nationale y remontent à 1953 - 1957, mais c'est véritablement au cours des années 1960-69 que sont élaborés les premiers comptes nationaux dignes de ce nom. La production des branches qui comportent des activités de type artisanal est alors estimée globalement (lorsqu'on ne connaît pas la part qui revient spécifiquement à l'industrie : confection, bois et ameublement ...), ou en distinguant l'activité artisanale (textile, réparation mécanique ...). La méthode consiste à évaluer la production à partir des consommations intermédiaires (textile-confection ...), des consommations finales (métaux précieux, restauration ...), ou encore des effectifs et du revenu moyen (réparation mécanique).

Sur le plan de la politique économique, la décennie 1960-69 se caractérise par un développement des coopératives, et une diminution de la part de l'artisanat à leur profit. C'est précisément de cette période que datent les enquêtes Artisanat de 1963 et de 1969.



Inversement, la période qui s'ouvre à partir de 1970 et qui se prolonge jusqu'à 1980, se caractérise, en réaction à la période précédente, par une politique libérale de "laisser-faire" qui entraîne une croissance exceptionnelle du nombre d'établissements et d'emplois dans ce que l'on va bientôt appeler le "secteur non structuré".

Cette politique délibérée de la part des pouvoirs publics fait qu'un certain nombre de réglementations plus ou moins contraignantes (en matière fiscale, sociale, etc.) tombent en désuétude, facilitant ainsi une telle croissance qui devient à la fois incontrôlée et ignorée, dans la mesure où, en l'absence d'enquêtes, seules les sources administratives (fiscales notamment) permettraient d'avoir une idée de l'importance du secteur artisanal. Ainsi, dans la période même où ce secteur prend une importance considérable, la comptabilité nationale et la statistique en général sont atteintes de cécité à son égard. Les comptes nationaux sont alors élaborés à partir des seules statistiques industrielles dans le secteur secondaire, et de façon très approximative dans le secteur tertiaire que l'on fait croître au rythme moyen de l'ensemble de l'économie sur la base des évaluations de 1960-64.

C'est pourquoi, lorsque sont connus les résultats de l'enquête sur le secteur non structuré de 1976-78 -d'abord lancée dans l'optique du Programme Mondial de l'Emploi- c'est une véritable révélation que confirment d'ailleurs les recoupements avec les résultats du Recensement de la Population et de l'enquête Budget-Consommation de 1975 : révélation qui va se traduire par le renouvellement et la généralisation de cette enquête en 1981-82, en vue d'intégrer, de façon permanente, le secteur non structuré dans les comptes nationaux.

Ainsi peut-on espérer passer d'une comptabilité nationale tronquée qui a masqué ce développement "sauvage", à une comptabilité nationale vérifiable, instrument d'un nouveau libéralisme contrôlé.

# I - DEFINITION DU "SECTEUR NON STRUCTURE" ET CONDITION DE SON INTEGRATION DANS LES COMPTES NATIONAUX

## 1- Définition

"Non structuré" ou "Informel" ne signifie évidemment pas "non organisé". Comme on s'en doute, toute activité qui se caractérise par une certaine expansion, ou qui subsiste tout simplement, est organisée.

Non structuré ne veut pas dire non plus coupé de, sans relation avec le secteur "moderne" de l'économie. C'est sur ce sujet qu'ont lieu les discussions les plus byzantines sur le dualisme dont serait entaché le concept. Il est évident qu'il existe un lien fonctionnel entre les deux secteurs, en ce sens que le secteur non structuré assure une reproduction à bon marché de la force de travail, et est ainsi "nécessaire" à la reproduction du secteur moderne (ou à l'accumulation qui s'y développe). Mais c'est là le type même de la thèse non falsifiable dont parle Karl Popper ; la proposition est tellement générale qu'elle est obligatoirement vérifiée : si le secteur non structuré existe, c'est bien évidemment parce qu'il remplit un tel rôle.

En fait, le concept de secteur non structuré est l'instrument d'une démarche purement empirique : est "non structuré" ou "informel" tout ce qui n'entre pas dans les cadres (les structures, les formes) institutionnels légaux de l'activité économique, et donc par voie de conséquence tout ce qui n'est pas saisi dans les cadres classiques de la statistique et de la comptabilité nationale : c'est précisément le solde que l'on va tenter d'appréhender directement par voie d'enquête.

Il en résulte une très grande hétérogénéité des activités concernées et de leurs modalités d'exercice et la nécessité d'adopter les méthodes d'appréhension spécifiques à chaque type d'activité (1). Les conditions nécessaires à l'appréhension du "solde" vont nous permettre de revenir sur cette diversité.

## 2- Les trois conditions nécessaires à l'appréhension du "solde" par voie d'enquêtes directes

Sous peine de n'aboutir qu'à repousser la limite à partir de laquelle le calcul par solde devient nécessaire, l'enquête sur le secteur non structuré se doit d'être :

- nationale et exhaustive ;
- estimative de la production ;
- périodique.

### a) L'enquête doit être nationale et exhaustive

Nous avons déjà dit que la plupart des enquêtes sur le secteur non structuré réalisées en Afrique, sous l'égide du BIT notamment, s'étaient cantonnées aux capitales. Il en résulte une impossibilité de généralisation à l'ensemble du territoire national, étant donné que l'importance du secteur non structuré dans l'emploi total n'est pas connue et que par ailleurs les structures de production ou de prix peuvent être extrêmement différentes d'une région à l'autre.

La réalisation de l'enquête au niveau national est donc une condition indispensable à l'intégration du secteur non structuré dans les comptes nationaux. Mais ce n'est pas une condition suffisante. En effet, l'exhaustivité de l'investigation peut ne pas être assurée, puisque par nécessité l'enquête ne peut porter que sur les établissements économiques qui sont parfaitement localisés. Or des activités de type artisanal tout aussi peu négligeables s'exercent de façon ambulante, itinérante ou non sédentaire (BTP notamment), ou encore à domicile (tissage-confection). La difficulté qu'il y a à localiser ces activités, qui changent constamment de place ou qui ne sont pas visibles de la voie publique, oblige à procéder à des investigations indirectes. La seule façon de saisir ces activités étant les enquêtes auprès des ménages, et celles-ci ne pouvant se limiter à ces seules catégories (2), seule une démarche comparative dont nous exposerons plus loin la méthode, permet d'assurer l'exhaustivité de l'investigation.

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(1) Nous ne reviendrons pas ici sur la typologie de ces activités présentée dans : J. CHARMES : "L'analyse du secteur non structuré à travers les sources de données sur l'emploi". STATECO n° 26, juin 1981, pp. 42-85.

(2) Puisqu'une enquête auprès des ménages ne peut guère procéder autrement que par sondage aréolaire.

b) L'enquête doit permettre d'aboutir à une estimation globale de la production

Si la réalisation de l'enquête au niveau national permet d'assurer une bonne représentativité de l'échantillon tiré, encore faut-il veiller à la complémentarité des sources : dans chaque branche, on peut en général distinguer grosso modo trois catégories d'entreprises ou d'ateliers, selon les modalités d'exercice :

- les entreprises modernes qui, généralement, tiennent une comptabilité conforme au Plan Comptable (même si certains de ses éléments laissent à désirer) et dont les documents comptables (bilans) font assez souvent l'objet d'une exploitation régulière et systématique ;

- les ateliers artisanaux qui ne tiennent pas de comptabilité, traditionnellement définis d'après un critère de taille (moins de 10 emplois par exemple), et sur lesquels portent en général les enquêtes artisanat classiques ;

- l'artisanat à domicile qui relève de l'unité d'observation ménage et non plus entreprise.

Généralement, on constate une absence d'harmonisation dans les définitions du secteur moderne et de l'artisanat, donnant lieu à des investigations séparées et rarement coordonnées. D'où le risque de double compte (entreprises de moins de 10 emplois tenant une comptabilité et déjà prises en compte dans l'exploitation des bilans) ou d'exclusion (entreprises de plus de 10 emplois ne tenant pas de comptabilité).

D'autre part, les enquêtes artisanat incluent quelquefois dans leur champ le travail à domicile, mais le mélange des genres entre entreprises et ménages n'est pas un gage d'exhaustivité.

Tous ces problèmes rendent difficile l'estimation de la production.

Estimation elle-même obérée par le défaut d'adaptation des méthodes et concepts servant à évaluer la production du secteur artisanal, et qui risquent de n'aboutir qu'à des déclarations fortement sous-estimées et peu crédibles.

Ainsi, l'estimation globale de la production implique-t-elle une harmonisation des définitions et une adaptation des concepts et méthodes d'observation.

c) L'enquête doit être périodique, car il n'est pas possible de considérer que le secteur non structuré représente toujours la même proportion de l'activité des branches dans toutes les conjonctures et quelle que soit l'évolution générale de l'économie. On peut même penser que ce véritable poumon de l'économie évolue plus vite que le secteur moderne dans les branches en expansion, et régresse plus rapidement dans les branches en crise. D'où la nécessité de procéder à des enquêtes sur le secteur non structuré, à date régulière, ne serait-ce que parce que la base de sondage devient rapidement caduque. Certes, la fréquence ne saurait être aussi forte que dans le secteur moderne, et il n'est pas possible d'envisager des enquêtes annuelles. La périodicité des recensements de population (10 ans) semble trop longue mais elle peut être acceptable à défaut d'une périodicité quinquennale qui semble mieux adaptée à ce genre d'investigation.

Certes, la réalisation d'un recensement d'établissements doit pousser à la mise en place d'un Fichier National des Entreprises et des Etablissements dont la mise à jour permettrait d'éviter le renouvellement trop fréquent de lourdes opérations censitaires. Cependant l'utilisation d'un fichier inter-administratif à des fins statistiques présente de nombreuses difficultés (l'expérience du fichier SIRENE en France le prouve) : particulièrement, dans le cas d'un pays comme la Tunisie, la partie "non structurée" du fichier se périmé extrêmement vite, sans que les sources autres que statistiques permettent d'y parer. Le renouvellement des recensements d'établissements est donc une nécessité qu'il n'est guère possible d'éviter et qui permet en outre de procéder à d'utiles comparaisons avec les données de recensements de population.

## II - LE SYSTEME D'ENQUETES MIS EN PLACE PAR L'INSTITUT NATIONAL DE LA STATISTIQUE POUR L'OBSERVATION DU SECTEUR NON STRUCTURE

Le concept -empirique- de secteur non structuré recouvre des situations très diverses qu'il ne peut être question d'appréhender de façon intégrée et unitaire, et que l'on peut classer en deux grandes catégories requérant des investigations spécifiques :

- les activités s'exerçant plus ou moins officiellement dans des locaux ou des établissements spécifiquement prévus à cet usage, constituent ce que l'on a appelé le secteur non structuré localisé et recouvrent le champ des enquêtes artisanat classiques ;

- les activités monétaires s'exerçant dans les domiciles ou de façon itinérante, épisodique ou clandestine, constituent le secteur non structuré non localisé.

Les premières relèvent de la statistique d'entreprises, alors que les secondes relèvent de la statistique comparative et de la statistique des ménages.

L'enquête tunisienne a naturellement mis l'accent sur la première catégorie d'activités, mais elle n'en a pas pour autant négligé la seconde qui, au moins pour ce qui concerne le nombre d'emplois, représente la partie cachée de l'iceberg (56,6 % de l'emploi dans le secteur non structuré).

Nous examinerons successivement les deux méthodes d'investigation.

### 1- Méthode d'analyse du secteur non structuré localisé

Le système d'enquêtes mis en place par l'Institut National de la Statistique de Tunisie pour l'étude du secteur non structuré localisé comprend trois volets : un recensement général des Etablissements, des monographies socio-économiques de métiers, des sondages sectoriels.

- Le Recensement Général des Etablissements est évidemment la clé de voûte du système puisqu'il permet de dénombrer précisément l'effectif des unités concernées, effectif rarement connu avec précision en raison du caractère généralement partiel des enquêtes industrielles, artisanales ou commerciales. Le fait de ne pas fixer a priori un critère de délimitation entre

artisanat et industrie, entre secteur non structuré et secteur moderne, autorise en effet la collecte à procéder à un ratissage géographique complet, par le porte à porte, en parcourant les flots dans toutes leurs dimensions (étages, sous-sols, arrière-cours, etc.).

Cette démarche exhaustive, qui s'est basée sur les travaux préliminaires de prédénombrement et de cartographie du Recensement de la Population de 1975, puis sur leur mise à jour lors de l'Enquête Population - Emploi 1980, présente deux difficultés : tout d'abord, il n'est pas toujours aisé de distinguer les établissements des domiciles ; en particulier lorsqu'une porte donnant sur la voie publique est fermée, on ne peut savoir a priori si elle ouvre sur un domicile ou un établissement, ce qui implique une multiplication des passages, ou une enquête de voisinage. En second lieu, le porte à porte implique que l'unité d'observation soit le local, à partir duquel il est nécessaire de reconstituer l'entreprise. Or l'une des caractéristiques du secteur non structuré est précisément d'éclater l'entreprise en multiples établissements qui passent plus facilement inaperçus.

L'expérience du Recensement des Etablissements de 1976 a permis, lors du renouvellement de l'opération en 1981, de tenir compte de ces difficultés : notamment grâce à la normalisation des adresses et des noms propres, on a pu constater qu'un nombre non négligeable de petits établissements faisaient partie intégrante d'une même entreprise appartenant à une seule et même personne. Dès lors, le critère de la taille (moins de 10 emplois/10 emplois et plus) perdait une partie de sa valeur quant à la délimitation du secteur non structuré, au profit du critère de comptabilité.

L'effectif de la main-d'oeuvre et sa composition (salariés, apprentis, aides familiaux, saisonniers), la tenue ou non d'une comptabilité avec bilan ou simplifiée, sont en effet des informations relevées dans le questionnaire du Recensement, parallèlement au nom ou à la raison sociale, à l'adresse et à l'activité normalisés.

Outre cet avantage d'aider à la détermination a priori du champ d'extension du secteur non structuré, le Recensement des Etablissements peut servir de base à la constitution d'un Fichier National des Entreprises, et permet également d'estimer les effectifs de main-d'oeuvre travaillant à domicile ou de façon clandestine, par une démarche comparative que nous examinerons ci-après, au paragraphe II.2.

- Les monographies socio-économiques de métiers représentent une contribution sociologique à l'investigation statistique. Dans l'enquête tunisienne, l'idée d'un questionnaire unique pour toutes les branches du secteur non structurée a, d'emblée, été écartée ; et le rôle des monographies a été, entre autres objectifs, de permettre l'élaboration de questionnaires statistiques adaptés aux réalités de chaque métier ou de chaque activité, en fournissant une connaissance qualitative préalable de ces réalités.

Procédant par entretiens au magnétophone d'un nombre restreint d'artisans, les monographies ne visent pas à l'extrapolation ; cependant les artisans interrogés, choisis par relation, sont censés représenter le plus grand nombre de cas possibles par rapport aux quelques caractéristiques connues comme pouvant être des facteurs de différenciation : activité, effectifs, composition de la main-d'oeuvre, localisation géographique.

Les monographies ont été réalisées dans les principales branches d'activité pour lesquelles le Recensement des Etablissements avait montré que les petites unités étaient dominantes, soit en nombre, soit en emplois. Il s'agit des branches Bois et Ameublement, Cuir et Chaussures, Métal-Fer forgé, Textile et Confection, Boulangerie et Pâtisserie, Mécanique-garages, métiers du Bâtiment (maçons, peintres, plombiers, ...), Autres services, etc.

Les méthodes d'évaluation de la production, de la valeur ajoutée et des bénéfices ont été testées au cours des entretiens monographiques : d'un entretien ou d'un artisan à l'autre, une question à visée quantitative dont la réponse n'avait pas été satisfaisante était posée sous une autre forme ou par un autre biais, après que les raisons invoquées par un précédent artisan pour justifier sa difficulté à répondre aient été soumises à l'artisan nouvellement interrogé. Ainsi par recoupements successifs et écueils sur des contradictions en chaîne, la réalité du comportement des petits ateliers s'éclairait progressivement et, par la même occasion, la forme des questions pertinentes.

Bien que la formalisation en un questionnaire statistique soit nécessairement appauvrissante, l'énumération des quelques principes qui ont présidé à sa mise en oeuvre permet de comprendre les méthodes de calcul des agrégats que nous exposerons au paragraphe III.2.

Le principe sans doute le plus important consiste à bien saisir le rythme de l'activité étudiée et à appuyer le questionnaire sur cette base solide. C'est en effet dans ce principe que réside la force du questionnaire, mais aussi sa difficulté.

Un autre principe consiste à tenir compte de la quantité du travail incorporée dans le produit fabriqué ou le service rendu par l'activité étudiée.

Enfin le dernier principe consiste à procéder à des raisonnements (et des relevés) en termes unitaires : unité de produit ou unité de temps, selon qu'il s'agit d'une production de biens ou d'une production de services.

- Les sondages sectoriels et l'Enquête Nationale sur les Activités Economiques se fondent sur les enseignements des monographies et sur les questionnaires qui en sont issus. Réalisés à titre expérimental sur les trois secteurs Bois-Ameublement, Réparation mécanique et Cuir et Chaussures entre 1976-1979, ils se sont fondus en 1982 en une vaste enquête multi-sectorielle portant sur près de 10 000 entreprises.

L'Enquête Nationale sur les Activités Economiques est exhaustive pour toutes les entreprises de 10 emplois et plus. En fait, elle correspond alors (tant sur le plan du questionnaire que sur les plans de la méthode et de l'exploitation des résultats) à des opérations plus anciennes, comme le Recensement des Activités Industrielles et l'Enquête sur le Commerce. Le questionnaire qui reprend alors simplement les éléments comptables détaillés (ainsi que des questions sur l'emploi), a été étendu aux services (1).

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(1) Professions libérales exclues : celles-ci s'étant montrées extrêmement réticentes à l'égard de toute enquête, y compris un simple recensement.

Le questionnaire moderne intitulé "Entreprises avec bilan" est donc relativement homogène dans ses versions Industrie, Commerce, Services.

Pour les entreprises de moins de 10 emplois, il est procédé à un sondage dont le taux varie en fonction des strates (activité, nombre d'emplois, localisation géographique), de façon à assurer la représentativité des principales branches d'activité et des régions géographiques.

Le questionnaire secteur non structuré, intitulé "Entreprises sans bilan" est donc posé, par enquête directe, auprès de cet échantillon. Ce questionnaire se caractérise dans ses trois versions (branches manufacturières, commerce, services) par un tronc commun (emploi et rémunérations, capital et investissements, charges diverses, opinion et divers), et une partie spécifique qui concerne l'évaluation du chiffre d'affaires et de la production (sur laquelle nous reviendrons ci-après).

Alors que, dans la phase expérimentale, on s'était efforcé d'élaborer des questionnaires spécifiques à chaque branche d'activité, on a voulu, dans l'Enquête Nationale, homogénéiser la démarche, ce qui impliquait par exemple que le tableau des coûts de production n'énumère pas au préalable les principales matières premières et consommations intermédiaires utilisées : il revenait à l'enquêteur d'en dresser la liste sur le tableau approprié, au moment du passage du questionnaire. De la même façon, le choix de la période de référence servant à établir le rythme de l'activité, est laissée à l'initiative de l'enquêteur, en fonction de l'activité sur laquelle porte son investigation.

Les précisions qui font ainsi défaut sur les questionnaires ont été reportées dans les manuels d'instructions aux enquêteurs, très détaillés, et une certaine spécialisation a été opérée entre les enquêteurs afin d'initier préalablement les équipes aux corps de métiers qu'elles allaient enquêter.

Il va sans dire que la limite moins de 10 emplois - 10 emplois et plus, n'a pas été choisie au hasard : outre le fait qu'elle fixait jusqu'alors le champ d'investigation du Recensement des Activités Industrielles, elle correspond nettement au passage d'une structure à une autre, d'après les résultats du Recensement des Etablissements. Jusqu'à 10 emplois, la proportion des salariés est toujours inférieure à 50 % des effectifs, cependant que la proportion des apprentis est toujours croissante et importante ; enfin, cette limite est la borne supérieure du seuil fiscal au delà duquel l'entrepreneur passe de l'imposition au forfait à l'imposition sur le chiffre d'affaires.

En tout état de cause, la forme du questionnaire (avec bilan/sans bilan) n'est pas contraignante et si l'on trouve, dans l'échantillon des entreprises de moins de 10 emplois, une entreprise qui tient une comptabilité, on lui soumettra le questionnaire avec bilan, et inversement, si parmi les entreprises de 10 emplois et plus, il en est qui ne tiennent pas de comptabilité, c'est le questionnaire secteur non structuré sans bilan qui leur sera soumis.

## 2- Méthode d'analyse du secteur non structuré non localisé

Tout comme dans le cas précédent, il s'agit ici d'estimer la contribution de cette fraction du secteur non structuré à la production. Il est donc nécessaire en premier lieu de dénombrer les travailleurs concernés, et en second lieu d'évaluer leur productivité.

- L'analyse comparative des sources de données sur l'emploi permet de dénombrer la population concernée. Nous avons déjà dit que le Recensement des Etablissements gagnait à être réalisé conjointement au Recensement de la Population afin d'en alléger la charge. Mais il y a un autre avantage à cette coïncidence dans le temps : c'est la possibilité d'en comparer les résultats.

En effet, il n'est pas de source plus exhaustive que le Recensement de Population. En particulier, le Recensement de la Population de 1975 a permis de mieux connaître le travail artisanal à domicile, en posant une question supplémentaire aux femmes qui s'étaient déclarées "au foyer", et donc "inactives". Cette méthode a permis de récupérer dans la population active un grand nombre de femmes, dans les branches du textile et de la confection (ainsi que dans l'agriculture).

Mais le secteur non structuré non localisé n'est pas uniquement composé de ces femmes au foyer ; il comprend aussi des travailleurs oeuvrant dans des ateliers clandestins ou itinérants (ou du moins situés de telle façon qu'ils échappent à la vigilance des enquêteurs), mais qui se déclarent actifs dans une enquête auprès des ménages, de la même manière que se manifestent des travailleurs qui n'ont pas été déclarés par leurs patrons lors du Recensement des Etablissements.

L'étude approfondie des résultats du Recensement de la Population (1) ne permet pas de dénombrer directement cette population flottante, mais son estimation est obtenue en retranchant de la population active totale les effectifs recensés dans les établissements.

- Les monographies socio-économiques sont, dans le cas du secteur non structuré non localisé, le seul moyen d'estimer la productivité des travailleurs concernés, du moins pour ce qui concerne le travail à domicile, car l'on peut faire l'hypothèse, sans grand risque de se tromper, que les travailleurs clandestins ou non déclarés ont une productivité très proche de celle du secteur non structuré localisé dans la branche correspondante.

Le travail à domicile ne peut évidemment être traité de la même manière, puisqu'il s'agit, nous l'avons déjà dit, de femmes au foyer donc ce n'est pas l'unique occupation, et qui peuvent donc consacrer un temps variable à l'activité de tissage ou de confection.

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(1) A défaut de Recensement de Population, on peut utiliser toute autre source censée être plus exhaustive, en particulier les Enquêtes sur l'Emploi auprès des Ménages, le niveau de détail des activités est alors sensiblement moins élevé, puisqu'il s'agit d'enquêtes par sondage.



La méthode idéale consisterait en l'occurrence à pratiquer un sondage statistique auprès des ménages. Mais cela s'avère impossible puisqu'on ne peut connaître la population-mère des ménages ayant un ou plusieurs de ses membres pratiquant une activité à domicile, avec suffisamment de précision pour qu'il soit possible d'en tirer un échantillon représentatif.

On ne peut donc que se baser sur les résultats du Recensement de la Population pour savoir si ces activités sont particulièrement développées dans telle et telle région géographique où l'on procèdera donc à des monographies qui présenteront cette particularité d'intégrer un questionnaire quantitatif simplifié permettant d'aboutir aux éléments recherchés, et notamment au temps consacré par jour, par semaine ou par mois au travail à domicile, la productivité par personne et par unité de temps étant peu variable.

Le problème est alors d'avoir un échantillon suffisamment représentatif pour être extrapolé : une solution pourrait être de faire réaliser de telles enquêtes légères par des étudiants originaires de la région. En l'état actuel des choses, l'enquête tunisienne s'est contentée d'un échantillon relativement restreint et choisi par relation.

### III - L'INTEGRATION DU SECTEUR NON STRUCTURE DANS LES COMPTES NATIONAUX :

#### PRINCIPES, METHODES, RESULTATS

##### 1- Principes

S'agissant d'appréhender des activités monétaires habituellement négligées par manque de connaissance, il n'est pas tant question d'adapter les cadres comptables à une réalité qui se situerait en-dehors, que d'adapter les méthodes et techniques de collecte afin de faire entrer cette réalité dans les cadres comptables préexistants.

Or la comptabilité d'entreprise, outil et source d'information très importants pour la comptabilité nationale, est un instrument au service du comportement de maximisation du profit, ou à tout le moins du revenu (pour les entrepreneurs individuels).

La proposition reste vraie, même lorsque ce revenu parvient tout juste à subvenir aux besoins de l'entrepreneur et de son ménage. Car si l'on constate généralement une absence de comptabilité dans le secteur non structuré (et pour cause, puisque c'est l'un des critères de définition), cette absence n'est jamais totale. Il existe la plupart du temps un embryon de comptabilité, même non écrite : par exemple, la méthode de fixation du prix en fonction du coût de la matière première ou du temps nécessaire. L'objectif des enquêtes sur le secteur non structuré est précisément d'élucider ces "manières de compter", et de convertir dans les termes des Plans comptables, cette comptabilité embryonnaire adaptée aux contraintes et au niveau des entrepreneurs du secteur non structuré.

##### 2- Méthodes

La clé qui permet d'opérer cette conversion est la connaissance du rythme de l'activité.

En effet, si le chiffre d'affaires annuel est bien un concept opératoire et significatif pour analyser l'activité d'un petit entrepreneur, si petit soit-il, il est clair toutefois qu'un tel concept n'a certainement pas -du moins pas souvent- une signification très évidente pour l'entrepreneur lui-même qui n'est soumis à aucun cycle annuel, pas même à celui de l'impôt auquel il échappe le plus souvent, et encore moins à celui de la comptabilité. Faute de ce minimum de signification concrète, l'entrepreneur ne peut répondre sur ce point, quelle que soit par ailleurs sa volonté. Le problème consiste donc à essayer de recenser les cycles auxquels il est soumis et qui déterminent en grande partie son comportement et finalement sa manière de compter car il s'agit bien d'aboutir en fin de compte à une quantification en termes monétaires. Ces cycles peuvent être multiples et interférer entre eux : c'est de leurs résultante que dépend le rythme de l'activité. Certains de ces cycles sont liés à l'activité elle-même : cycle saisonnier des commandes, cycle aléatoire des approvisionnements et des pénuries. D'autres sont liés au comportement de l'entrepreneur : cycle de l'apprentissage, cycle du stockage. Certains sont susceptibles de régulation : c'est le cas par exemple du cycle de l'apprentissage (1), c'est aussi celui du cycle des approvisionnements régulé par une politique de stockage que certains artisans peuvent se permettre, contrairement à d'autres à court de liquidités.

Dans la plupart des cas, l'absence ou la difficulté de régulation entraîne un raisonnement en termes unitaires :

- unité de fabrication (chambre à coucher pour l'ébéniste, révision de moteur pour le garagiste) ou multiple de cette unité dans le cas du travail en série (100 paires de chaussures ...) ;

- unité de temps : la semaine pour les fabricants de chaussures, les garagistes ou les petits commerçants.

La collecte des données dont l'agrégation ou l'extrapolation nous conduira aux éléments réputés opératoires du point de vue de la comptabilité nationale passera donc par l'observation détaillée des coûts et des temps de production unitaires dans le premier cas, par l'établissement détaillé sur une période d'un mois d'un calendrier hebdomadaire des opérations de production, de service ou de commerce et de leurs coûts. Dans les deux cas, les variations saisonnières de l'activité sont appréhendées de façon détaillée.

C'est donc un tel schéma qui a été suivi dans l'élaboration des questionnaires des enquêtes sur le secteur non structuré. En théorie, chaque branche d'activité requiert un questionnaire approprié. En fait, dans l'Enquête Nationale sur les Activités Economiques, par souci de simplification, et pour tenir compte des situations extrêmement diverses que l'on est susceptible de rencontrer au sein même d'une branche, on a opté pour 3 grands types de questionnaires : branches manufacturières, branches de service, et commerce, dans lesquels l'unité de temps n'est pas fixée, mais laissée au choix de l'enquête (le manuel d'instructions permettant aux enquêteurs de se familiariser avec les principaux comportements observés dans les diverses branches du secteur non structuré).

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(1) La main-d'oeuvre d'apprentis est souvent utilisée aux mêmes tâches que la main-d'oeuvre salariée, et certains artisans peuvent embaucher de nouveaux apprentis plusieurs mois avant le départ prévu de leurs apprentis formés. Cf. J. CHARMES (1980) : "Les contradictions du développement du secteur non structuré" - Revue Tiers-Monde, vol. XXI, n° 82, pp. 321-335.

L'expérience acquise lors des enquêtes monographiques, puis lors des enquêtes sectorielles pilotes nous ont donc amenés à mettre en oeuvre trois méthodes d'évaluation de la production ou du chiffre d'affaires :

- Chiffre d'affaires calculé par la consommation de matières premières.

Pour les branches productives (bois, cuir, métal, boulangerie), cette méthode consiste à reconstituer la valeur des achats des matières premières sur une année (ou sur une période significative que l'on extrapole à partir des variations saisonnières), à faire le rapport de cette valeur à la matière première contenue dans une unité du produit le plus couramment fabriqué (1) et à multiplier ce rapport par le prix unitaire de ce même produit.

Pour le commerce, il s'agit d'une estimation du chiffre d'affaires pour les achats.

- Chiffre d'affaires déclaré.

Le relevé par période significative de la production en volume ou en valeur (ou des ventes pour les services et le commerce), permet d'obtenir une déclaration directe, par application du coefficient de variations saisonnières.

- Chiffre d'affaires calculé par la capacité de production.

Pour tous les secteurs productifs, cette méthode consiste à attribuer un coefficient de productivité à chaque travailleur de l'atelier en fonction de sa qualification. Le coefficient de productivité de l'atelier ainsi obtenu est transformé en capacité de production en le multipliant par le nombre de jours travaillés. En rapportant à ce chiffre le temps de travail effectif (pondéré par la productivité) nécessaire à la fabrication du bien le plus courant, on obtient la production potentielle en volume, que l'on valorise par le biais du prix unitaire.

L'estimation finalement retenue est la plus forte des deux estimations les plus proches, puisqu'il y a alors un indice de cohérence dans les réponses.

Dès lors, les principaux éléments nécessaires à l'établissement des comptes d'agent et du tableau d'entrées - sorties peuvent être calculés : la structure des coûts unitaires est appliquée à la production en volume pour en déduire le montant des diverses consommations intermédiaires, cependant que les charges diverses, salariales ou fiscales ne posent pas de difficultés particulières.

Dans la plupart des cas, le niveau de détail obtenu n'a rien à envier au secteur moderne ; parfois même, il est plus grand et il est nécessaire d'agréger : en effet, étant donné que les relevés se font sur une

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(1) On obtient de cette manière une production en volume en équivalents du produit le plus courant.

unité de produit, ou sur une période de temps relativement courte, les consommations intermédiaires peuvent être très détaillées pour les nécessités de la collecte (le menuisier déclarera par exemple les diverses catégories de bois qu'il a achetées, le restaurateur énumérera tous les produits ou catégories de produits achetés au cours de la période de relevé) et dépasser le niveau de détail prévu dans la nomenclature des produits utilisée.

### 3 - Résultats

Il est encore prématuré de donner les résultats de l'Enquête Nationale sur les Activités Economiques, en cours de réalisation, mais les résultats des enquêtes pilotes menées dans les branches "Bois-Ameublement", "Cuir et Chaussures", "Réparation mécanique" donnent une bonne idée de l'importance des réajustements nécessaires. Les comptes nationaux de l'INS ont établi les comptes 1977 pour ces trois branches, en distinguant secteur non structuré et secteur moderne (1), selon la définition moins de 10 emplois/10 emplois et plus.

Le tableau suivant donne les principaux résultats de ces travaux pour les trois branches considérées sous leurs deux composantes :

Tableau : Chiffre d'affaires, valeur ajoutée et revenu brut dans le secteur non structuré et le secteur moderne des branches Bois, Cuir et Mécanique en 1977 (en 1 000 D, aux prix courants 1977)

	Chiffre d'affaires	Valeur ajoutée		Revenu ou Excédent brut
		Totale	Par tête	
<u>Bois-Ameublement</u>				
- Secteur non structuré	24 921	13 366	1,012	10 005
- Secteur moderne	19 205	6 881	1,215	1 634
- Ensemble	44 126	20 247	1,073	11 639
<u>Cuir-Chaussures</u>				
- Secteur non structuré	15 018	5 513	1,662	4 457
- Secteur moderne	21 590	7 124	1,911	1 728
- Ensemble	36 608	12 637	1,794	6 185
<u>Réparation mécanique</u>				
- Secteur non structuré	27 073	10 023	1,023	7 829
- Secteur moderne	5 749	(2)	(2)	(2)
- Ensemble	32 822	(2)	(2)	(2)

(1) En 1977, le secteur non structuré non localisé n'a pas été pris en compte. Mais, pour les trois branches considérées, cette composante du secteur non structuré est peu importante.

(2) On a déjà dit que la comptabilité nationale traitait jusqu'à maintenant le secteur des services de façon globale et indifférenciée. Il n'est donc pas possible de connaître la valeur ajoutée pour la branche réparation mécanique.

Il ressort de ce tableau que la valeur ajoutée des branches "Bois-Ameublement" et "Cuir-Chaussures" était sous-estimée respectivement des 2/3 et des 3/7. C'est dire l'importance des révisions auxquelles devra être conduit le planificateur.

On remarquera que, dans leurs premiers travaux, les comptables nationaux de l'INS ont opté pour l'établissement de comptes de branches distinguant secteur non structuré et secteur moderne. Cependant cette distinction n'a pas été maintenue dans l'établissement du Tableau Entrées - Sorties, car l'enquête n'a pas relevé l'origine des consommations intermédiaires, ni la destination des produits. Il faut dire que ces relevés auraient considérablement alourdi la collecte, à moins de se contenter de réponses globales approximatives.

D'autre part, la distinction entre secteur non structuré/secteur moderne ne recouvre pas exactement la dichotomie entrepreneurs individuels/sociétés et quasi-sociétés. Bien que de nombreux indices aient montré que le critère de la taille constituait une bonne approximation, il est néanmoins certain que la solution adoptée par l'Enquête Nationale en 1982 apportera une amélioration en privilégiant le critère de la comptabilité avec bilan, seules quelques sociétés de fait pouvant faire exception et ne pas disposer de comptabilité. Il n'est pas exclu également que quelques entrepreneurs individuels tiennent une comptabilité conforme au Plan Comptable, mais leur taille les range de fait dans les quasi-sociétés. En tout état de cause, la connaissance du statut juridique des entreprises qui pourraient faire exception devrait permettre d'homogénéiser la population des deux secteurs et de régler les litiges éventuels.

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Quelles que soient les améliorations que l'on peut apporter au système d'intégration du secteur non structuré dans les comptes nationaux tunisiens, il est clair que la prise en compte de ce secteur rapprochera le planificateur des réalités d'une économie dont la partie immergée est suffisamment importante pour rendre caduques certaines mesures de politique économique, ou du moins écousser ou détourner leurs effets attendus.

Si en effet, sans attendre les résultats de l'Enquête Nationale sur les activités Economiques en cours, on émet quelques hypothèses sur le niveau de la valeur ajoutée par tête des autres branches du secteur non structuré, on peut estimer que la valeur ajoutée des branches manufacturières était sous-estimée en 1977, de près de 46 %. C'est dire qu'après prise en compte du secteur non structuré du Bâtiment, des services et du commerce, la réévaluation serait d'au-moins 10 % de la PIB.

Par là, il ne s'agit pas de trouver une méthode permettant de gonfler l'évaluation des PIB dont les taux d'accroissement en valeur réelle ont fâcheusement tendance à diminuer, mais bien de prendre conscience que la richesse se crée (ou que le développement s'opère) en des lieux et par des moyens que l'imagination des planificateurs n'a pas toujours pu prévoir ou prendre en compte, réduite qu'elle était par l'insuffisance des données statistiques disponibles.

# AN APPROACH TO ESTIMATING TRADITIONAL SECTOR AGRICULTURAL OUTPUT FOR NATIONAL ACCOUNTS IN MALAWI, 1973-1978

by S.W.K. MKANDAWIRE

The lack of comprehensive data on a wide range of economic activities in the traditional sector poses serious problems in national accounting for a majority of African countries. Household Surveys that would collect data on production, capital formation, incomes etc..., of rural households are usually non-existent or run on ad hoc basis in many of these countries ; while price information for a variety of commodities often lacks. This has frequently lead national accounts statisticians to base their estimates on a set of weak and/or fragmentary information. The national accounts statistician in Africa is yet faced with another problem of trying to decide which activities should or should not be included in the accounts. This confusion arises out of the fact that there is yet no general agreement amongst many economists on what constitutes the production boundary for the traditional sector.

This paper describes how estimates of crop production for the traditional sector for the 1973-1978 national accounts for Malaŵi were derived and, the organization and management of the data collection machinery responsible for these estimates. The agricultural sector has been singled out since it forms the largest single sector in the accounts. Also, problems relating to the traditional sector in the accounts are varied and extensive precluding a fuller treatment in a paper of this nature.

## I - THE ECONOMY

### 1.1. General :

Malaŵi is a landlocked country South of the Equator lying between latitudes 9°45's and 17°16's and between longitudes 33°E and 36°E. It is 901 kilometres long and its width ranges between 80 and 161 kilometres. It shares common borders with Zambia to the West, Mozambique to the East, South and South West, and Tanzania to the North and North East. It covers an area of 118,484 square kilometres of which 24,208 square kilometres is water largely taken up by lake Malaŵi to the east of the

country. The 1977(1) census gave a de facto population figures of 5.5 million people of which 92 % was rural.

Due to lack of valuable mineral resources the economy is basically dependent on agriculture (40 % of GDP in 1978 of which 7% was from estate agriculture)(2) . Manufacturing, distribution and the government sectors each made up 11 %, 14 % and 9 % of GDP respectively. Both manufacturing and distribution sectors are substantially agro-based centering their activities in the processing and distribution of export crops such as tea, sugar tobacco and the manufacture and distribution of agricultural inputs and machinery.

Of the 2.3 million economically active people aged 10 years and above reported in the 1977 census 1.7 million (74 %) were Alimi(3) mainly growing food crops (maize, cassava, ground-nuts, rice beans, etc.). However some growers tend to strike a balance between food and cash crops such as cotton and oriental tobacco. Thus smallholder agriculture remains the single largest sector in the economy responsible for a third of its gross domestic product.

#### 1.2. Agricultural Statistics : Smallholder

Estate crops are largely grown on commercial basis and require registration. Such administrative requirements make it possible to include these establishments among the several postal surveys conducted by the National Statistical Office (NSO) requesting details on a wide range of economic issues. In the case of the traditional sector where crops are grown on customary land and are mainly for own consumption rather than commercial motivations, record keeping of details of their incomes, expenditures, assets etc., is virtually non existent. Also, the absence of registration of land and/or economic activities coupled with illiteracy problems precludes the inclusion of these activities amongst postal surveys conducted by NSO. Direct enumeration becomes the only choice of method through which information on their economic activities can be collected.

Since the establishment of the National Statistical Office during the second half of 1964 two National Sample Surveys of Agriculture (NSSA), one in the growing season of 1968/69 and the other in 1980/81, have been conducted with the purpose of collecting a wide range of socio-economic information on rural smallscale farmers. The information collected ranged from yields, production data, agricultural inputs, incomes and expenditures, energy requirements to nutrition patterns etc. While the 1968/69 data has been available for use for some years now it will be quite a while before the 1980/81 NSSA is analysed and published. Besides the National Statistical Office, the Agro-Economic

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(1) Malawi Government : Malawi Population Census, 1977  
National Statistical Office, 1980.

(2) Malawi Government : National Accounts Report, 1973-1978  
National Statistical Office (unpublished)

Survey (AES)<sup>1</sup> has also been engaged during the past decade in the collection and analysis of almost similar information in areas earmarked for agricultural development projects.

## II - ESTIMATES OF SMALLHOLDER AGRICULTURAL OUTPUT

### 2.1. Introduction

Since 1978 work has been underway at National Statistical Office to construct a set of national accounts for the country for the period starting 1973 to date. In this exercise emphasis was initially placed on the compilation of national income and product accounts for the period 1973-1978. The estimation of smallholder production, capital formation and consumption levels proved to be the most difficult. The 1968/69 NSSA and AES Reports which should have provided baseline data were found to be inadequate and weak for several reasons. Yield data were only available for two smallholder crops, maize and groundnuts. There was desperate need that estimates of other smallholder crops be constructed from firm survey based data rather than from a set of assumptions on consumption patterns and/or requirements of the population. Further than this it was the view of the National Statistical Office that the total area under cultivation, cropping patterns and yields per unit area could have changed substantially since the 1968/69 NSSA bearing in mind that the survey was carried out during the first four years of independence ; a period thought not to be characteristic of the impact of agricultural inputs in form of extension, infrastructure (roads, health, hospitals, clinics etc) and credit to the traditional sector as a result of increasing emphasis by the government to invest considerable public funds in this sector with the view of increasing smallholder agricultural productivity.

The inadequacy of the AES data lies in its not being comprehensive. In any one year the sample has been restricted to areas proposed for development projects and information is collected for only one growing season (in exceptional cases two growing seasons may be covered). The objective of the survey being to provide baseline information for monitoring and evaluation of the project once it is off the ground. In this aspect the survey lacks continuity.

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(1) A statistical unit within the Ministry of Agriculture charged with the responsibility for collecting and analysing farm and rural socio-economic data to provide baseline information for agricultural project planning and evaluation.



## 2.2. Methodology

In order to estimate total smallholder production of each crop, it was first necessary to estimate the total area cultivated for all crops. From farm surveys<sup>1</sup> was derived the mean cultivated holding size per farm household and the average farm household for each administrative district. The country has twenty four districts to date.

From the 1966 and 1977 population census results, a trend in population growth per annum was derived for each district enabling to estimate the population for each district in each year. These figures were sufficient to give total crop areas under smallholder cultivation. For example if the mean cultivated holding size was one hectare and there were on average five persons per household and fifty thousand people in the district in a given year, this would give a cultivated area of ten thousand hectares.

Farm surveys also collect information on the proportion of holdings devoted to each crop by farm households. All figures were rounded to the nearest thousand hectare for major crops and one hundred for minor ones.

Finally, data on yields from the various farm surveys was used to derive total production for each crop i.e. product of number of farm households, holding size proportion devoted to each crop and yield per hectare. The derived estimates were checked against seasonal indicators and assessments by agricultural field staff. A production estimate for each crop, in each year and by district was thus made up and rounded to the nearest one thousand metric tonnes. The year-by-year fluctuations were then checked against ADMARC<sup>2</sup> purchases for consistency.

## 2.3. Appraisal of methods

The method of estimating smallholder agricultural production outlined in 2.2. is itself not immune from weaknesses but was thought to be more objective and constituted a sound basis open for several improvements. The methodology can be evaluated in the light of past procedures used in constructing smallholder crop production estimates for national accounts by National Statistical Office and, the organization and management of the data collection machinery responsible for the 1973 through 1978 series of smallholder crop production estimates.

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(1) Agro-Economic Unit, and Evaluation Unit Surveys.

(2) Agricultural Development and Marketing Corporation (ADMARC) - A public corporation whose major responsibility is in the marketing of smallholder crops.

2.4. Estimates of smallholder crop production in old  
series of national accounts, 1964-1971.

Except for 1969, and only for two crops, maize and groundnuts whose production estimates were based on the yield estimates from the 1968/69 NSSA, estimates of smallholder crop production embodied substantial subjective views of national accounts statisticians leading to considerable margins of error. Due to lack of reliable and comprehensive data around which estimates of smallholder crop production could have been constructed a number of crop production estimates were based on a feel of consumption requirements by the population of crops grown by smallholders (1). In case of cash crops such as tobacco and cotton purchases by ADMARC and local market sales would be regarded as a proxy to production figures. Blades (2) also confirms this view that national accountants tried to quantify the written descriptions of crop conditions in the annual reports of the Ministry of Agriculture where "poor millet crop" could be interpreted as meaning five percent below normal.

III - THE ORGANISATION AND MANAGEMENT OF THE DATA COLLECTION  
MACHINERY RESPONSIBLE FOR THE 1973 THROUGH 1979 ESTIMATES

The statistical basis on which the 1973-1978 crop production estimates were based is itself a product of continued efforts mainly by the Ministry of Agriculture to improve and extend the reporting, monitoring and evaluation system for the agricultural sector within the National Rural Development Programme (NRDP) in Malaŵi. The improvement of living standards of the rural population through :

- a) the increase in the general level of smallholder crop production with emphasis on cash crops for export and for feeding the growing urban population,
- b) the provision of a varied range of inputs and services necessary to enable smallholder crop production increases with emphasis on productivity per unit area, and
- c) the preservation of natural resources by encouraging high standards of crop husbandry form the main objectives of the NRDP<sup>3</sup>.

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(1) National Accounts Report, 1964-1971, NSO, March, 1974, p.33.

(2) D.W. Blades, Non-Monetary (Subsistence) Activities in the National Accounts of Developing countries, Development Centre of the Organization for Economic Co-operation and Development, Paris 1975, p.21.

(3) Malaŵi Government : NRDP, Policies, Strategies and General features, september, 1978.

Of interest to this paper is the planning and organization of NRDP implementation with emphasis on the evaluation units set up under the Agricultural Development Divisions.

### 3.1. Planning and organization of NRDP implementation

The implementation of NRDP is the responsibility of eight management units - Agricultural Development Division (ADD's) covering a population of approximately (1,118,490) farm families in 1981. ADD's are further subdivided into Rural Development Projects (RDPs) Areas which have Extension Planning Areas (EPA's) as their smallest units.

In 1978 the country had 180 EPA's (based on ecologically uniform areas with identifiable topographical boundaries) each comprising of 5,000 farm families (24,000 people) on average. An EPA is required not to exceed 750 square miles and/or 10,000 farm families. Between 4 and 5 EPA's make up an RDP and also 4 or 5 RDP's usually make up an ADD.

The need for monitoring and evaluation of the NRDP arises from the commitment by government to invest considerable sums of public funds, manpower and other resources as a prerequisite to raising productivity in smallholder farms and real incomes of the rural population. Thus "... the government considers agricultural statistics to be of the utmost importance for NRDP. To plan efficiently comprehensive knowledge is needed on the various factors associated with the agricultural sector and their distribution within the various segments of the country(1)".

### 3.2. The Evaluation Unit

To facilitate monitoring and evaluation of NRDP's objectives there is established under each ADD an evaluation unit whose main purpose is the collection and analysis of data for the monitoring and evaluation of the ADD's objectives during and after the project's life. Information collected ranges from data on acreage, production, land use and tenure, size of holdings, tools and implements used to farm incomes and expenditures, yield designs for the field surveys are unusually two stage stratified random samples covering between 0.5 % and 1 % of the rural population in each area.

The staffing of the evaluation unit comprised of about eighteen enumerators each assigned to an EPA(2)

(1) MALAWI Government : NRDP, Policies, Strategies and general features, september 1978, pp. 3026

(2) J. Doughty : The reporting Monitoring and Evaluation System for the National Rural Development Programme in Malawi. A paper written for the Regional Workshop on Monitoring and Evaluation of Rural Development Projects in Eastern Africa, Nairobi, April, 1979.

cases where an enumerator covered two EPA's. Enumerators were under the supervision of three team leaders who were themselves directly responsible to a field officer (diploma/certificate level) and an evaluation officer (graduate level).

#### IV - APPRAISAL OF THE SYSTEM

The system outlined in sections 3 and 4 reflects a systematic approach and significant improvements in the treatment of the traditional sector in national accounts if compared to previous practices (see 2.4.). Without independent estimates from the 1980/81 national sample survey of agriculture it will be sometime before the reliability of these estimates is firmly established and a full appraisal of the methodology rendered possible. However, one or two things could be worth pointing out here.

Firstly, the evaluation units laid much emphasis on the collection of comprehensive details for a selected number of crops grown by smallholders. These ranged from main food crops (maize, groundnuts, rice and millet) to cash crops i.e. tobacco and cotton. A variety of other important cash crops and fruits were not under the coverage of the evaluation unit surveys. These include sugarcane, fruits and vegetables (bananas, mangoes, oranges, pawpaws, pineapples, peas, cabbages, tomatoes etc.) most of which may be responsible for a considerable proportion of cash incomes of the rural farm households. Though, in the accounts, allowance was made for these crops their production estimates are bound to be weak since they were largely based on a set of assumptions. There is therefore need for the evaluation unit to extend the coverage of their surveys to include a wider range of crops grown by smallholder farmers.

The NRDP document gives the feeling that the enumerator assigned to an EPA was required to do a host of other responsibilities such as extension work besides collecting statistical information. In this case there is need that EPA's be subdivided so that each individual has a manageable number of farm households under him. This would tend to apply to the entire evaluation unit structure.

In 1978 there were still areas of the country not yet covered by the ADD's. It was then logical in the estimation of crop production for these areas to assume that their features, cropping patterns and yields corresponded to some already covered by ADD's.

V - CONCLUSION

The paper has discussed the organization and function of the evaluation unit as a statistical unit within the Agricultural Development Divisions initially set up to collect and analyse socio-economic data of rural farm families with a view to providing necessary information for monitoring and evaluation of agricultural projects. In recent years such information has not only proved useful to the Ministry of Agriculture but has also found its use and place in national accounts where economic data on the traditional sector was previously lacking. For the period prior to 1980 the evaluation unit data could be deemed as providing independent information along side that of the 1968/69 National Sample Survey of Agriculture.

However, since 1980 the organization and management of statistical units collecting and processing agricultural data has gone through some considerable change. The Ministry of Agriculture in conjunction with the National Statistical Office are jointly coordinating their efforts and resources through the Annual Survey of Agriculture (ASA) in the collection and processing of agricultural data. The Ministry through the evaluation units cover ADD's while NSO has deployed its personnel in the non project areas. Under this arrangement all processing of data from core surveys is the responsibility of NSO. For consistency the sampling unit presently adhered to is the enumeration area (and not EPA) as defined in the 1977 population census. One enumerator is assigned to an enumeration area (EA). Though the coverage of crops could still be deficient the system does constitute a major break through in the data collection process for the traditional agricultural sector.

AGRICULTURAL STATISTICS IN THE CONTEXT  
OF THE NATIONAL ACCOUNTS FOR BOTSWANA

by Gilbert L. MOTSEMME

Gathering agricultural statistics in Botswana is the responsibility of several agencies, both within and outside the Government of Botswana (GoB). This paper outlines the existing agricultural data situation in the country. The coverage places particular emphasis on the traditional sub-sector and assesses the adequacy of these data in constructing production accounts for agriculture.

Data sources used to estimate the national accounts concerned with the agricultural sector are also reviewed. Limitations of these data sources are discussed, and data shortfalls and weaknesses, from the point-of-view of meeting the GoB's demands, are evaluated.

The views expressed here are those of a survey statistician rather than a national accounts specialist.

I - COMPONENTS OF THE AGRICULTURAL SECTOR NATIONAL ACCOUNTS

In 1979/80 the latest year for which complete statistics are available (See Table 1), the Agricultural Sector contributed about 11,0 percent of Botswana's Domestic Product. The Traditionnal (100) and Freehold Farming (101) Agricultural sub-sectors accounted for approximately 70,0 and 10,0 percent of agriculture's contribution, respectively. The sub-sectors of Forestry (102), Fishing (103) and Hunting (104) accounted for the remaining percent.

Table 1 Relative Contribution  
to the Agricultural Sector

	Pula (million)	Percent
Traditional Agriculture (100)	53,9	71,6
Freehold Farming (101)	7,0	9,3
Forestry (102) Fishing (103)		
Hunting (104)	14,4	19,1
	<hr/>	<hr/>
Agriculture	75,3	100,0
	<hr/>	<hr/>

Source : Botswana National Accounts 1979/80

In the future, it is expected that the relative contribution of agriculture to the national economy will fall as a result of increased contributions of the modern sectors. However, agriculture still remains the largest single sector of the nation's economy from the perspective of population support. Better than 85 percent of Botswana's population lives in rural areas and is largely dependent on traditional agriculture. According to 1981 Crop and Livestock Survey estimates, there were 84 200 traditional farmers engaged directly in agriculture. Eighty percent of these farmers were cattle holders and/or were involved in crop production.

## II - EXISTING STATISTICAL POSITION IN RELATION TO THE AGRICULTURAL SECTOR OF THE ACCOUNTS

Data used to estimate production levels for the various sub-sectors of agriculture are obtained from a variety of sources. Non-formal traditional agricultural activity estimates, such as fishing, wild food gathering and subsistence hunting, are based on the Rural Income and Distribution Survey : 1974/75 (RIDS). Crop and livestock production data, off-take rates, etc, are provided by the Ministry of Agriculture's Botswana Agricultural Statistics, which is published annually.

In the past, cattle prices estimates have been based on data provided by the Botswana Meat Commission (BMC), a parastatal body with an export monopoly on meat and meat products. This organization, which normally purchases 80 percent of the cattle sold in Botswana annually, maintains a comprehensive data system on number of cattle slaughtered and price received by farmers.

These BMC price data are used to derive the total value for commercially marketed cattle as well as for cattle within traditional sector. In this latter case, the value of subsistence sales is calculated as a residual of traditional total sales less purchases by the BMC from the traditional sub-sector.

On the crop side, the gross value of production is estimated using Botswana Agricultural Marketing Board (BAMB) price data. BAMB, another parastatal agency, is charged with providing a guaranteed market for food grains and cash crops at annually guaranteed prices. For some agricultural products, such as home produced maize meal, producer values are based on known retail prices.

Finally, beginning with the 1981/82 Agricultural Census, the Ministry of Agriculture has begun obtaining data received at the producer level for certain agricultural products. Price data are presently being obtained on cattle, sheep and goats, and food and cash crops sold by traditional farmers. In the future it is planned to expand this latest Ministry of Agriculture data gathering efforts. Eventually, it is hoped to obtain a complete data bank on "at-the-farm" agricultural product value. In the interim, other measures have been taken to augment existing data. These measures include the conduct of the Census of Production and Distribution (CPD) which is currently the most important source of data for most aspects of the National Accounts Statistics. The CPD was first launched in 1973/74, and, as the result of many refinements introduced in more recent years, it has successfully bridged many of the statistical gaps which previously characterized the accounts. Within the agricultural statistics sector, the CPD provides much of the data used to estimate the Freehold Farming subsector accounts (101).

### III - ASSESSMENT OF THE EXISTING SITUATION WITH RESPECT TO STATISTICS OF THE TRADITIONAL AGRICULTURAL SUB-SECTOR

In Botswana, seasonal migration patterns are often used by farmers engaged in traditional agricultural production. During different periods of the production year, traditional farmers may reside in one of three locations - - villages, lands areas and cattle post areas. Crop production activities are normally conducted at the lands areas while most livestock raising activities occur at the cattlepost areas. These three locations may be dispersed over a wide geographic areas. As a result, when selecting sample farmers for Agricultural Survey, it is important to attach them to specific localities. Only in this way can duplications and/or omissions be corrected for in the sampling frame.

Only since 1974 has this peculiar structure of the Botswana agricultural sector been recognized when selecting the Agricultural Survey sample. As a result, there was some



reluctance on the part of the National Accounts Unit to use the Survey data without adjustments. However, since the sampling adjustments were made, the Unit has placed much more reliance on the Survey.

Another complaint of the National Accounts Unit in earlier years was that results of the survey were not specified with sufficient accuracy (as measured by the coefficient of variation). To offset this complaint, the size of the Survey has expanded considerably in recent years. For example, in 1978/79 approximately 500 traditional agricultural holders were interviewed under the survey. By 1980/81 this number was expanded to better than 2,000. As a result, Survey results have been "tightened" considerably (see Table 2). In 1981, coefficient of variations for estimates of livestock numbers in Botswana ranged from a low of 5.7 percent for goats to a high of 12 percent for horses. Cattle numbers, representing the most important subsector of agriculture, were estimated with a 6.7 percent C.V. during this same year.

Table 2 Livestock Estimates, 1981

<u>Livestock</u>	<u>Traditional</u>	<u>Commercial</u>	<u>Total</u>	<u>Coefficient of variation</u>
	(----- number -----)			(percent)
Cattle	2 495 000	472 000	2 967 000	6,7
Sheep	121 000	18 700	139 700	11,9
Goats	603 000	18 200	621 200	5,7
Mules/donkeys	124 400	2 400	126 800	7,3
Horses	19 900	3 700	23 600	12,0
Chickens	938,000	108,000	1 046 000	8,4

Source : 1981 Botswana Agricultural Statistics.

An examination of Table 3, which shows the coefficient of variations for livestock estimates in 1979, 1980 and 1981, illustrates the results of this "tightening" effort. In nearly every instance, C.V.'s of the estimates have been reduced substantially over the period shown.

Table 3 Measures of Precision for Livestock Estimates

<u>Livestock</u>	Coefficient of Variation		
	<u>1979</u> <sup>1/</sup>	<u>1980</u> <sup>2/</sup>	<u>1981</u> <sup>3/</sup>
	( - - - - - percent - - - - - )		
Cattle	8,5	8,2	6,7
Sheep	14,3	17,1	11,9
Goats	9,8	7,2	5,7
Mules/donkeys	12,9	7,9	7,3
Horses	20,3	18,0	12,0
Chickens	17,4	5,2	8,4

Sources : 1/ 1979 Livestock and Crop Survey.

2/ 1980 Botswana Agricultural Statistics.

3/ 1981 Botswana Agricultural Statistics.

However, the Agricultural Statistics Unit is not "resting on its laurels". Continuing efforts are being made to provide an even more comprehensive and accurate set of agricultural data. New data gathering and analytical techniques are being tested for this purpose. The questionnaires used are constantly being reviewed and revised. Enumerator training is being adjusted and improved to reduce non-sampling errors.

#### Appraisal of Sources for other Agricultural Sub-sectors

The Survey just described is only one of the sources used to provide data on Botswana agriculture. Its target group is farms in the traditional subsector. Other sources are also used to complete the overall agricultural picture. One of these is the CPD, a mail survey administered by the Central Statistics Office which canvasses a sample of commercial farms. The CPD provides data on the Freehold Farming subsector of the country. It is regarded as one of (if not the) most reliable data sources for the agricultural sector and has a response rate of up to 75 percent.

Data on the subsectors of Forestry (102), Fishing (103) and Hunting (104) are based on extrapolations from the Rural Incomes Distribution Survey (RIDS), which was conducted in 1974/75. RIDS results have provided benchmark inputs for these subsectors. However, because of the rapid expansion in the economy of Botswana, it is questionable how accurate seven to eight years old data are in explaining present subsector conditions. In addition, many of the definitions used in the RIDS survey are

no longer considered appropriate for the present situation. For example, the concept of a "holding" under RIDS and the present crop and livestock production surveys differ considerably.

According to RIDS report, "No other definition in the survey caused ... as much difficulty as the definition of a household". The absence of clearly prescribed rules for establishing meaningful and easily applicable concepts of holding and holder may have contributed to the difficulties encountered during the course of the survey. These factors may also have biased the results.

The Agricultural Survey, on the other hand, considers a holding as an aggregate of all land, livestock and poultry operated as a single technical unit under a single line of management. The person vested with such managerial functions is regarded as the holder.

Administrative records from at least some non-government agencies are also used as inputs for some subsectors of agriculture. However, there are often conceptual problems when data are used for purposes for which they were not designed. For example, the adequacy of price data obtained from the BMC and the BAMB for use in estimating the value of agricultural sales must be examined. The accuracy of these price data should also be examined, especially in terms of the administrative machinery producing them.

Despite all of these data limitations (or perhaps because of them), the National Accounts Unit of the Central Statistics Office continues to issue National Accounts reports which show graded improvements with respect to the agricultural sector. Their latest publication the eleventh in the series, was released in early 1982 and refers to the year 1979/80.

#### IV - SCOPE FOR IMPROVING AGRICULTURAL STATISTICS FOR THE NATIONAL ACCOUNTS

The agricultural statistics program in Botswana is now at a critical stage. The data collected must satisfy the demands of a diversity of interest groups. On the one hand, there is an increasing demand for data to assist management decisions, policy making, and development planning in agriculture. On the other hand, many individuals and private institutions require data to evaluate different programs and projects.

The Agricultural Statistics Unit must answer the question : who should receive preference in the provision of Data ? At present, the Agricultural Statistics Unit is attempting to provide a balanced and continuously up-dated reference for policy implementation and management decisions in the agricultural sector. However, wider coverage and more in depth data gathering efforts are needed before the construction of the production accounts in the agricultural sector can depend entirely on these data.

Despite the limitations and deficiencies still existing in the agricultural statistics program, the preparation of the economic accounts for agriculture are still heavily dependent on them. Almost all statistics presently collected relate to agricultural statistics presently collected relate to agricultural holdings. The data on agricultural production as an economic function of agriculture are aggregated on the basis of agricultural holdings. "Holdings", as a statistical unit, are amenable to classification according to the established international standards.

The holding approach relates to data collected on the basis of :

- (i) decennial censuses of agriculture ;
- (ii) annual integrated program of sample survey of :
  - a. areas and yields of principal crops,
  - b. livestock and poultry numbers,
  - c. labor usage in raising farm products,
  - d. farm requisites used by holders
  - e. production, utilization, marketing and producers price information ; and
- (iii) Ad hoc surveys on factors relevant to agricultural production.

## V - GENERAL OBSERVATION, CONCLUSIONS AND RECOMMENDATIONS

This paper has reviewed the status of the program of agricultural statistics in Botswana in the context of the agricultural sector of the national accounts. Several deficiencies in the program have been identified and their impact on the agricultural production accounts have been recognized. The major limitations in the program of agricultural statistics are noted to be aggravated by the complex nature of the organization of agricultural production in the country. This problem is further compounded by the myriad of production activities within the non-formal sub-sector of traditional agriculture. Together with the non-characteristic products of agricultural holdings, these factors contribute to conceptual, procedural, and methodological problems in the compilation of the economic accounts for agriculture. It is against this background that the reliability of the Botswana National Accounts estimates must be evaluated.

On the other hand, the country's program of agricultural statistics has improved tremendously. However, it still does not completely satisfy the requirements of the national accounts' agricultural sector. Many other sources will continue to be required, and ad hoc type of surveys will need to be

conducted to supplement the existing agricultural statistics collection arrangements. This situation may prevail for a very long time because of the diversity of interest groups whose data requirements are to be met. Considering the constraints imposed on the agricultural data collecting agency by budget limitations, an optimum balance must be reached between the quality and quantity of data collected, on the one hand, and the amount of resources utilized for that purpose, on the other.

It is hoped that, in the long-term, the program of agricultural statistics will be basically oriented toward, among other things, fulfilling the data requirements of the National Accounts. This objective will, however, require much preparatory work in mobilizing the necessary organization and resources. Both the numerical and qualitative improvement through training of personnel in all areas of agricultural statistics constitute the most important aspects of the organizational problems that need to be resolved. Efforts in this direction are already underway.

### ACKNOWLEDGEMENTS

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## THE SUBSISTENCE SECTOR IN TANZANIA

by John M. KOMBA

1.1. The United National Economic Commission for Africa defines subsistence production activities as "the production of goods and services which are subsequently found to have been directly used by producers and not exchanged for money". In several countries, particularly in the Less Developed Countries (LDCs) all goods and services are not transacted through the market. In the LDCs for example a significant part of the agricultural output is likely to be consumed by the producers' own household. A part of the production may be bartered between producers and consumers or may be exchanged between producers and consumers for work done. The flow of housing services to owner occupiers of dwellings is another example of production not recorded in the market. In some cases, wages and salaries paid to employees may be partly in kind out of the own products of the employer. There are instances such as own account fixed asset formation by producers which are not recorded in the market.

1.2. This problem is perhaps more pronounced in Tanzania than the other LDCs, because in Tanzania more than fifty percent of the value added is accounted for by agriculture alone and about 86.9 percent of the population lives in the rural areas. It is in the rural areas where most goods and services are not transacted through the market. Agricultural goods and services not transacted through the market accounted for 32 percent of the Gross Domestic Product (GDP) at factor cost in 1978. Whereas the total subsistence production (i.e. value added) was 38 percent of the total GDP in the same year. Of late, the government emphasis has been on increased production of cash crops by encouraging farmers to shift from subsistence production to commercial production so that a higher rate of growth for the economy as a whole can be achieved.

1.3. In Tanzania, the subsistence sector comprises of crop husbandry, animal husbandry, forestry, hunting, fishing, own account construction of rural residential buildings and imputed rental value of owner occupied dwellings. The value added in respect of all these make the total value added in the subsistence sector. The following is an account of how the value added in the subsistence sector is estimated.

## CROP HUSBANDRY

2.1. Coffee : The total marketed production of coffee is obtained from the Tanzania Coffee Board, a board which is responsible for marketing of coffee. Estimates of subsistence production are not readily available. They are obtained on the basis of a report published by International Coffee Organisation in 1968 in which the estimate for subsistence production was put at 2950 tons. This estimate has been used with adjustment of the rural population growth rate for the subsequent years. The quantity of production has been valued at the prices paid to growers net of cess, levy and transport costs. The cost of production (fertilizer and insecticides) is deducted to obtain the value of subsistence production.

2.2. Sugarcane : The marketed sugarcane production is obtained on the basis of conversion factor calculated from the survey of Industrial production undertaken yearly by the Bureau of Statistics. Estimates of subsistence production are very rough. The ministry of agriculture estimates of sugarcane marketed for chewing purposes was put at 40,000 tons in 1968. This estimate has been used with adjustments of the rural production. Subsistence production has been considered as 50 percent of 40,000 tons and is valued at the average price of sugarcane paid to growers. The cost of production was estimated at shillings 4.10 per ton or 10 percent of the gross value.

2.3. Cashewnut : This is entirely a peasant crop and the marked cashewnut production is obtained from the Cashewnut Authority of Tanzania. Subsistence production was arbitrarily estimated as 4000 tons in 1967 and 4200 tons in 1968.

The value was estimated at the price paid to growers. The costs of production have been allowed for at 4 percent on the basis of data obtained from some farm studies. These estimates have been assumed to grow at the same rate as the rural population.

2.4. Tobacco is greatly consumed by the rural population as cigarettes or snuff. Owing to lack of data on the consumption of snuff and cigarettes by producers themselves no estimates of the subsistence production have been made separately. Although miscellaneous bye-products include all other agricultural products not covered elsewhere, snuff and cigarettes consumed by producers themselves should have been treated separately.

2.5. Nonexport Crops : Besides the above export crops, the ministry of agriculture through the District Agricultural Officers furnishes the Bureau of Statistics with figures of total production and marketed production of various agricultural commodities and the prices paid to growers. These prices paid to growers are used



to get both the values of total and marketed production. The value of subsistence production is obtained as the difference between the two. Some adjustments have been made in respect of maize, rice, sorghum, beans, cassava, sweet potatoes on the basis of the data obtained from the 1969 Household Budget Survey (HBS). In case of fruits and vegetables, the estimates of subsistence production thus built up from the HBS results have been assumed to grow at the rate of 2.7 percent (population growth) because the ministry's figures were very erratic and were rejected. The cost of production has been taken as 10 percent of the gross value for paddy, wheat and oil seeds and 4 percent for maize and all other non-export crops on the basis of information obtained from a large number of published and unpublished farm studies.

2.6. Miscellaneous bye-products : These comprise of cassava leaves, potato leaves, straws, grass etc. for which no production figures are available. Since these are utilised for human consumption or used as human food, fuel or for rural construction purposes then the value had to be estimated. Five percent of the total value of production of all non-export crops has been taken as the value of miscellaneous bye-products and included in the value of subsistence production.

Table I : Subsistence Production Crop husbandry Shillings million

	At Current prices		At Constant prices	
	1977	1978	1977	1978
<u>Export Crops</u>				
Coffee	103	103	17	17
Sugarcane	2	2	1	1
Cashewnuts	6	8	4	5
<b>Total</b>	<b>111</b>	<b>113</b>	<b>22</b>	<b>23</b>
Cost of production	1	3	1	1
<b>Value Added</b>	<b>110</b>	<b>110</b>	<b>21</b>	<b>22</b>
<u>Non-Export Crops</u>				
Rice	395	430	144	162
Wheat	35	28	16	13
Groundnuts	129	183	31	39
Sesame	20	11	7	4
Sunflower	48	49	12	12
All other crops*	5589	7800	1537	1628
<b>Total</b>	<b>6216</b>	<b>8501</b>	<b>1747</b>	<b>1858</b>
Cost of production				
(a) Rice-Sunflower (10p.c)	76	70	21	26
(b) Other crops (4 p.c)	218	288	61	71
<b>Total cost of production</b>	<b>294</b>	<b>358</b>	<b>82</b>	<b>97</b>
<b>Value Added</b>	<b>5922</b>	<b>8143</b>	<b>1665</b>	<b>1761</b>
<b>Value Added-Crop husbandry</b>	<b>6032</b>	<b>8253</b>	<b>1686</b>	<b>1873</b>

ANIMAL HUSBANDRY

3.1. Milk : From the 1964 Census of Commercial farming, the ministry of agriculture has established the proportion of cows in milk and the yield rates of milk. The milk rates used for national accounts puposes are 384 gallons per year per and 48 gallons per year per indigenous cow. The number of goats

\* Includes miscellaneous bye-products

in milk was also established and the yield rate of milk was taken at 24 gallons per year per goat. The ministry established that the total quantity of milk marketed was 20 percent and subsistence production at 80 percent of the total milk production. The average prices at which factories purchases milk in bulk was ascertained through the survey of Industrial production. The total number of cows in milk has been estimated to increase at the rate of 4.5 per cent yearly and the number of goats in milk has been estimated to increase at the rate of 2.7 percent per year.

3.2. Meat : The ministry of agriculture believes that about 95 percent of the hides of all animals slaughtered in the country do come into the export market. On this assumption the number of cattle, goats and sheep slaughtered in the country has been derived from the average number of such hides purchases for export purposes. The ministry's average quantity of meat per animal slaughtered has been taken at 250 lbs for cattle, 21.6 lbs for goat and 17.6 lbs per sheep. The quantity of subsistence production of meat has been taken as the difference between the total meat production and the total meat production at licenced slaughter houses. The subsistence production of meat has been assumed to increase at a rate of 5 percent the same rate as for the population and marketed production. The average price paid by The Tanganyika Packers Ltd per kg carcass has been utilised for evaluation.

3.3. Offals : The value at producers prices of kidneys, liver, heart, oxtail, tongue, lungs, spleen and head per animal has been taken at 20 shillings in case of cattle and 2 shillings for goat and sheep on the basis of information obtained from Tanganyika Packers Ltd. On the same assumption as for meat production, the subsistence production here is taken as the difference between the total production and the marketed production.

3.4. Eggs : The ministry of agriculture made available rough estimates of eggs produced and sold to non-producers as well as used for own consumption. The number of eggs produced for own consumption by producers in 1968 were 34.8 million. The average producer price was 2 shillings per dozen for both marketed and subsistence production. Subsistence production has been estimated to grow at 2.8 percent.

3.5. Chicken, pigs and ducks : On the basis of the data collected through the 1969 HBS, estimates of subsistence production have been built up. The total value at producers prices of chicken was estimated at 32.2 million shillings, of pig meat was 4.4 million shillings and of duck-meat was Subsistence production has been assumed to grow at 2.7 percent.

3.6. Increment in stock (Beef cattle) : Estimates of livestock population provided by the ministry of agriculture have been utilised to obtain the annual increment in stock. The average price at farm site has been used to evaluate the value of increment in stock. On the basis of the number of animals slaughtered in

the licenced slaughter houses etc, it has been considered reasonable to assume that about 20 percent of the value of increment in stock alone is perhaps in the monetary economy. Of the value of increment in stock 48 percent is taken as Dairy and Breeding cattle which forms part of the fixed capital formation and 52 percent is taken as beef cattle. Thus 80 percent of the value of increase in stocks of beef cattle has been taken as subsistence production.

3.7. Cost of production : very little data are available in regard to the production costs incurred by producers of livestock and livestock products. On the basis of some scattered data available in a few farm studies and also on the basis of discussions with some farmers an allowance of 15 percent has been considered realistic to count for miscellaneous production costs such as purchased feed, medicines, dipping charges, licence fees, marketing charges, maintenance of sheds or other equipments etc. This rate has been applied for both marketed production and subsistence production as the prices used for evaluation happen to be the same in either case.

Table 2 : Subsistence Production - livestock

	Shs.million			
	At Current prices		At Constant prices	
	1977	1978	1977	1978
Milk	643	670	226	234
Meat	408	420	252	263
Offal	35	35	21	21
Eggs	15	16	8	7
Chicken, ducks&pigs	77	89	42	47
Increment in Stock	46	48	42	43
<b>Total</b>	<b>1226</b>	<b>1278</b>	<b>591</b>	<b>615</b>
<b>Cost of production</b> <b>15 per cent</b>	<b>183</b>	<b>192</b>	<b>89</b>	<b>93</b>
<b>Total Value Added</b>	<b>1041</b>	<b>1086</b>	<b>502</b>	<b>522</b>

#### FORESTRY

4.1. Timber : The forestry division of the ministry of agriculture has reasonably reliable figures of recorded production of timber. On the basis of some report on timber production by FAO of 1967, the timber production amounted to 11.43 million cu.ft. of which recorded timber production was 4.71 million cu.ft. leaving 6.72 million cu.ft. as unrecorded timber production. The average producer price of shillings 2.8 per cu.ft. was used for evaluation. The growth of timber production has been taken at 2.7 percent the same as population.

4.2. Poles : As in the case of timber, the forestry division has made certain rough estimates of unrecorded production of poles in the country in 1967. These estimates have been used for the calculation of GDP. An average price of sh 1 per cu.ft. or sh. 0.50 per pole has been utilised for the purposes of evaluation. A growth rate of 2.8 percent has been used for estimation of poles production.

4.3. Fuelwood : On the basis of the 1969 HBS, the household consumption out of own production of firewood and charcoal was estimated to be about shillings 150.4 million and the sales about shillings 6.0 million. For the subsequent years, a growth rate of 2.5 percent the same as that of the rural population who primarily depend upon firewood has been assumed.

4.4. Honey : An estimate subsistence production of honey has been built up on the basis of the data collected from the 1969 HBS. The subsistence production has been assumed grow at the same rate as the rural population.

4.5. Cost of production : The available data on costs of production being very meagre, it has been possible to make only rough allowance for production costs. The pitsawyers do generally use hand tools, ropes etc. The transport to road head is generally provided by human labour only. Their expenses on ropes etc. may not amount to more than 15 percent per cu.ft. according to the forestry division. Fuelwood production is again mainly by labour only though there may be some expenses on transport and ropes or strings. Such expenses has been reckoned at 10 percent of the value of output.

Table 3 : Subsistence Production - Forestry

	shs.million			
	At current prices		At Constant prices	
	1977	1978	1977	1978
Timber	22	24	20	23
Poles	39	20	39	20
Fuelwood	213	219	203	207
Honey	11	11	11	11
<b>Total</b>	<b>285</b>	<b>274</b>	<b>273</b>	<b>261</b>
Cost of production 10 per cent	28	27	27	26
<b>Value Added</b>	<b>257</b>	<b>247</b>	<b>246</b>	<b>235</b>

## FISCHERY

5.1. The fisheries division of the ministry of agriculture compiles annual estimates of fish caught in the country. Lake fish accounts for about 83 percent of the estimated total fish production in the country. The fisheries division also provides the value of fish catch evaluated at producers price. These figures are adjusted to allow for the catch of fish for non-professionals and also for sea-weed, shells etc. collected. This adjustment is about 5-6 percent of the total value fish caught. The subsistence production of fish has been built up on the basis of the HBS data and is taken as 16 percent of the value added originating from fishing.

5.2. Cost of production : The number of boats with and without motor engines have been obtained from the fisheries division. The average fishing expenses per non-powered boat has been taken at shillings 90 per year on the basis of information from the fisheries division. The average life of a fish net is reported to be less than one year and therefore the value of nets imported (marked up by 30 percent to allow for distribution costs) less the value of fish nets exported has been deducted as inputs.

## HUNTING :

6.1. The data available on hunting activity relate to the number of licences issued, rates of licences fees payable, the total fees collected, the value of sales of trophies by government, expenses incurred by government on rewards in respect of ivory and trophies and exports of ivory and skins. The value of trophies collected by private hunters has been obtained as five times the value of game licences and fees collected by government. The estimate of the total value of game trophies, so obtained, appear consistent with the value of subsistence consumption of meat of wild animals as obtained through the 1969 HBS adjusted for exports and also for some utilisation of skins, bones etc for local craft industries. Thus the unrecorded hunting is taken as subsistence production and is 50 percent of the value added originating from hunting.

6.2. Cost of production : The government collection by way of game licences and fees has been treated as production costs in the hunting industry. Similarly the expenses for government on rewards in respect of ivory and trophies and expenditure on repairs of arms and ammunitions have been treated as production costs. Miscellaneous costs of private hunters other than on licences and fees have been taken as 5 percent of their estimated output.

## CONSTRUCTION

7. Estimates of own account construction of rural residential buildings have been obtained through the survey of rural construction and rental value conducted by the Bureau of Statistics for national accounts purposes and on the assumption that such residential construction (after allowing for replacement) keeps pace with the population growth. The own account construction of rural residential buildings is taken as subsistence production, it is 42.9 percent of the value added of construction.

OWNER OCCUPIED DWELLINGS

8.1. The 1969 HBS indicates that in the rural areas about 96 percent of the households live in their own houses. The average annual rental value per household in rural houses was obtained from the HBS as well. Thus, of the total annual rental value of rural houses obtained as a product of the total number of rural households and the average annual rental value per household, 4 percent has been taken as the rental value of rented dwellings and 96 percent as the imputed rental value of owner-occupied rural dwellings. In the urban areas, the proportion of households living in rented houses have been ascertained by the HBS at 65 percent and 35 percent live in their own house. Using these data, the total rental value of the urban owner occupied dwellings has been obtained. The number of urban household has been estimated to grow at an annual rate of 7 percent and rural household at a rate of 2.5 percent based on the data on estimates of fertility, mortality and population growth.

8.2. The imputed rental value of owner occupied dwellings in rural and urban area is taken as the subsistence production. However, in both cases the average annual rental value is adjusted from one year to the other on the basis of Dar es Salaam wage earners cost of living Index. The annual maintenance cost has been taken as 12.5 percent of the total subsistence production in rural and 6.0 percent in urban areas and this cost has been deducted from the total production.

Table 4 : Subsistence Production

	Shs million			
	At current prices		At constant prices	
	1977	1978	1977	1978
<u>Agriculture :</u>				
crop husbandry	6032	8253	1686	1873
Animal husbandry	1041	1086	502	522
Forestry	257	247	246	235
Fishery	116	149	45	50
Hunting	8	9	8	9
<u>Construction</u>	135	156	68	70
<u>Owner-occupied dwellings</u>	1236	1566	618	638
<u>Total subsistence Production</u>	8825	11466	3173	3397
<u>Total GDP at f.c.</u>				
Monetary and Non-Monetary	26123	29993	10832	11455

### ESTIMATION AT CONSTANT PRICES

9.1. In deriving the constant price estimates of GDP, the current year quantities of production of individual commodities have been evaluated at the base year prices (1966). Thus the quantities of production of all agricultural commodities such as maize, millets, meat, milk, timber, fish etc in the years 1977 and 1978 have all been evaluated at the 1966 prices. Costs of production have been allowed for at the same rate as in the base year. The value of fertilizers and insecticides used has also been obtained as the product of the current year quantities and the base year prices.

9.2. The value of own account construction is estimated by multiplying the number of houses in the current year by the cost of construction at 1966 prices and then 42.9 percent of the product is taken as the value added from own account construction.

9.3. As for the owner occupied dwellings the number of houses in the rural and urban areas in the current year has been multiplied by the average annual rental value of 1966 and of the total rental value thus obtained, 96 percent has been taken as the imputed rental value at constant prices.

### PROBLEMS IN THE ESTIMATION

10.1. As regards the estimates of crop husbandry, the estimates of total production and marketed production are made by the district agricultural officers. The estimates of total production are based on eye observation and are thus subject to a large margin of error. The estimates are not based on any crop cutting survey. The marketed production estimates are built up from the crop Authorities' purchases from producers and thus these estimates do not include crop sales between producers and consumers. Therefore, the estimates of non-monetized production which are taken as the difference between total production and marketed production are inflated by the inclusion of such monetary transactions.

10.2. Most of the estimates of the subsistence production and GDP in general have been built up on the basis of rates built up from a limited number of surveys and studies of the midnineteen sixties. The situation now is quite different thus warranting a revision in the rates used.

10.3. But the major drawback in these estimates is the complete lack of reliable data on poultry, non-professional hunting and fishing, private rural and urban residential dwellings.

### CONCLUSION

11.1 Thus, it has been observed that limited information on non-monetized production is available for certain points of time which can help in the preparation of estimates of GDP though not comprehensive ones. And again the flow of information thus obtained



over time or covering all the sectors is not continuous. With the available data, therefore, the estimates of non-monetized production are very rough. This has a serious limitation for the purposes of planning and policy formulation for which the data are meant. For, as Malima puts it, "while it may appear uneconomical to put scarce and badly needed statistical resources into an effort to get accurate figures for subsistence output, the need for fairly accurate estimates of subsistence production over time must still be faced. The planning of agricultural and general economic development in most african countries require a knowledge of the magnitude of subsistence production in the respective economies and how this item has been changing over time". Shand\* emphasizes by saying that subsistence production should receive at least as much attention in programmes of research and extension as is given to other (for example, export) crops.

11.2 It is, therefore, desirable if one wants to improve the reliability of the estimates to undertake surveys on crop cutting once after every five years, carry out HBS, agricultural censuses and livestock censuses regularly. And again once the surveys or censuses have been carried out, it is useful to have the data thus collected analysed and produced in the shortest time possible. The situation in Tanzania leaves much to be desired. The data collected from the last censuses have taken too long to be analysed and finally published. For example the 1971 agricultural census results were out in 1980, thus making the data rather obsolete for any meaningful computation for the situation in 1980 may have changed drastically from that of 1971 when the data were collected. There are many such instances where the time lag between data collection and data publication is too wide.

11.3 The estimates at constant prices still use 1966 as the base year up to 1980. These estimates require revision with use of a base year which is recent, but this cannot be done in the absence of new weights. The recent 1976/77 HBS results are not yet out by the time of writing this paper. The results of this recent HBS would have been useful in the revision with 1976 as the base year.

11.4 The limitations in LDCs are mainly lack of funds, qualified staff, transport facilities equipment and good office accomodation. Without qualified statistical personnel and funds the statistical office cannot carry out its functions properly i.e data collection, analysis and publication, thus there is unlikely to be any improvement in the quality of the data collected.

11.5 It is, therefore, desirable if the non-monetized production and other estimates in general are to improve, that the statistical office should be adequately staffed and funded so that regular surveys on say crop cutting and other censuses are carried out throughout the Country.

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\* Shand, R.T. quoted by Malima in his paper.

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## ESTIMATION OF THE CONTRIBUTION OF THE AGRICULTURAL SECTOR TO GROSS DOMESTIC PRODUCT IN DEVELOPING COUNTRIES

by J.J. MPOGOLO

In many developing countries, agriculture is the mainstay of the economies. As such, it needs to be given special attention in national accounts statistics. Some African countries, for instance, still have more than 90 % of the population living in rural areas with agriculture as the main activity. Agriculture contributes as much as 40 % of gross domestic product and more than 70 % of export earnings. With recently increased manufacturing activities (mainly food processing and textiles) the sector is still important as a source for inputs. Because of this, the whole development planning process should hinge on the evolvement of proper policies and strategies in respect of agriculture and, hence, the need to improve the statistics thereof. National accounts, being crucial aggregates for macro-economic analysis, should therefore be developed in such a way that due attention is given to improvement of statistics relating to contribution of the agricultural sector. The following then is a short account of the methods commonly used by countries of the African region to make the required estimates. It should, however, be borne in mind that what is stated here emanates from the author's experience in the anglophone countries of the region. But probably the approach is the same in the francophone ones and, indeed, in the developing world.

### CASH OR EXPORT CROPS

As the term implies these are crops which are grown primarily for sale either within the country or abroad. Because of this the sources of data are, of course, the markets themselves. In the majority of African countries there are quasi-public organisations called marketing boards or cooperatives which purchase these crops from farmers for sale in the domestic market or export. Comprehensive statistics on output are generally available from these boards. Another source of information are foreign trade statistics. Nigeria uses this source to obtain the exported component of cash crops which are also consumed in the households - the household consumption part having been obtained from household expenditure data. In Tanzania the home consumption of cash crops is considered negligible and as such output figures reported by marketing boards are assumed to represent total output. However, Kenya's approach is rather unique in that attempts are being made to combine direct

collection of data and reports of marketing boards. Every year two types of surveys are conducted :

- the Integrated Rural Survey (IRS) and
- Large Farms Survey.

The former covers farms up to 20 hectares whereas the latter covers larger farms falling in the farmer scheduled areas. This leaves those which are neither in the two categories. These are referred to as "gap farms". To the extent that their crops are sold to the marketing boards their output should be automatically covered.

The above statement on the treatment of cash crops in the developing world refers only to the output side of the problem. The input side is much more complex and comes up when one is deriving value added figures. A lot of assumptions and arbitrary decisions have necessarily to be made because of the fact that data in this area is lacking. In Kenya data on the structure and magnitude of inputs is obtained from the two surveys specified above, and the assumption is that the same mix and proportion applies to the other farms not covered by the surveys e.g. gap farms. A similar approach is taken in Tanzania. A postal questionnaire was sent to selected farms in 1968/69 to obtain data for 1966, 1967 and 1968. The assumption made is not only that the input proportion is the same for other similar farms, but also that figures for subsequent years can be extrapolated in the same proportion. Yet for some inputs it may be difficult to get a breakdown between farm and household use. This problem has been experienced by Nigeria; for instance, there it is not possible to get this breakdown from foreign trade in respect of insecticides. The approach adopted is to disregard insecticides as inputs into crop production.

Another well known problem, which is also mentioned in the SNA, is that of arriving at producer prices for valuation of agricultural output. The problem is quite serious here in that whether one takes output figures from marketing boards reports or exports the prices used in valuing quantities are, of course, those paid by the boards or f.o.b. port of exit respectively. Obviously, these points of valuating are far away from the farms where the crops originated and, as such, the prices contain an elements of transport and distribution margins which should conceptually be part of the transport and trade sectors. Unfortunately, no satisfactory solution has been worked out so far. Countries are still having to make arbitrary and, sometimes, subjective decisions. Tanzania, for instance, is valuing these crops at prices obtained in the regions where the crops originate, the assumption being that these will be closer to the producer prices. The Ministry of Agriculture compiles monthly a list of prices paid to farmers in the regions by crops, and this is made available to the Bureau of Statistics. Kenya, on the other hand, values the crops at prices paid by marketing boards ; but then says "they are as close to producer prices as it is possible to get". No explanation is given as to the adjustment made to bring them closer to producer prices.

Nigeria takes prices relating to the nearest village market for each crop and by state, and then working out a simple arithmetic average. However, in cases where rural or village prices are not available, urban prices are used instead.

#### OTHER CROPS

Unlike cash crops, there are no reliable statistics on crops consumed on the farms or partly sold on the market. Indeed the exercise in this area involves a lot of assumptions and guesses which, of course, invite questions on the validity of the estimates. But since production for own consumption is quite substantial in developing countries it is nonetheless necessary to attempt a valuation of their contribution to gross domestic product ; otherwise the GDP's of these economies will be grossly underestimated. Several approaches have been developed and, as to which method one follows, depends on the circumstances obtaining in the country in question.

In Tanzania the main source are records maintained by the Ministry of Agriculture. However, examination of household consumption data from the country's 1969 Household Budget Survey showed that the Ministry of Agriculture figures were grossly underestimated. As such, the HBS figures have been preferred. But the problem is that household budget surveys are expensive operations and cannot be undertaken every year. Most countries can afford to launch them only once in five or even ten years. The question then is : how does one extrapolate figures for the intervening period ? Assumptions, such as that the growth rate in respect of production for own consumption is the same as that of the population or 5 % for the marketed portion, are not uncommon. As for the cost of production, certain farm case studies were done in Tanzania and observed that it is about 10 % of gross output in respect of partly marketed crops and only 4 % for the rest. These percentages are being used for subsequent years probably until another such case study is made and is established that the cost structure has changed.

Kenya's approach is interesting. It is stated in the document on sources and methods that their Annual Census of Large Farms and the Integrated Rural Surveys also function as sources of information on the production of crops sold in local markets, consumed on farms, fed to livestock or given to labour. It is also observed that most of farm inputs in Kenya, with the exception of home grown seed and feed to livestock are purchased. As such the former inclusion of small farms in the traditional sector is no longer appropriate. At the same time it is asserted that IRS data has shown that almost 40 % of agricultural output is home consumed. It is not clear from the presentation, first as to how home grown seed and crops fed to livestock are estimated and, secondly, whether the 40 % home consumption result obtained from the IRS farms is assumed to apply to all other farms.

Before leaving the subject of crops, mention should be made of establishments which engage in more than one ISIC activity. For instance, it is common to find the growing of sisal and processing of sisal leaves into fibre done in the same plantation and under the same management ; similarly the growing of pyrethrum flowers and processing them into pyrethrum extract, tea leaves and manufactured tea, sugar cane and manufactured sugar, etc. Conceptually, there is no difficulty in the treatment required. The growing of sisal, pyrethrum flowers, tea leaves and sugar cane are clearly agricultural activities while the processing of sisal leaves into fibre, pyrethrum flowers into pyrethrum extract, tea leaves into manufactured tea and sugar cane into sugar are manufacturing activities. But in practice, the accounts of the establishments concerned tend to merge the two activities together and it is not easy to separate out. As such, a lot of judgment is involved and sometimes arbitrary decisions have to be made depending on circumstances. In the national accounts of Tanzania, for instance, attempts have been made to distinguish the two types of activity with respect to tea, pyrethrum and sugar. But it has not been possible, for practical reasons, to split the growing of sisal from processing of sisal leaves into fibre. The two activities have all been put under agriculture.

#### LIVESTOCK AND LIVESTOCK PRODUCTS

As is the general practice value added here involves estimation of the value of animal carcasses when slaughtered, physical increase in livestock and products thereof such as hides and skins, wool, milk, eggs etc. The classification of the physical increase into fixed capital formation or change in stocks should, of course, depend on the use to which the animals in question are put. In the case of cattle, for instance, increase in beef cattle is normally treated as a change in stock, while that of breeding and dairy cattle as fixed capital formation.

So far so good for the theory. But in practice it is difficult particularly for developing countries to get the above classification, let alone obtaining reliable data on livestock population. Because of this a national accountant is forced to have to make subjective judgments based on informed opinion, say, of the authorities dealing in livestock. In Tanzania it is the Ministry of Agriculture while in Nigeria it is the Livestock and Meat Authority. Kenya relies on reports of the relevant marketing boards ; but these are supplemented by data from the integrated rural surveys and censuses of large farms which are done annually.

One other problem in this area is that of estimating livestock and livestock products owned by nomadic population. It is quite common to find certain ethnic groups rearing large herds of cattle and shifting with them seasonally in search of grazing grounds. These are, for instance, the Masai in Kenya and Tanzania, Fulani in Northern Nigeria and to a certain extent the Bechuanas in Botswana. Obviously, where the livestock population falling in this category is considered insignificant one may perhaps ignore. But in a country where livestock is an important industry

(e.g. cattle in Botswana) it is essential to develop techniques of handling this problem. Of late, methods such as aerial photography and remote sensing are increasingly being used. Unfortunately, these only enable one to know the total livestock population ; the distribution by age, sex and into dairy, breeding and beef cattle remain unknown. Besides the cost of such operations may be beyond the reach of many developing countries. Perhaps what may be considered for the future is to apply these techniques quinquennially supplemented by small-scale field enquiries.

Before leaving the livestock sub-sector the reader's attention is drawn to the fact that the problems of inputs and valuation, referred to under crops, also apply here. As stated above, the national accountant relies on reports from the relevant marketing boards. Since these boards purchase livestock and/or livestock products at designated points, the reported prices are obviously different from 'farm-gate' prices. One has therefore to try an approximation to farm-gate prices as per national accounts practice. The difficulty of obtaining data on inputs is even more serious in the case of livestock. Only partial or guessed estimates are made. Kenya takes into account only manufactured feeds while Nigeria takes only the imported ones. Tanzania, on the other hand, takes a fixed percentage (15 %) based on informed guess. Of course, these approaches are far from satisfactory. Nevertheless, they represent what one would do under the circumstances.

#### FORESTRY

The contribution of forestry to gross domestic product is relatively small in many countries. But because of the importance of forestry in saw-milling, timber, paper industries and as a source of energy, it is certainly worth the effort. Generally, the valuation here involves increase in planted trees, trees felled, charcoal, firewood, posts and poles.

The valuation of physical increase in planted trees could be simply the total increase (expressed in cu.ft) multiplied by a certain price per cu.ft as is done in Tanzania. Both the number of trees and the assumed price per cu.ft are obtained from the Forest Division. On the other hand, one could introduce some refinements in this. Kenya for instance, values the increase in planted trees by ages to maturity. This, of course, involves and application of different prices to the different age groups and is done in respect of planted trees in the market economy. For the traditional sector, eg. collection of firewood and poles, one can assume a certain proportion of the population as being engaged and also the number of days in a year spent in these activities. Having done this, one can apply an assumed wage rate (eg. that which is applicable to workers on small farms). The extrapolation of the wage rate used can be done on the assumption that it grows at the same rate as the wages covered in regular employment surveys. Nigeria's treatment of firewood, in rural areas, is interesting. The commodity is considered a free gift of nature and excluded from gross domestic product. Though the author is admittedly not fully aware of the local situation in the country it seems an over sim-

plification. To the extent human labour is utilised to collect firewood, there should be a factor cost value and, if the activity embraces the entire rural population, the value involved could be substantial. Similarly valuation of charcoal can be tricky, particularly the quantity side. However, household budget surveys are generally useful in this area.

The problem of inputs in forestry is, not only that of unavailability of data as observed in other agricultural subsectors, but raises some conceptual issues. Generally, inputs in respect of planted trees are obtained from reports of forest departments, periodic surveys or are taken just as an assumed percentage of gross output. However, the treatment of forest royalties in some developing countries is a departure from the SNA recommendation. According to the SNA, royalties are a property income and need not therefore feature in production accounts. However, in some countries forest departments render certain essential services to private forest enterprises. As such, it seems appropriate to treat royalties as payments for services and, hence, inputs in forestry. This is the case in Kenya and Tanzania.

#### FISHERY

The contribution of fishery is relatively very small in many countries, amounting to less than 1 % of GDP. Conceptually, the output of this sub-sector should consist of evaluating fish catches (from sea and inland waters) at landing points. In practice, however, it is difficult to obtain data on total catches in a country. What is done therefore is to get the value of commercial catches, usually from records of Fishery Departments and derive the value of catches for own consumption as an assumed percentage of the former. Inputs for the commercial catches may be worked out as the cost of nets, diesel fuel for fishing boats and repair and maintenance of such boats. No allowance is given for inputs in respect of non-commercial catches as they are considered negligible.

But there is one problem in this sub-sector, namely that of obtaining appropriate prices for valuing quantities of fish caught. The problem is two-fold. Prices of fish vary considerably between different species and, as such, it is not appropriate to apply a uniform price to all the species. Secondly, the prices are supposed to be by landing points. Perhaps the Nigerian experience is worth citing here. It was observed by the Statistics Office there that it was not possible to get fish prices by species even by area of landing, let alone point of landing. The next best alternative resorted to has been to take an average of prices in the urban centres of a given state and use it to value fish production in that state. Of course, the national output is then obtained by summing up the state figures.

What is not clear from the Nigerian case is whether or not the average of the prices in urban centres of each state is weighted. If it is not, perhaps it would improve the estimates if weighting is attempted. This can be done by taking the quantities



of fish sold in the various urban centres in a state as weights to the relevant prices. Of course, the assumption here is that it is possible to get hold of the volume of fish sold in the centres in question.

#### HUNTING AND GAME TRAPPING

No reliable information is available for estimating the contribution of hunting to GDP. As such, only "guesstimates" have of necessity been resorted to, giving figures to a rough order of magnitude. Generally, the value of output consists of exports of game products, domestic sales of game products and cost of game licences issued. This, of course, covers game hunting and trapping for commercial purposes only. The value of this activity for own consumption is either assumed to be equal to the value of licences issued or can be taken just as a certain percentage of the commercial undertaking. Similarly, intermediate consumption can be taken to be equal to the value of services of professional hunters or as a fixed percentage of gross output depending on availability of data.

#### CONSTANT PRICE ESTIMATING

Converting current to constant price estimates adds some more dimensions to the data problem, namely identifying appropriate deflators and working out price indices thereof. As pointed above, there is a general lack of data in this sector particularly for the non-marketed portion. Consequently, when it comes to constant price estimates experience has shown that the application of the double-deflation procedure is more problematic in that one would have to obtain a set of prices, not only for gross output, but also for inputs. It is therefore advisable, in the case of the agricultural sector, to use the single-deflation method i.e. deflating only value added figures.

#### CONCLUSION

Agriculture is the most important sector in many developing countries. Some of the reasons for this are that it contributes the greatest share in GDP, it is a large foreign exchange earner and, of late, it has become an increasingly important producer of raw materials for agricultural based industries. As such, it is no wonder that the whole development process depends to a large extent on the strategies evolved with respect to agriculture in the countries development plans. Since statistics is generally accepted as an essential ingredient in sound planning, the crux of the matter boils down to improving agricultural statistics.

However, in grappling with the subject of estimating the contribution of the agricultural sector to GDP, experience has revealed the following problems :

1. Poor or non availability of output data in the traditional sub-sector.
2. Poor or non availability of data on cost of production (both material and labour)
3. Estimation of producer prices.
4. Treatment of multi-ISIC activities in a single establishment/plantation.
5. Identification of appropriate deflators and developing price indices thereof for constant price estimates.

These are crucial issues in improving valuation of agricultural output for national accounts in developing countries. Indeed it would be useful if future international effort and research in statistical methodology are directed to these areas.

## HOUSEHOLD SURVEYS IN THE TRADITIONAL AGRICULTURAL SECTOR OF MALAWI FROM 1965 TO 1986

by E.F. CHING'ANDA & A.T. MATEMBA

### I - INTRODUCTION

#### 1.1. Scope of Paper

1.1.1. This paper reviews the activities of the National Statistical Office (NSO) in data collection from households in the traditional agricultural sector of Malawi from 1965 to the present time. The paper also describes plans for data collection in this sector between now and 1986. This paper, therefore, covers NSO data collection activities over a period of 20 years.

1.1.2. For the sake of convenience this period will be subdivided into three different sections : the first section is from 1965 to 1970 ; the second section covers the period from 1971 to 1979 and the last section covers the seven years from 1980 to 1986. The subdivisions are more or less arbitrary but there are factors which differentiate them from each other.

#### 1.2. The National Statistical Office and the Statistical Act

1.2.1. The National Statistical Office was set up in 1964 soon after the country attained independence. The office has been under the Ministry of Finance since 1st July, 1981 while previously it was in the Office of the President and Cabinet.

1.2.2. The National Statistical Office operates under the Statistics Act (1967) which gives it powers to collect, compile, analyse, abstract and publish statistical information. Another important part of the law is the provision that any statistical enquiry conducted by any Government Department, Local Authority, Public or Statutory Body which requires returns from more than five respondents be approved by the head of the Statistical Service. The Statistics Act also emphasises the fact that the data collected under the Act shall be confidential and used for statistical purposes only. Penalties exist under the Act for those who wilfully refuse to provide required by a statistical enquiry. Details of the Statistical Act are available in the Laws of Malawi Chapter 27:01.

1.2.3. Before independence there was no central statistical organisation in the country which was then known as Nyasaland. Responsibility for statistics was vested in the Federation of Rhodesia and Nyasaland which had its Central Statistical Office (CSO) in southern Rhodesia, now Zimbabwe.

1.2.4. The CSO was not very active in the collection of statistical data from the rural sector. As far as agricultural statistics were concerned the CSO limited its activities to cash crops such as tea and tobacco which were produced by agricultural estates owned and managed by non africans. So there is very scanty statistical information on what was happening in the

traditional agricultural sector of Malawi before independence. The only statistical information available on the traditional agricultural sector was purchases of a certain range of crops from smallholders by the Farmers Marketing Board (FMB) now known as Agricultural Production and Marketing Board (ADMARC).

1.2.5. In the case of tobacco and cotton grown by smallholders, in addition to the FMB purchases data cited above, data on numbers of registered tobacco and cotton growers and estimated acreages under these crops were also available from the Ministry of Agriculture. For the rest of the smallholder crops such as maize, beans, groundnuts, millet, rice, cassava, etc, only the FMB purchases figures were available.

1.2.6. From the foregoing it may be appreciated that in 1964 the NSO was set up from scratch. There was at that time so much statistical data on rural households of the country lacking. The question of what statistical enquiry to do first must have arisen and the answer was to do a population census in 1965 but this was postponed to 1966 to allow for adequate planning. While plans for the population census were in preparation a series of household surveys collecting agricultural data from rural households began in March 1965.

## 2 - HOUSEHOLD SURVEYS BEFORE 1970

### 2.1. Surveys of Agricultural Smallholdings (SASH) 1965

2.1.1. In 1965 two SASH surveys were conducted in the Central and Southern Regions of the country. The Central Region survey was carried out between September and November 1965. The following were the objectives of these early surveys :

- i) to start statistical work in the traditional agricultural sector
- ii) to provide experience essential to the design of efficient and effective large scale agricultural surveys.

2.1.2. These surveys had one serious problem in common. This was the lack of a good sampling frame from the results of a recent population census. A sampling frame constructed from population census data was necessary because in Malawi there is no registration system of holding in the Traditional Agricultural Sector. The planners of the surveys recognised the problem they were faced with. The results of these surveys were, therefore, mainly presented as averages and percentages as opposed to grossed up estimates.

2.1.3. The following information was collected from sample households in 1965 :

Education of farm operators

Attendance at agricultural shows by farm operators

Size of household on holdings

Work animals and farm equipment

Farm expenditure by type and amount

Cash and subsistence crops grown in 1965

Receipts from sales of cash and subsistence crops during the previous 12 months

Animals owned by type

Sale of animals and amount of sales during the previous 12 months

Off-farm employment

Use of fertilizers on crops

Purchases of extra food for household use

Sources of water supply, etc.

## 2.2. Surveys of Agricultural Smallholdings (SASH) 1967

2.2.1 The major activity of the NSO in 1966 was the population census. This required nearly all available resources both financial and personnel. As a result, not much happened in agricultural data collection during this year but in 1967, after the population census, the SASH surveys were resumed. As in the 1965 series of these surveys, areas in the Central and Southern Regions were once again selected. The areas were of special agricultural interest which were earmarked for future agricultural development projects.

2.2.2 The Department of Agriculture had criticised the earlier SASH surveys of 1965 for attempting to provide agricultural information for large areas such as whole regions when it was very well known that there are variations in topography, soil types, rainfall, farm management even within a single district. In designing the 1967 SASH surveys this criticism was taken into account. In 1967 the surveys studied areas smaller than whole districts. These areas were called project areas.

2.2.3. In the Central Region three Project Areas were selected in Lilongwe District and one Project Area in Salima District. Another four Project Areas were selected in the Southern Region : one each in Chikwawa and Nsanje and two others each covering parts of Chikwawa and Nsanje.

2.2.4. The questionnaires used in the Central and Southern Regions were modified versions of the 1965 questionnaires. In addition to collecting the usual agricultural information the questionnaires were designed also to collect additional data on non-durable consumer goods ; and on loans, gifts and savings. The additional information collected was intended to meet data needs for national accounts purposes.

2.2.5 The survey results were presented as averages and percentages and grossed up estimates were given for hand tools, farm buildings, livestock, receipts and expenditure, area under cultivation for each Project Area. This was some improvement over presentation of data in the earlier reports for the 1965 SASH.

### 2.3. National Sample Survey of Agriculture (NSSA) 1968/69

2.3.1. The first nation-wide agricultural survey called the National Sample Survey of Agriculture was carried, on a sample basis, in the agricultural year of 1968/69.

2.3.2. The purpose of the NSSA was to obtain agricultural information on acreages under principle crops, on the yields and production of maize and groundnuts and on household income and expenditure. The data were needed for planning the development of agriculture in the traditional sector, for updating the national accounts and also to show patterns of income and expenditure of households in the rural areas.

2.3.3. Data collection for the NSSA was carried out in four phases. During the first phase household listing and initial interviewing of sample households were done by mobile field teams. Demographic data as farming activities of each household member were collected as well as numbers and types of livestock. Fields were measured and crops planted were recorded and yield subplots were laid in fields carrying maize or groundnuts. This phase lasted from December, 1968 to April 1969.

2.3.4. The second phase - April to June 1969 - was devoted to harvesting and weighing harvests from the yield sub-plots laid the first phase.

2.3.5. From July to August 1969, which was the third phase, a post enumeration survey was conducted in a sub-sample of 40 AEs selected from the 410 in the original sample. The objective of this exercise was to ascertain the completeness and relative accuracy of the data collected during the first phase. A team other than the one which carried out the first phase re-interviewed households for this phase and a third team was sent back to reconcile any differences noted.

2.3.6. During the fourth and last phase which lasted from September to November 1969 interviews were conducted to obtain information for the previous 12 months on farm equipment, farm buildings, livestock, farm expenditure, crop and livestock sales, expenditure on durable consumer goods, expenditure on services, and non-farm sources of cash income. Households were also asked about the previous week's expenditure on non-durable goods (excluding clothing).

2.3.7. The survey report, published in 1970, presented data for natural areas, districts and regions and was used by agricultural and other planners for quite a long time thereafter. The 1968/69 NSSA was not up-dated for 12 years though attempts were made, as will be described later, to update the NSSA from 1972 onwards.

2.3.8. All agricultural surveys carried out between 1965 and 1969 used very long recall period for some of the information. This is a serious problem where, because of illiteracy, survey respondents do not keep records. In addition to problems caused by lack of records is the delimitation of the recall period itself. References to agricultural seasons and activities may not be very helpful as there are no fine clear-cut boundaries between agricultural seasons which tend to imperceptibly run into each other.

2.3.9. Later surveys, those conducted from 1972, have tried to solve the problem of excessively long recall periods by collecting the relevant information at short intervals throughout the survey period. This has necessitated the use of enumerators who reside in the survey areas as opposed to mobile ones who were used up to the end of the 1960's. This method has one big disadvantage in that it is very expensive but until the level of literacy improves generally it is worth the while.

### 3 - HOUSEHOLD SURVEY FROM 1970 to 1979

#### 3.1. Surveys of Agricultural Smallholding (SASH) 1972 to 1977

3.1.1. For two years after the publication of the 1968/69 NSSA results, the NSO did not carry out any agricultural surveys in the rural areas of the country. After 1971, however, agricultural planners began to demand updating information on the findings of the 1968/69 NSSA. Data on yields and production of crops do not remain useful over a long period of time. And in a country such as Malawi where heavy investments are put into agriculture, the life span of such data is even shorter. There was felt a need therefore to update at least some of the findings at fairly short intervals, if not annually.

3.1.2. The plan adopted for updating the 1968/69 NSSA was to conduct NSSA-type of surveys in at least four districts each year beginning in 1972. The ideal thing would have been to do small annual sample surveys covering the whole country but this was not feasible because of lack of financial resources. This programme of surveys was given the name SASH after the surveys of the same name carried out in 1965 and 1967. The Ministry of Agriculture was to select districts to be surveyed each year.

3.1.3. During the first year, 1972/73, of the new SASH series four districts were covered in the Central Region. In 1973/74 only two districts were surveyed in the Northern Region and another two districts were surveyed in the Southern Region in 1974/75. After this the programme was stopped because of lack of funds as it was each year financed from savings on the NSO's annual budget and because of inflation it was impossible to continue with it.

3.1.4. One can say that the 1970s saw the role of the NSO in data collection from rural households decline slowly until it ended in 1975. It may be interesting to note that as the NSO's role was declining the Ministry of Agriculture increased its activities of data collection in the rural areas.

3.1.5. The Government of Malawi set up, beginning in the late 1960s several Agricultural Development Divisions (ADDs). The early ADDs were set up in Lilongwe, Salima, Chikwawa and Karonga Districts. Each ADD has an Evaluation Section which collects data for monitoring and evaluation of the activities of the ADD. Taken together these Evaluation Sections make up a significant force for data collection from the rural sector. By mid 1970s Evaluation Units had the capability of covering a great part of the country and in 1980/81 they were able to handle 50 % of the NSSA sample. But the Ministry of Agriculture still needed data from the remaining areas of the country which NSO was supposed to cover but could not because of lack of funds.

3.1.6. The Ministry of Agriculture was, however, pressing for agricultural data covering the country as a whole. From 1976 serious efforts were made to have agricultural surveys financed on development account because no meaningful surveys could be financed from savings on the NSO's regular annual budget.

3.1.7. A project submission for a pilot survey, a main survey and annual surveys to follow the main survey was undertaken. There were problems of finding a donor to fund the full programme as drawn up by the NSO. The Overseas Development Administration of Britain, however, kindly offered to finance the pilot and the main survey as part of agricultural development projects it had already committed funds for within the Ministry of Agriculture. The idea of carrying out annual surveys of agriculture was therefore dropped only to be revived later on by the World Bank.

3.1.8. Preparations for the pilot and the main NSSA survey were made jointly with the Ministry of Agriculture. Two pilots which had the objective of testing questionnaires and field procedures as well as to train field staff were carried out in 1978/79 and in 1979/80 and the main NSSA was conducted in 1980/81.

#### 4 - AGRICULTURAL SURVEYS FROM 1980 TO 1986

##### 4.1. NSSA 1980/81

4.1.1. The range of data collected in 1980/81 was wider than was the case in the 1968/69 NSSA. In all these were 10 different modules through which data were collected :

1. Household Composition Survey
2. Field Survey
3. Resources Survey
4. Crop Cutting Survey
5. Livestock Survey
6. Nutrition Survey (covering children aged 5 years or less)
7. Crop Storage Survey
8. Energy Survey
9. Extension Survey
10. Income and Expenditure Survey

The first six modules covered the full sample of 6,880 households in 344 EAs with 20 sample households each. The next three modules covered seven sample households in each EA and the last module covered four sample households in each EA.



4.1.2. The survey enumerators had a very heavy workload but it was difficult to exclude any module proposed by data users at the planning stage of the NSSA. The reason was simply that planners had been so long without data they needed from rural households. The proposed NSSA was an excellent opportunity for them to get the data which if they failed to get them no one could tell when the next chance might present itself.

4.1.3. A detailed time-table was worked out showing when each module would be used to collect data. Some of the modules were relatively simple requiring a once off interview. These are Modules 1, 4 and 9. Other modules such as Numbers 6, 7 and 8 required two interviews each, one interview in the wet season and a second during the dry season.

Modules 2 and 3 which involved measuring fields and crop cutting took a fairly long time - at least three months. But module 10 was the most intensive of all. Enumerators visited sample households weekly for a period of one year.

4.1.4. The NSSA sample was equally divided between the NSO and the Evaluation Sections of the ADDs. The NSO staff operated in areas not yet touched by the ADD's activities. Beginning from the time of the pilot surveys there has been close co-operation between the NSO and the Ministry of Agriculture through regular meetings to discuss the survey modules during the pilot and the main survey at the planning stage, and the progress of field work.

4.1.6. The ADDs processed the first three modules for their own internal use and the NSO will process all the modules except Number 8 which has already been processed by the Energy Unit of the Ministry of Agriculture. Processing of the NSSA at NSO is now in a quite advanced stage ; some information has started coming out. Data processing is expected to be over by the end of this year.

4.1.7. The final report(s) will present data for districts, ADDs and regions. The ADDs had requested data to be presented for Projects as well. A project is a major sub-division of an ADD and on average there are about four projects per ADD. It was thought that at the project level the data would not be reliable.

#### 4.2. The Future of Household Surveys in the National Statistical Office 1982 to 1986

4.2.1. The National Statistical Office has over the past five years been engaged in serious thoughts on how to collect data in the traditional sector of the country in order to meet the demands for data by planners.

4.2.2. The country has many Agricultural Development Projects hence the need for the National Statistical Office to provide data at National Level and Project Level to be used for (a) monitoring and Evaluation of the development project and (b) Policy formulation and monitoring of policy at National Level in the rural sector.

4.2.3. The NSSA 1980/81 was conducted with assistance of the British Government (ODA). The high level of success achieved was made possible by a

collaborative effort by the Ministry of Agriculture and the National Statistical Office. This has now been taken as a model for a continuous programme of Household Surveys in the traditional sector.

4.2.4. Following the end of the NSSA 1980/81 a programme of Annual Surveys of Agriculture (ASA) was launched in 1982 January to take us to December 1985. The annual surveys of agriculture are a first attempt by the country to collect data similar to that collected in the NSSA 1980/81, on a continuous basis in order to establish trends. The survey programme is being funded by the World Bank loan to the Malawi Government under the country's National Rural Development Programme Phase III.

4.2.5. All the surveys being conducted under the Annual Surveys of Agriculture are household surveys and aim at ensuring that data from the traditional sector of the country are made available on a regular basis to the planners. Some of the surveys in the traditional sector will need to be extended into the urban areas of the country and provision for this has been made in another bigger project being funded by the United Nations Development Programme (UNDP) under the country's IPF funding. This project is called the Strengthening of the Statistical Service.

## 5 - SAMPLE DESIGN AND SELECTION METHODS

5.1. It is difficult to summarise the types of design adopted in surveys conducted in the Traditional Sector of Malawi since the office was set up. The designs chosen all depend on the available sampling frame.

5.2. However, all surveys have adopted the idea of stratification by agricultural characteristics into homogeneous strata within the domains and then a selection has been taken within the domain. Before the first population census, after attainment of independence, in 1966 the village was usually chosen as the primary sampling unit. Villages were usually obtained from the tax census list. After the 1966 Population Census, Enumeration Area maps were then available and Census EAs were now used as a basis for selection of primary sampling units. The idea of cluster sampling has always been very attractive. Usually an Enumeration Area or village was selected, as the primary unit, the second stage selection was the household. In short multistage cluster sample design were usually adopted.

5.3. The selection of households was usually done by systematic sampling and the selection of villages or EA's by probability proportional to size.

5.4. We shall now describe the sample design adopted for two major surveys conducted nation-wide in the Traditional Sector of the country. The first survey was conducted in 1968/69 Agriculture Season and was called the National Sample Survey of Agriculture (NSSA) 1968/69. The second survey was planned to be conducted in 1978/79, ten years after the first nation-wide survey but due to other problem was postponed to 1980/81 :

### (a) The 1968/69 NSSA Sample Design and Selection Methodology

The country was stratified into what were called "Natural Areas" and "Rest of District". The country was administratively divided into twenty three districts. Thirty five Natural Areas were

demarcated. Within strata a multistage design was developed so as to be self weighting. The Enumeration Areas within strata were selected with probability proportional to size and one village within a chosen EA was selected using simple random sampling. The households were selected using systematic sampling.

(b) The 1980/81 NSSA Sample Design and Selection Methodology

A two-stage stratified sample was designed to present data for 24 administrative districts and 35 agricultural development project areas. To achieve this the country was divided into 213 areas called strata, which were considered to be agriculturally homogeneous. This number was reduced to 180 by excluding from the sampling frame strata where no or little smallholder activity took place. Three hundred and forty-four enumerators were then allocated proportionally between the strata. Each enumerator worked in one cluster which was selected with probability proportional to size from the strata. These clusters were the 1977 Population Census enumeration areas (EA's). Within a selected cluster twenty smallholder households were selected by systematic random sampling giving a possible total national sample of 6,880 smallholder households, though not all surveys were intended to cover the full sample.

6 - THE CONTRIBUTION OF HOUSEHOLD SURVEY DATA TO NATIONAL ACCOUNTS COMPILATION

6.1. The use of household survey data in National Accounts compilation has so far been very limited in Malawi (see paper by S.W.K. Mkandawire)

6.2. The main problems arise from the fact that National Accounts requirements on the construction of smallholder production, capital formation and consumption levels have had inadequate baseline data due to lack of (a) yield data estimates, the 1968/69 NSSA was confined to maize and groundnuts yields. (b) Continuous surveys which could provide these estimates. The agriculture patterns have been changing rapidly since the establishment of Agricultural Development projects in the country.

6.3. Many surveys in the traditional sector have been conducted since the 1968/69 NSSA Survey by both the Ministry of Agriculture, Agro-Economic Survey Unit and the Agricultural Development Projects. All these concentrated on small areas hence it has been difficult to consolidate their findings at the National Level.

6.4. Due to these problems the agricultural data used in the compilation of National Accounts has been estimated by the Ministry of Agriculture who to the best of their knowledge have provided data which appears reasonable. To this extent it has been difficult to say that the contribution of Household Survey data has been large.

R E F E R E N C E S

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7. National Statistical Office, Survey of Agricultural Smallholdings 1973/74 (Rumphi and Mzimba Districts) Cyclostyled.
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RECOMMENDATIONS FOR IMPROVING THE ESTIMATION OF  
RURAL INCOME AND WEALTH FOR TAX ASSESSMENT IN UGANDA

by ELIJAH S.K. MUWANGA-ZAKE

Currently the collection of agricultural and food statistics by the various agencies in Uganda, is beset with a number of problems. For instance the estimates made by the Department of Agriculture are subjective and hence suffer from indeterminate biases and errors. On the other hand, the estimates made by the Statistics Section, Ministry of Agriculture, though objective, contain both sampling and non-sampling errors. The Statistics Section actually does not cover all crops. So the graduated tax assessment forms could be used as an additional source of data on agricultural and food statistics. Providing a cross-check of the present data collection methods.

However, before one recommends its being used, one has to completely understand how it is carried out ; what sort of problems are met ; what are the possible errors ; and so on. Therefore, as phase one in the investigation into the possibility of collecting current agricultural and food statistics through the graduated tax assessment, I carried out a study and review of the methods of collection of graduated tax assessment data in twelve rural districts, namely ; -Mukono, Luwero, Mbale, Tororo, Gulu, Kitgum, Lira, Apac, Bushenyi, Mbarara, Kabale, and Rukungiri. These districts were subjectively selected but generally allowing for regional representation and balancing what the staff at the headquarters of the Ministry of Local Government considered to be "good" or "bad" districts as far as tax assessment was concerned. It was not possible to cover the whole country because of the expenses and time which would be needed. Also due to a fire at the Ministry's headquarters in 1978 and the Liberation War in 1978/79 some districts had very few records from which to get data. In fact we later dropped Bushenyi and Mbarara from the study due to lack of data.

In our preliminary work, we also visited four other districts namely : - Jinja, Kabarole (Fort-Portal), Mubende and Mpigi. These were, however, later also dropped due to the reasons mentioned above.

A number of districts were created in 1975 after subdividing some of the old districts and hence one can only get data since then. In fact data from the Ministry of Agriculture is still only available based on the old districts. Therefore, where one wants an analysis for a longer period, the districts have been re-combined into the old district as follows ; - Mukino and Luwero into East Buganda ; Gulu and Kitgum into Acholi ; Lira and Apac into Lango ; Bushenyi and Mbarara into Ankole ; and Kabale and Rukungiri into Kigezi. For consistency, where we re-combine those districts which were broken up, we refer to Mbale and Tororo as Bugisu, and Bukedi respectively. These being the old names of these districts which were themselves not broken up.

Most of the data used in the study are from the various district headquarters , or Ministry of Agriculture, Statistics Section. We also got some figures from the Coffee Marketing Board , Ministry of Animal Resources, Statistics Section, and the Institute of Public Administrations. Unfortunately, in a number of instances, gaps still remained in the data for which we could not get information, for these we had either to impute values or to resort to pure guess-estimates. Both of those situations, coupled with the fact that even the data from the various sources mentioned above is itself not all accurate, impair some of our conclusions. The final figures in a number of places can therefore only be taken as indicators rather than actual estimates.

Although there are these shortcomings of data inavailability, we are convinced that what we have done illustrates our points.

We must, perhaps stress that our main interest in this study has been in tax assessment as a purely statistical estimation problem of one's annual income, and hence his tax liability. This means that we have not studied such things as tax collection, scales, grades ; and indeed the whole taxation system in the country, etc., in the details they deserve.

## I - INTRODUCTION

In Uganda the following categories of persons are liable to pay Graduated Tax (G.T.) : -

- (i) Any man who is of the apparent age of 18 years or above on the first day of the year in which the tax assessment is carried out. For example, to be liable to pay G.T. for the year 1982 a person ought to have been of or above apparent age of 18 years on the 1st January 1981 ; the year when the assessment for the 1982 G.T. is carried out.
- (ii) All unmarried women of the apparent age of 18 or above (again on the first day of the year of tax assessment) and are in receipt of income arising out of employment , self-employment or property.
- (iii) Incomes of married women are added to those of their husbands when assessing husbands to G.T.

Certain categories of people can, however, be granted exemption. These include the old and sick, diplomats, visitors, students and all ranks of the armed forces.

Since most of the people in the rural areas do not keep records of their incomes or their production, these have to be estimated in order to determine their tax liability. The problem is therefore the estimation of a tax-payer's annual income.

### 1. Method of Graduated Tax Assessment

In order to determine the G.T. liability of an individual an Assessment Team (or Committee) goes out to count their property. In the rural areas, where our interest will lie, the Assessment Team is supposed to be made up of the District Tax Officer or Tax Enumerator, the sub-county, parish and sub-parish chiefs of the area.

The Team is supposed to make preliminary visits during which a list of people liable to pay tax (or Tax Register) is made or updated. These lists are then sent to the District Headquarters where they are compared to previous years' lists as a check for completeness. After checking and making adjustments, where necessary, the tax enumerators go out with the list to determine by direct observation, the income and value of property of people to be assessed. The information collected includes area of crops cultivated, number of coffee trees, number of livestock, and estimated income from these things, together with estimated income received from property and activities of various kinds. The information is filled on Tax Assessment forms (Appendix 1) which are sent to district headquarters for final assessment. Rate of tax

to be paid by a tax-payer is fixed by the Assessor (either the Assessment Committee, Assessment Officer or Inspector) and depends on the total estimated yearly gross income of the person concerned.

After tax-assessment the forms are returned to parish chiefs who inform the tax-payers by giving them Section J on the forms ; the top part is kept at the sub-county headquarters.

The assessment exercise is done every year and commences in August and goes on until December or January. The tax Enumerators are appointed on a temporary basis and given some training by the District Tax Officer for one or two weeks.

This is the method of tax assessment laid down by the Ministry of local Government in the "Graduated Tax Regulations, 1969". In our investigations in 14 districts we, however, found that these guidelines are not always adhered to. What is actually done in most districts looks very different.

## II- PROBLEMS ENCOUNTERED AND DEFECTS

A number of problems and defects affect the estimation of rural income and wealth for graduated tax assessment in Uganda. In general, we found that the effect of all these problems and defects is to lead to an under-estimation of income and hence under-assessment of tax liability making the government to lose potential tax revenue.

We shall discuss the major problems and defects under the following headings ; -

- (i) Incomplete Tax Registers
- (ii) Inaccurate and Incomplete Information
- (iii) Uncomparable Imputation Values between Districts
- (iv) Others.

### 2.1. Incomplete Tax Registers

It is generally known that not all people liable to pay tax are assessed, that is, the tax lists or registers kept at the sub-county and parish headquarters are incomplete. By law, every person who is liable to pay graduated tax is required to register. Some people of and above 18 years are not spotted and many times it is difficult to determine the ages.

In order to estimate the extent of under-registration in some districts we shall use the Potential Number of Tax-payers (PNT) in each district. This was estimated by the projected male population between twenty and sixty-four years\*.

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\* The minimum age for tax payment is 18, but due to data unavailability we could not get the information on the age group 18 - 54. As 2 years (18 and 19) are left out this may imply that the PNT is under-estimated.



To get the PNT per year for the period 1969-80, the proportion of males between 20 - 64 in the 1969 Population Census in each district was multiplied into the respective projected district total population. There are no figures by age or sex for the period. This proportion, it is hoped, has not changed significantly in the last ten years. Sixty-four was taken as the upper limit in order to try and exclude those persons who are partially or totally exempted for poverty arising from old age.

The figures as given include those males between 20 and 64 who are otherwise exempted, that is, the full-time students of and above the age of 18 ; all ranks of the armed forces ; visitors or non-residents in the area, etc. No attempt has been made to allow for these, again due to data unavailability, but the fact that we excluded the males of 18 and 19 should partly offset this inclusion.

Also, no allowances have been made to estimate the contribution of women and the migration effect to the PNT. This was also due to shortage of data. The effect of the former is that the PNT is under-estimated. The latter is especially important in as much as this is the group most susceptible to migration in search of better "pastures". Some districts are net receivers and others are net losers. For the former, the PNT is under-estimated and for the latter it is over-estimated. Also, the migration effect is most likely to be different for different years, especially if one takes into account the economic, social and political events of the last few years. For example, according to Ntozi and Gasana\*, Acholi and Kigezi have been net losers of migrants, and Bugisu and Bukedi net receivers.

The total effect of all these exclusions and inclusions is unknown, but it is hoped that the final PNT given broadly reflects the true situation. Also, the PNT was finally adjusted, in the light of the 1980 Population Census provisional results. The adjustments were generally graphically done by comparing the 1969 projected figure for 1980 to the one actually observed in the 1980 Census, and adjusting the previous years accordingly.

A look at Table 2.1.A (which compares PNT with Number of Tax-payers Registered-NTR) reveals that the extent of under-registration is highest in Bugisu, E. Buganda and Acholi. And as much as 59 % of potential tax-payers were not registered in Acholi in the year 1980. Also, 45 % were not registered in Bugisu for 1979. As noted above, Bugisu has been a net receiver of migrants from Sebei, Karamoja and Teso. Another fact revealed by the table is that this percentage under-registration seems to have generally been rising throughout the 70's. The rise is, however, very small until the late 70's except for Bugisu. This is most probably in part due to the fact that the projected male population, and hence PNT, has been rising much faster than NTR in most Districts. In Bugisu and Acholi where we have the highest percentage under-registration, the NTR seems to have stagnated throughout the period. In fact, in many districts there was an actual drop in the NTR in the years 1979 and 1980. This is most probably due to the generally confused situation in the country during this period.

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\* The Provisional Resultat of the Uganda Population Census 1980  
An Evaluation of the Growth Rate. Presented at the Workshop

For example, we understand that in 1980, many young men joined the then newly formed "people's militia" in Acholi and hence were exempted from paying graduated tax. Also a high number of Sudanese and Nubians fled the district during and after the liberation war. These two, of course, explain the big difference between PNT and NTR in that year.

The lowest levels of under-registration occur in Lango and Kigezi. The latter is particularly interesting because in almost all cases, NTR is higher than PNT which indicates over-registration. The low PNT is partly because the district had a relatively very low proportion of males between 20 and 64 in the 1969 population census and it has also had one of the lowest growth rates in the 70's (Ntozi and Gasana, *oc.cit.*)

In column (6) of Table 2.1A an attempt has been made to estimate the revenue lost due to under-registration. This is done by multiplying the number of taxpayers who have not been registered by the Average Tax Payment for the year. It is clear from the table that all the districts considered are losing a lot of revenue due to under-registration. For example, an estimated Shs.18 million were lost in E. Buganda in 1980.

## 2.2. Inaccurate and Incomplete Information

The information collected for the estimation of the yearly gross income is inaccurate and incomplete. In most cases all sources of income are not listed. Those with greater than one source of income tend to declare the one in which they receive least income. For example, if a person works in Kampala and has coffee and other land, the income from agriculture should be added to the salary to determine the yearly gross income.

The collectors of information seem to concentrate only on a few crops and livestock particularly on such "cash" crops as coffee, cotton, tea and tobacco and such livestock as cattle and goats. No information is collected on the "food" crops like maize, beans, finger millet and livestock like chickens and pigs unless they are produced on a "large-scale". Yet, especially of late, these other crops and stock have become very important sources of income. Currently, in many areas no crop is grown purely for food. Further, the assessment is based only on the crops and stock found on the day the enumerator visits the tax-payer, with no effort made to find out what has gone on for the rest of the year - some of the crops will already have been harvested, a person may have sold his cattle, etc. This is, therefore, a case of missing information and for this type of information, the Assessment Team depends on the memory and integrity of local chiefs in giving a true picture of what has gone on for the rest of the year. On the other hand, where the recording of property is done early in August or September, some crops will not have been planted and there is no system for getting planting intentions of tax-payers.

Where the recording of property is done entirely by the parish chiefs, it is subject to indeterminate biases and errors, due to favouritism, corruption, victimisation, and political ambitions. The education and experience of chiefs is such that very few of them are capable of making even a fair estimate of area of crops.

The effect of all these defects is to lead to under-assessment.

In table 2.2A an attempt is made to illustrate this. In column 1, we give the tax grade with the highest number of tax-payers (i.e. the Modal Grade) in each county and for the district. In order to get the Modal Grades, we took data on the Number of Tax-payers Paid (NTP) by tax grades as of the 31 December, at sub-county level. Then we computed the percentage of tax-payers in each grade for the sub-county, county and district. Now, the percentages for the sub-counties with the lowest and highest percentages in the Modal Grade of the county are given in column 2. Given in column 3 is the cumulative percentage from the lowest tax grade up to and including the Modal Grade for the county and district. All these figures are given for some districts for the years 1977 to 1980. We started with 1977 because this was the year when the present tax grades (Appendix 2) came into effect.

For example, for Aswa county in Gulu District in 1980 the grade with the highest percentage of tax-payers (i.e the Modal Grade) was Shs.250.00 (column 1) and 94 % of the tax payers paid a G.T. of Shs.250.00 or less (column 3). Also looking at the different sub-counties in this county we found that the sub-county with the lowest percentage in this grade in 1980 had 71 % of its tax-payers paying Shs.250.00 whereas the sub-county with the highest had 78 % of its tax-payers paying Shs.250.00. For the whole district in 1980 the Modal Grade was also Shs. 250.00 and 94 % of the tax-payers in the district paid this or less.

A look at the table reveals that the Modal Grade has been between Shs.100.00 and Shs.300.00 for this period for all the districts given. For Mukono and Kabale districts there has been a steady rise in the Modal Grade while Bugisu and Lira have been static. In column 2 we find many sub-counties where we have a very high percentage of tax-payers in the Modal Grade. There are many cases where more than 50 % of the tax-payers are in the same income bracket. In the absence of a survey to confirm such an equal distribution of income over such wide areas, we are more inclined to believe the only other possible explanation that there is a lot of arbitrariness in the assessment exercise, such that the assessment committee simply decides on a grade and "dumps" most people there. This could be the same grade as that of the previous year or a higher one. It is interesting to note that in almost all cases in Table 2.2A the Modal Grades are always either higher or similar to those in the previous year in all counties.

This "dumping" saves the chiefs complaints of either over or under-assessment as most people are in the same grade. The worst cases seem to be in Mukono and Gulu districts and the percentages in Mbale seem to be the lowest. Finally, column 3 illustrates the fact that most tax-payers are in the lower tax grades (i.e. the frequency distribution of tax payment is skewed to the right) because we find that the percentage of tax-payers who pay an amount equal to or less than the Modal Grade is very high in most cases. For example, 94 % of the tax-payers in Gulu district paid Shs. 250.00 or less in 1980 and 89 % paid Shs. 180.00 or less in Bushenyi in the same year !

In Table 2.2B we give the Average Tax Assessment. This is derived by dividing the Total Estimated Revenue by the NTR. Like the Modal Grades, these averages are still low, but they all display a rising trend in all districts. The highest averages are in Gulu and Luwero in 1980.

### 2.3. Uncomparable Imputation Values between Districts

A characteristic feature of graduated tax assessment in Uganda is its emphasis on assumed or imputed income. Apart from calculating tax liability on the basis of the actual income received by the tax-payer, an attempt is also made to estimate the income the tax-payer should have received from property and activities of various kinds in the year.

For graduated tax, income is imputed to the ownership of cattle, goats, participation in retail trade, selling of native medicines, etc. without any direct attempt at estimating how much income a particular tax-payer realised from such property or activity, e.g. a uniform rate is used for everyone carrying on a particular activity. The levels of imputed income are usually computed in the Department of Agriculture or at least with the help of the Department's staff in the respective districts.

When prices change, attempts are made to change the levels of imputed income, but this is not regular. For example, the rates in use in 1980 were set in 1977 for Kabale and Luwero ; 1978 for Lira ; 1979 for Apac, Mpigi and Bushenyi. Also in cases where adverse weather or disease affects the yield of crops, no account is taken of this after tax assessment. Obviously, it would be difficult to assess imputed value for every individual.

Though the tax grades corresponding to various income brackets are standardized between districts (Appendix 2), there does not seem to be any standardization as to the assessment of income from property.

In the study we compared the Imputation Values for various property for nine districts in 1980. The property was divided into crops, animals and business.

### Crops

An acre of coffee was valued at Shs.200.00 in Kabale, Shs. 2000.00 in Bushenyi ; about Shs. 3500.00 in Luwero and Shs. 7500.00 next door in Mukono. Yet the price of coffee is the same in all these areas.

As we mentioned earlier, not much attention seems to be paid to crops other than the "cash" crops. So that you find in a number of districts the same rates are used for "all other crops". This is very difficult to justify since these crops have different yield rates and price structures. Like in the case of coffee, the rates used in different districts for the same crops are not comparable at all. This type of incomparable rate appears for most of the other crops, especially the "food" crops. These differences can only be justified if the yields per acre were different ; i.e. if the yield rate for coffee in Mukono was 37 times that of Kabale !

This does not seem to be true. In Table 2.3A we give the yields for maize, plantains and cotton. From the table it is clear that, whereas the imputation value for cotton in Mukono is 15 times that in Kabale, actually the yield rates are the same. In fact, the largest differences in yield rate appear for plantains, where the rate in Bushenyi is almost 10 times that of Gulu (Acholi). Of course this is partly due to the fact that Plantains is not an important crop in Acholi.

Table 2.3.A Yield Rates for 1978 (Metric Tonnes/Hectare)

District/ Crop	E. Buganda (Mukono/ Luwero)	Bugisu (Mbale)	Bukedi (Torocco)	Acholi (Gulu/ Kitgum)	Lango (Lira/ Apac)	Ankole (Bushenyi/ Mbarara)	Kigezi (Rukun- giri/ Kabale)
Maize	2.7	0.6	1.4	1.2	1.2	0.9	1.5
Plantains	8.1	5.1	3.5	1.4	9.1	11.1	5.2
Cotton*	0.3	0.3	0.3	0.4	0.4	0.4	0.3

\* Figs. for cotton are for 1975

Source : Statistics Section, Ministry of Agriculture and Forestry

### Animals

The imputation values for animals are also similar to those for crops in that the same type of large and somewhat unjustifiable differences exist.

The imputation value for a cow, for example, ranges from Shs.6,000.000 in Tororo to Shs.100.00 in Kitgum and Mukono. Here one finds even neighbouring districts, where conditions are similar, with very different rates. For example, for a cow, Gulu is Shs. 1,300.00 when Kitgum is Shs.100.00 ; Lira is Shs. 1,000.00 when Apac is Shs.500.00 and Luwero is Shs.300.00 when Mukono is Shs.100.00 yet all these are next-door neighbours !

There are also some other interesting comparisons between the rates of different animals. You find a pig at Shs.200.00 and a cow at Shs.100.00 in Mukono and in Kitgum a cow is Shs.100.00 with a goat or sheep at Shs.50.00.

Except for poultry, most districts do not seem to differentiate between "exotic" and "local" breeds apart from Kabale. Yet the production is very different for these two.

### Business

Comparisons for businesses are not as straight forward as those for crops and animals. Here one has to take into account such things as the location, size, type of customers, etc. Also we appreciate the fact that in the absence of proper books of account, imputation values are much more difficult to arrive at. In fact, you find that a number of districts simply give a range of values, so that the actual rate for a particular tax-payer will be determined by the chief or whoever is doing the actual assessment.

Another factor, one has to take into account when comparing these values is that, as noted above, they were set in different years based on different prices\*. So that with the present high rate of inflation in the country, there are bound to be differences.

However, one notes that the lists or items for which values are given are not exhaustive for some districts, so that there is obvious need to make much more comprehensive ones.

Finally, from the interviews with the various district Tax Officers, it is obvious that some of them try to fix the imputations values on a net income basis ; that is, allowing for costs of production ; whereas others do it on a gross income basis. This probably explains some of the very large differences between rates for the same property in different districts.

### 2.4. Other Problems and Defects

Other problems and defects still affect the graduated tax assessment exercise. These include the following.

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\* In 1981 almost all districts revised their Imputation values. Unfortunately unjustifiable differences still exist. For example now a Banana plantation is valued at Shs. 15,000.00 per acre in Bushenyi District and at only Shs.5500.000 in Luwero and an exotic cow is Shs39,600 in Bushenyi ; Sh.10,000/- in Gulu and only Shs.1500.00 in Luwero.

- a) Outright favouritism and corruption by the various assessing officers.
- b) The information used in assessment of tax liability is very often not filled on the Tax Assessment Forms. In fact, in some cases due to shortage of stationery, the forms are not used at all. In these cases it is impossible to check assessments.
- c) Due to transport problems in very many cases the district tax office is not represented on the Assessment Committees. This is unfortunate because it has been observed that the presence of this representative makes the Committee much more cautious and hopefully leading to more accurate assessments.
- d) In most districts, Tax Enumerators are not used. The tax officers argue that, when they are used, the local chiefs side with their subjects to frustrate the Tax Enumerators, by, for example, not showing them some of the property.
- e) In some areas, the assessment exercise is not carried out every year. The tax-payers are simply told to pay the same rates paid the previous year.
- f) There is no standardization between districts as to the treatment of women. A number of districts do tax employed females, but not all. There is also confusion as to the treatment of unemployed wives who own otherwise taxable property. The property of these wives is often not added to that of the husband in the assessing of the husband to G.T.

### III - ESTIMATION OF THE EXTENT OF UNDER-ASSESSMENT

As demonstrated above, there is a lot of under-assessment of tax liability. In this section we shall attempt to estimate the extent of the under-assessment in the districts under study.

We have seen that under-assessment is mainly due to the following causes.

- a) Incomplete tax registers or under-registration ;
- b) Inaccurate and Incomplete Information ;
- c) Uncomparable Imputation Values between Districts ; and
- d) Other causes.

### 3.1. Incomplete Tax Registers

In Section 2.1 we estimated the extent of under-registration and in column (6) of Table 2.1A we showed the estimated revenue lost due to under-registration.

The estimated revenue lost is, however, most probably over-estimated because it is generally people with no holdings who are not registered as taxpayers. These people usually pay taxes below the Modal Grades and average because they usually have fewer taxable properties. So, using the average tax paid is actually over-estimating their tax liability. We could not adjust for this factor unless one carried out a survey and found the average tax liability of those who are not registered.

### 3.2. Inaccurate and Incomplete Information

In order to estimate the extent of under-assessment due to inaccurate and incomplete information, we divided areas of a number of major crops and numbers of animals, by the Number of Taxpayers on Register (NTR). This gives the average area per crop and average number of animals for each tax-payer. Imputation values in the various districts are then applied to these averages in order to get Total Imputed Income and consequently tax liability.

Because tax liability in the current year is assessed on ones income in the previous year, the averages as given are ahead by a year. This is because one's tax liability in 1980 is determined by one's property in 1979 so the averages on the row for tax in the year 1980 are actually what the tax-payer possessed in 1979. In Table 3.2A we give the averages, total imputed income and imputed tax liability. The last column gives the actual Average Tax Paid (ATP) for comparison.

The figures used for area under crops and numbers of animals are from either the Statistics Section or the Department of Agriculture, both in the Ministry for Agriculture. The estimates made by the Department of Agriculture are subjective and hence suffer from indeterminate biases and errors while those made by the Statistics Section are objective and therefore could suffer from both sampling and non-sampling errors\*. Also, we must point out that we have not imputed income to business, "other" employment and, of course, illegal activities like smuggling. This implies that the imputed income is under-estimated. On the other hand, dividing all the area under crops and number of livestock in the district by NTR, means that we have assumed that all this property is owned by only tax-payers. That is non-tax-payers do not own any property, which is obviously not the case. So in this respect we are over-estimating the income of the tax-payers. This, we hope, partly off-sets the earlier under-estimation.

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\* Methods of Collecting Current Agricultural Statistics in Uganda ; Muwanga-Zake, 1977.



The highest computed tax liability we get is for Bukedi. This seems to be mainly due to the high imputation value for cattle. Like in Section 2.1 under Incomplete Registers, one cannot get meaningful figures for Kigezi. This must be a result of the fact that for the crops and animals considered, the district has very low imputation values. Secondly, we did not include vegetables and Irish potatoes which are widely grown there and thirdly, we could not get the imputation value for sorghum, another widely grown crop.

We think the figures otherwise illustrate the point that the various districts are losing a lot of revenue because of inaccurate and incomplete information. The figures indicate that apart from Bukedi, the second biggest loss occurs in E. Buganda. A possible explanation is that here we have imputed a value to the ownership of plantains which most likely is not done during the actual assessment exercise since this is the staple food in the area. In fact, when you remove the value for plantains the imputed tax liability becomes Shs. 300.00 for 1976 to 1978 and Shs.250.00 for 1979 and 1978. These figures are close to the observed average paid and average assessed. (See Table 2.2B).

As we said above, we have not considered or imputed income to ownership of business. It may be possible to do this if one used the trading licences which are issued either by the district administrations or by town boards. We were, however, not able to do this mainly because of the transport problems which would be involved in getting the data, but this could be tried in future work.

In Table 3.2B, we give the estimated revenue districts would get if they used relatively more accurate and complete information. This is obtained by multiplying the imputed tax liability in Table 3.2A by NTR (Table 2.1A, column 1).

Table 3.2B : Estimated Revenue lost due to Inaccurate Information

	<u>E. Buganda</u>		<u>Bugisu</u>		<u>Bukedi</u>		<u>Acholi</u>		<u>Lango</u>	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
1978	123.8	48.1	30.7	19.8	99.3	19.1	29.7	13.3	48.9	14.1
1979	114.5	55.9	30.3	17.1	-	-	30.5	18.2	35.4	13.9
1980	114.5	50.7	-	-	85.6	19.2	26.4	11.2	68.2	16.7

(Mill. Shs.)

Key : (a) Estimated Revenue ; (b) Actual Revenue

Source : Computed.

Comparisons of the estimated revenue with the actual revenue collected for three years, reveals that all the districts considered here could at least double their tax revenue if they used relatively more accurate and complete information during tax assessment. In fact, Bukedi could raise its tax revenue by about five times !

### 3.3. Uncomparable Imputation Values between Districts

In Table 3.2A we used the imputation values currently used in the various districts in their respective districts. For example, we used the current values for Luwero, Gulu and Lira to get imputed tax liability in the former districts of E. Buganda, Acholi and Lango respectively. If one used imputation values currently used in Mukono, Kitgum and Apac on the averages obtained in Table 3.2A for E. Buganda, Acholi and Lango, again respectively, the results would be as in Table 3.3.A

Table 3.3A : Comparison of Imputation Values

Table 1.1: The 1979-80 and 1980-81 Survey of the 197												
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Key : (a) Total Imputed Income ;

(b) Tax Liability

Source : Computed from Tables 2.3A and 3.2A.

Except for Mukono and Luwero the other two pairs of districts give different results. The explanation is that Gulu is higher than Kitgum because a cow is valued at Shs. 1300.00 in the former and at only Shs.100.00 in the latter. Also, Lira has a higher imputed tax liability because the imputation value of a cow in Lira is twice that in Apac. So Kitgum and Apac are losing potential tax revenue because of relatively lower levels of imputation values.

The comparisons above give us an idea of the extent of losses in revenue for each pair of districts. In order to compare all the districts, one needs to use the same imputation values.

In order to get the same imputation values we took the highest rates on any item and applied them to the averages in Table 3.2A for the years 1979 and 1980. The results we got showed that the Total Imputed Income and hence tax liability were about the same for those districts under study. That is if one used the same imputation values the tax liability would be about the same for all these districts.

#### 3.4. Other Causes

Other causes could still lead to under-assessment of tax liability. Examples here include outright favouritism and corruption by the various assessing officers, especially the local chiefs. Also, many Tax Officers complained about interference by politicians in the assessment exercise. Some of these politicians insist that taxes be reduced and in some cases they are actually reduced.

It is however, our conviction that given complete tax registers, accurate and complete information filled on tax assessment forms and comparable levels of imputation values, these other causes could be greatly decreased if not eliminated completely.

#### 3.5. Conclusion

The conclusion one draws from the results of this chapter is that, given relatively more accurate and complete information for tax assessment, and comparable imputation values for all the districts, the average taxes assessed and the average taxes paid would generally be about the same. In other words, the relatively lower average taxes paid in some districts is simply a reflection of the extent of the inaccuracy and incompleteness of the information used in tax assessment and the size of the disparity in its imputation values compared to the other districts. There is currently such a diversity of production of potentially taxable commodities in the various districts which, if properly utilized, would lead to the narrowing of the gap in tax revenue between districts.

Finally, we must say that it looks like all districts are losing more revenue due to inaccurate and incomplete information and relatively low imputation values than due to under-registration (compare results in Table 3.2.B with those in Table 2.1A, column 6).

#### IV - RECOMMENDATIONS

It is clear from the foregoing that most of the revenue various districts are losing is due to wrong assessments. In fact, even those who pay their taxes are in a way defaulters, because most of them do not pay the correct taxes anyway.

Here we shall therefore attempt to make recommendations in order to rectify some of the defects we have identified above.

##### 4.1. Incomplete Tax Registers

A determined effort to register all persons liable to pay G.T. will have a number of advantages. First of all, it will help to ensure a more complete tax collection and hence increased revenue. Secondly, tax registers are used by other private and government institutions. For example, the Statistics Section, Ministry of Agriculture and Forestry, uses them as a basis for building up a rural frame or list of holders. Currently, very many people do not seem to be aware of their legal obligation to register as tax-payers. Most of the stress is put on tax payment. We therefore recommend that :

- a) While paying G.T. or during the assessment, the payers should be asked whether they have been registered and, if not, they should be registered immediately. Also, generally while talking about tax matters to the public, the various chiefs and politicians should also emphasize the fact that failure to register as a taxpayer can lead to prosecution just as the failure to pay the taxes.
- b) As more figures become available, say from the 1980 population census, the Potential Number of Tax-payers (PNT) should be computed in order to estimate the extent of under-registration in the various areas. If possible, PNT should be computed at sub-county level so that the district tax offices can find the sub-counties with the highest under-registration. For example if the Age-Specific growth rates of the population are available it will be possible to project PNT.

##### 4.2. Inaccurate and Incomplete Information

As illustrated in Chapter 3, the highest percentage of tax revenue the various districts lose, is due to the use of inaccurate and incomplete information during tax assessment. There is therefore urgent need to find a cure for this problem ; we therefore recommend that :

- a) The tax assessment forms should be more detailed in order to provide more information about the tax-payer. This expanded form will have a number of advantages :

- the information filled on the forms on tax-payers could be used by other government and private agencies as a source of data on rural areas,
- an expanded form would force a chief or whoever is recording property to write down some figure whether wrong or correct. Now if these people know that they face prosecution for giving wrong information, and in time if some people are actually prosecuted, eventually the situation should improve,
- if whoever is recording property wants to favour somebody, they will have to fill in the information in such a way that the imputed income falls in a particular tax grade. This sort of thing would become infinitely more difficult. In fact,, with the expanded form, property would be recorded without the people knowing or being aware of the subsequent tax burden.
- during tax assessment, it will be possible to compare with previous years' forms for a particular tax-payer as a check against under-reporting of property.
- there is a section on income of spouse and income from other employment which should catch those whose spouses are employed and those with double incomes.
- there are questions to check for the consistency of answers.

A suggested Tax Assessment Form is attached as Appendix 3. This could, however, be adjusted to fit particular situations. For example, in districts where livestock is more important than crops, the section on crops could be reduced.

- b) As mentioned in Chapter 2, in many areas the information concerning the tax-payers' income and property is rarely entered on the forms. Efforts should therefore be taken immediately to stop this practice. Whoever is doing the property recording, should be told that the forms must be completed. If a tax-payer has no taxable property at all, this fact should be entered on the form. Failure to fill in the form should also be treated and prosecuted as a case of giving wrong information.
- c) The expanded forms, plus the requirement that they have to be filled in will greatly reduce those biases and errors due to favouritism, corruption, victimisation and political ambitions. Unfortunately, the education and experience of chiefs makes many of them incapable of carrying out estimates of areas under crops and value of other taxable property. Most of the tax-payers do not know the areas either. To this end, therefore, a number of Tax Officers and Treasurers we talked to called for a re-introduction of the Tax Enumerators.

We also support this view because first of all, chiefs have many other duties to perform and as such cannot concentrate on tax assessment alone. Whereas, if properly trained, Tax Enumerators will only specialise in Tax Assessment.

Secondly, one is appointed to become a chief for various reasons and therefore may have no interest in this type of work, so while selecting candidates for Tax Enumerators, one can pick only those with an aptitude for information gathering. Thirdly, these people could be used by other government agencies to collect other rural based data.

Lastly, these people could act as representatives of the Tax Office because in many cases due to transport problems the office cannot be represented in all parishes, and yet it has been noted that the presence of a representative makes the committee much more cautious.

As we mentioned in Chapter 2, when Tax Enumerators work in their home parishes there is danger of favouritism and nepotism. On the other hand, if they work in strange parishes, the local chiefs could side with their subjects to frustrate the enumerator. This is a tricky problem, therefore, and our only recommendation is that both approaches should initially be tried in different parishes until the Tax Office decides on the better one.

We are convinced that the use of Tax Enumerators failed in a number of districts because their use was hastily approached, their recruitment and training was poor, their terms of service were unclear and they were very badly supervised. Also to some extent the chiefs, who recommended their removal stood to lose in their presence.

- d) Once selected, the Tax Enumerators should be given an intensive course in such things as area estimation both by eye-estimation and pacing ; valuation of "other" taxable property ; filling of the tax assessment forms ; possible problems met during tax assessment ; tax grades and any other matter related to tax assessment as a whole. The trainees should carry out some practice tax assessments for their trainer to ascertain that they have understood what they have been taught.

The training programmes could be worked out in collaboration with the Institute of Public Administration and the Institute of Statistics and Applied Economics.

- e) The inclusion of the respective Veterinary and Agricultural Assistants on the Assessment Committees is very commendable and we recommend its adoption by other districts. However the inclusion of politicians on these committees should be approached with a lot of caution.

- f) Even tax-payers who are employed in towns should be required to fill the tax assessment form before they are assessed, except those already paying the maximum rate. This should help to catch those tax-payers in towns who own taxable property elsewhere.

There is however, need to set up a system of exchanging information between districts, even between sub-counties in the same district in order to catch tax-payers with sources of income in different areas. Also, working wives should fill the form unless they can show proof that their husbands are already paying the maximum rate

- g) While changing to the new form, it should be tried out on a sample of parishes or sub-counties to begin with. This way we can find what questions are unclear and what gains they are compared to those parishes or sub-counties using the old forms and hence make the necessary adjustments. The re-introduction of Tax Enumertors could also be tried out first in a few parishes, again to compare the gains.
- h) Tax offices should compute and plot the average taxes assessed for a number of years by sub-county. These will also serve as an extra and quick check on the assessments. The Ministry headquarters will then keep the same plots by districts.
- i) In our investigations we were told of cases where a tax-payer would claim that some of the otherwise taxable property on the holding belong to people, who are exempted from taxation, for example children, wife, etc. In this way this property would not be included for the imputation of income. We think this is unfair particularly to those tax-payers with employed wives, because the income for the wife in this case will be added. Actually the law says that the incomes of married women should be added to those of the husbands when assessing husbands.

Therefore where, for example a man claims that a field of cotton or coffee belongs to the wife, income should be imputed for it and added to that of the man. We do not see any difference between a wife who wakes up to cultivate cotton or coffee and another who goes to teach. Both of them are doing so in order to earn some money.

The case when the tax-payer claims the property belongs to the children or a member of the armed forces is not straight forward and various approaches have been tried in a number of districts in order to get the revenue. For example in one district there is a charge for grazing cattle while in another the head of the kraal is taxed for all the cattle in the kraal irrespective of its owner. It is up to him to recover the money from the owners of the cattle.

Yet in another district once one is exempted from graduated tax they are told to give away all their taxable property to people who are liable to taxation. In one district the district council has decided that ... "a boy or girl whose age does not allow him/her to pay graduated tax but who runs a business or is employed by any department, are liable for taxation". In fact many of the district treasurers we met were of the opinion that all taxable property should be taxed even if the owner was exempted. We, however, are unable to fully endorse this suggestion, actually we cannot come out with a specific recommendation on the problem. We of course note that though a number of approaches mentioned above are rather high-handed and one doubts whether all of them are legal, they are out of genuine attempt by the various districts to catch those people making wrong claims.

#### 4.3. Uncomparable Imputation Values Between Districts

A number of districts could very easily and quickly increase their tax revenue simply by revising their imputation values. We therefore recommend that : -

- a) The values or rates be standardised for all districts within some regional or zonal setting for the following property : -
  - "Cash Crops"
  - "Food crops" for which prices are fixed by government i.e. "Controlled Produce".
  - Those crops, livestock and livestock product which are known to have somewhat standard prices or rates across the country. For example plantains, cattle, cassava, sweet potatoes ; chicken, milk, etc.

For these commodities, a range of values could be decided on centrally though the fixing of the actual rate could be left to the various districts in a region.

- b) Imputation values for businesses should continue to be determined in the various districts. There should however be coordination between districts and the list of those businesses liable to taxation should be centrally decided in the Ministry. This will avoid gross injustice and incomparability between districts.
- c) Generally the list of taxable property and imputation values should be made more comprehensive for all districts, this should again be co-ordinated through the Ministry headquarters.



- d) There is need to carry out studies to determine the minimum subsistence areas for "food crops" and "livestock numbers" for an average family, above which somebody will be taxed. This way we shall define what commercial means and thereby avoid the present arbitrary use of "large scale". A tax-payer will only be liable to pay taxes for the area and number of livestock above the minimum subsistence area. This of course contrasts with those earning employment income, who are taxed on gross income, but in all information gathering activities on agricultural production it is necessary to set the minimum limits in order to avoid arbitrariness.
- e) There is need to review the imputation values every year before assessment begins in order to allow for inflation. The values can be decided on centrally by the Ministry after consultation with the various district treasurers, tax officers, agriculture and veterinary officers and Ministry of Planning and Economic Development.

#### 4.4. Other General Recommendations

- a) The tax offices both at the Ministry headquarters and at the district level should be expanded. More specifically an Assistant Tax Officer (ATO) should be appointed in each office to be in charge of tax assessment. His duties should include : -

- training of tax enumerators,
- carrying out checks on tax assessments,
- deciding on imputation values with the help of the district agriculture and veterinary departments
- studying the problems involved and analysing data from tax returns.
- carrying out annual briefings of chiefs on tax assessment, and exercise in the districts.

Also four tax Officers or Inspectors should be appointed at the Ministry headquarters to be in charge of zones or regions. Their duties shall include : -

- co-ordinating of the duties of ATO's for example in the deciding of the imputation values
- compiling data and carrying out research in order to suggest improvements , and
- generally co-ordinating, organising and supervising the tax assessment exercise in the districts under them.

Since, we believe that tax assessment is a purely statistical estimation problem, we further recommend that the Tax Officers or Inspectors should be University graduates in Statistics or related subjects and that the ATOs should be holders of diploma or certificates in Statistics.

We should also add that currently the Statistics Section, Ministry of Agriculture and Forestry employs enumerators in some parishes in the collection of current agricultural Statistics (Mwanga-Zake, 1977 op. cit.) possibilities of using them in checking on tax assessments should be looked into.

Finally a workshop on the rehabilitation of statistics in Uganda held at the Institute of Statistics and Applied Economics, Makerere University in June 1980, recommended formation of a Permanent Field Organisation (PFO) in the Statistics Division of the Ministry of Planning and Economic Development (MPED). When this happens, we recommend that the Tax Officers or Assessors, and ATOs be appointed in the Statistics Division (MPED) and be seconded to the Ministry of Local Administrations and the districts, respectively. This will help in the co-ordination of the other data collection activities of the Statistics Division MPED but even more important the ATOs will be in a better position to carry out their checks of tax assessments without undue pressure from the local chiefs, politicians or district treasurers since they are not directly responsible to them.

- b) The present qualifications of Tax Officers at the district level should be reviewed. Many of the present Tax Officers have got into the jobs by rising through the ranks. Whereas this may be desirable as these will have a lot of experience, we are convinced that the job calls for a lot of innovation. The latter requires some academic background. To this end we recommend that in future Tax Officers be holders of Diplomas in accounting or related fields. Where necessary the present Tax Officers should be facilitated to go for further training. Either the district administrations or the Ministry itself should sponsor the qualified officers for training in the relevant institutions.
- c) In all data collection activities, strong and well-directed supervision reduces error. We, therefore recommend more frequent supervision and scrutiny of the tax assessment exercise at all levels. For example apart from checks of tax assessment by the ATOs, the Tax Officer himself and the various chiefs should carry out independent and surprise checks. If the people carrying out the assessment are told in advance that some areas will be re-assessed

for checking, this could improve their work as they will fear prosecution for giving wrong information. Unfortunately, in the past, transport problems have greatly hampered those who would have carried out the supervision. One, however, hopes that the situation will improve soon and as, it does, tax assessment and its supervision should be priority areas for the allocation of whatever transport is available at the district. After all, most of the money in the district treasury come from this exercise.

- d) There should be periodic briefings and reviews or seminars of tax-assessment both at the district and at the national level. The district seminars should include the chiefs and tax enumerators and should be organised by the ATO with the help of the Regional Tax Officer or Assessor. The national seminars should include all the district treasurers, Tax Officers and their ATOs and should be organised by the Regional Tax Officers.

During these meetings, problems of earlier years should be discussed with a view of finding solutions to them. For example, deciding on imputation values should be one of the major items on the Agenda for annual meetings of the Treasurers and Tax Officers. Further, notwithstanding our recommendation in 4.2.(c) above, the annual briefings for chiefs should cover area estimation and valuation of property because the chiefs will need knowledge of these while they carry out checks.

Also short-term refresher courses should be organized to up data the knowledge of the present officers.

- e) In the past, sub-counties and sometimes parishes, were graded by number of tax-payers in many districts. Therefore a good and hard-working chief had hope of being promoted to county chief. Currently no such thing exists, there is very little reward for doing a good job. Instead, chiefs are only punished when they fail to collect taxes in time. For example, by having their salaries stopped until they get all of them in. In fact, in one district we told that the chiefs arrest travellers to pay taxes and then claim that the number on register is completed and hence that they have no defaulters.

We therefore recommend that a reward system for both sub-county and parish chiefs be instituted in all districts whereby they would be specifically rewarded for : -

- collecting all the taxes assessed in their areas fastest ; and
- having generally carried out good tax assessment.

We think that the later especially could encourage them to increase their tax revenue every year partly by carrying out more accurate tax assessments. Of course the reward has to be substantial otherwise a chief will decide to take a bribe and reduce the tax liability if the bribe is higher. Also great care will have to be taken in deciding on "good tax assessments" in order to take into account such things as the initial performance of the chief, the percentage increases in tax revenue over the previous years ; how well the check tax assessments agree with those already carried out in his area ; etc.

- f) There is need for continuing and co-ordinated research on taxes in general and tax assessment in particular and any related matters like income and expenditure. Most of the recommendations we make in 4.3 above need more intensive and periodic studies. As stated in recommendation 4.4(a) above, the Regional Tax Officers should co-ordinate this research with the help of the ATOs, again this could be in collaboration with the Institute of Public Administrations and the Institute of Statistics and Applied Economics.

For example there could be continuing use and even refinement of the methods we have used in Section 3.2 above in order to estimate the extent of under-assessment as one of the checks of assessment.

- g) Many District Treasurers and Tax Officers that we interviewed recommend revision of the present graduated tax scales or grades upwards (See Appendix 2). For example some grades could be combined or, as suggested by the Tororo District Tax Officer the standard rate should be raised to Shs.140.00 and partial rate to Shs.60.00 ; also the maximum rate be above the present Shs.1,000.00 for very rich people. The proponents of changing the tax grades give a number of reasons ; namely : -

- "raising the standard and partial rates will encourage people to work" the people in Tororo argued.
- there are too many grades, which increases printing expenses.
- in most districts there are very few people paying the lowest tax grades, so raising these will not affect many people ; anyway ;
- the difference between some grades is Shs.10.00 or Shs.20.00 which is currently meaningless, the smallest difference between grades should be Shs.100.00
- a small increase in some of the grades, especially in the Modal Grade; can lead to substantial increases in the tax revenue.

- incomes of people have changed a great deal due to inflation since 1977 when the present grades came into existence ; these days the grades are effectively between Shs.550.00 to Shs.1,000.00, which makes the tax structure highly regressive and unfair.
- theoretically one of the ways of controlling inflation is to increase taxes, so revising the present rates upwards will help in the present fight to stop inflation ;
- because of inflation very many people earn in the excess of Shs.40,000.00 and therefore all of them paying a tax of Shs.1,000.00 is grossly unfair, especially when one considers that most of these people dodge paying income tax ; and
- the districts administrations are badly in need of more revenue to provide services which have now become very expensive.

Obviously a number of these reasons are valid, for example, as we stated in Section 2.2. above, in many districts most people are in the Modal Grade with a very small percentage below it. In fact in most of the districts we studied, the percentage of tax-payers paying a tax of Shs.100.00 or below was around 10 %. Secondly, if the grades were each to be raised by say Shs.50.00, it would mean an increase of Shs.500,000.00 in tax revenue for a district where you have 10,000 tax-payers in one grade especially in the Modal Grades. Thirdly a tax-payer may find it easier to believe you, if you told him that the grade of say Shs.300.00 which he has been paying has been changed to Shs.400.00 rather than if you told him that his income has increased so that now he has to pay Shs.400.00.

In either case he of course ends up paying Shs.400.00 but because people are more used to other things going up rather than their incomes, we have a feeling one may convince them much more easily using the first approach. Otherwise if the imputation values are revised every year they will take care of the inflation factor for those people with variable income. Besides, it will be grossly unfair to raise taxes for those people with fixed incomes. So what may be necessary is only to increase the maximum rate and create two or three grades at the top, in order to catch those people earning in excess of Shs.40,000.

We cannot fully endorse this recommendation because first of all we have not done much research on the point and even more important we feel that this is something with many socio-economic and political implications on

which we are not competent to advise. We therefore recommend that the point be studied further. For example Banugire\* suggest tapping more farm incomes in excess of graduated tax ceiling into the income tax net. That is rural people with incomes above a certain level should also be liable to Income Tax.

- h) Some countries, especially India seem to be operating successful tax register systems. We therefore recommend that some relevant officials at the Ministry headquarters and a few Tax Officers visit these countries to study how they operate their system with a view to adapting them to our situation.
- i) A number of our recommendations will result in increased expenditure by both, the Ministry headquarters and the districts. For example the enumerators will cost each district Shs.6000/-each (at Shs.1200 for 5 months) that is a total of about one million shillings for a district like Mukono with 180 parishes. The Regional Tax Officers will cost the Ministry an extra Shs.50,000.00 each per annum, again in salaries, allowances, housing, etc. However, the possibility of increased revenue resulting from correct assessments should by far off-set these costs. Also, the data on the assessment forms will be used by other government and private agencies; thereby saving them the money and time they would have otherwise spent to collect the same information. Besides, these officers themselves can be used by these other agencies, because in time their experience and knowledge of the areas in which they work will be invaluable for any survey. For example the ATOs and Zonal Tax Officers would also be used by the Income Tax Department. Also the information on the expanded assessment forms could be used by that department in order to catch those persons in the rural areas, liable to income tax who are currently escaping. Finally, we shall have created employment for these young men and women.
- j) In his work, Banugire (op. cit) recommended the integration of graduated tax with the Income Tax in both tax incidence and administration. He argued that this would automatically lead to the introduction of better trained personnel as well as better methods of work in graduated tax assessment. "Tax assessment for graduated tax and income tax should be co-ordinated in such a way that all sources of a person's income are identified either simultaneously or at successive stages in the administrative machinery. This is required to reduce tax evasion", he concluded.

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\*Studies on Taxation and Economic Development Vol. VII.  
Income Taxation in Eastern Africa (Uganda) : by Banugire, F.R.  
(International Bureau of Fiscal Documentation).

Whereas we full agree with the urgent need for co-ordination and cooperation between the graduated tax personnel and the Income Tax Department, we think their integration should be approached gradually.

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TABLE 2.1A  
INCOMPLETE TAX REGISTERS

E. BUGANDA (MUKONO/LUWERO)								BUGISU (MBALE)							
Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1969	-	213057	-	-	-	-	-	1969	-	85426	-	-	-	-	-
1970	-	218590	-	-	87.50	-	161742	1970	72595	87122	14526	20.0	80.00	1.2	72586
1971	175043	225570	50527	28.9	86.90	4.4	177862	1971	76150	89453	13303	17.5	73.40	1.0	74922
1972	188090	232826	44736	23.7	95.20	4.3	197019	1972	76410	91824	15414	20.2	81.00	1.2	76410
1973	195643	240407	44764	22.9	97.00	4.3	203389	1973	79256	94338	15082	19.0	84.90	1.3	79256
1974	211017	248238	37221	17.6	100.50	3.7	211431	1974	78360	96892	18532	23.6	85.50	1.6	78567
1975	188299	247659	59630	31.5	114.10	6.8	204930	1975	75932	99548	23616	31.1	87.60	2.1	75932
1976	206160	246798	39638	19.1	129.90	5.1	234335	1976	75186	101043	25857	34.4	98.30	2.5	75188
1977	192523	245668	53144	27.6	238.50	12.7	214681	1977	74273	103866	29593	39.8	158.10	4.7	74269
1978	206349	244255	37906	18.4	278.10	10.5	210501	1978	76662	106788	30126	39.3	294.90	8.9	76450
1979	208171	252568	44397	21.3	381.70	16.9	190516	1979	75857	109812	33955	44.8	266.20	9.0	75853
								1980	-	112954	-	-	-	-	-
BUKEDI (TORORO)								ACHOLI* (GULU/KITGUM)							
1969	89934	101194	11260	12.5	72.90	0.8	-	1969	-	84148	-	-	-	-	-
1970	81843	102617	20617	25.4	80.90	1.7	-	1970	-	86535	-	-	-	-	-
1971	86368	104690	18322	21.2	80.90	1.5	-	1971	-	89455	-	-	-	-	-
1972	95246	106782	11536	12.1	78.40	0.9	-	1972	65997	92485	26488	40.1	70.90	1.9	-
1973	96769	108952	12183	12.6	74.10	0.9	-	1973	69461	95660	26199	37.7	64.40	1.7	-
1974	102086	111179	9093	8.9	-	-	-	1974	71493	98962	27469	38.4	86.50	2.4	-
1975	102671	113425	10754	10.4	-	-	-	1975	73627	102427	28800	39.1	87.50	2.5	97798
1976	103255	116995	13740	13.3	94.40	1.3	103255	1976	73343	98542	25199	34.4	90.60	2.3	-
1977	106621	120644	14023	13.2	133.30	1.9	106621	1977	71798	96242	24444	34.0	197.70	4.8	73898
1978	110302	123155	12853	11.7	173.50	2.2	110302	1978	74344	97662	23318	31.4	207.70	4.8	-
1979	108648	125703	17055	15.7	183.10	3.1	-	1979	76362	101170	24808	32.5	398.10	9.9	72965
1980	106993	128310	21317	19.9	192.60	4.1	106993	1980	65930	104817	38887	59.0	255.20	9.9	61800

\* Due to looting in the Liberation War in 1979 most of the figures for Kitgum were not available and hence had to be guess-estimated.

TABLE 2.1A - cont'd.

LANGO (APAC/LIRA)								KIGEZI (KABALE/UKUNGIRI)							
Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1969	-	97895	-	-	-	-	-	1969	99548	88392	-	-	58.80	-	87104
1970	-	-	-	-	-	-	-	1970	99181	89758	-	-	61.30	-	85889
1971	-	-	-	-	-	-	-	1971	101063	91627	-	-	61.20	-	94312
1972	-	-	-	-	-	-	-	1972	105244	93523	-	-	74.80	-	94100
1973	105252	108238	2986	2.8	87.90	0.3	105252	1973	101436	95487	-	-	70.80	-	101436
1974	108159	111208	3049	2.8	80.20	0.2	108159	1974	105933	97493	-	-	78.50	-	98347
1975	113398	115102	1704	1.5	86.90	0.1	113398	1975	103979	99566	-	-	79.80	-	97955
1976	115485	118586	3101	2.7	86.50	0.3	115485	1976	103262	101680	-	-	84.50	-	99511
1977	111553	121932	10379	9.3	127.40	1.3	111551	1977	105849	103849	-	-	183.00	-	103761
1978	122351	125404	3053	2.4	140.10	0.4	122351	1978	106433	106072	-	-	249.40	-	104478
1979	117992	129010	11018	9.3	249.70	2.8	117992	1979	108798	108364	-	-	282.80	-	107618
1980	124010	132694	8694	7.0	221.60	1.9	124010	1980	111393	110710	-	-	308.70	-	101099

Key : Column (1) - Number of Tax-payers Registered - NTR  
 (2) - Potential Number of Tax-payers - PNT  
 (3) - Under-registration = (col. (2) - col. (1))  
 (4) - Percentage Under-registration :  $\frac{\text{col. (3)}}{\text{col. (1)}} \times 100$   
 (5) - Average Tax Paid :  $\frac{\text{Total amount Collected}}{\text{NTR}}$   
 (6) - Estimated Revenue Lost = (Col (3) x Col (5))  
 (7) - Number of Tax-payers Assessed - NTA.

TABLE 2.2A MOST PEOPLE IN THE LOWER TAX GRADES

					MUKONO DISTRICT								
Year	Country	Modal Grade (MG)	Range of % in MG	Cum % Age	1978			1979			1980		
1977	Mukono	180	39-51	89	180	22-51	49	300	52-63	73	300	40-70	83
	Ntenjeru	140	59-69	64	180	50-69	62	300	39-64	58	300	36-66	67
	Baale	140	59-72	63	180	53-67	63	300	57-71	85	300	31-65	70
	Buvuma	140	50-70	65	250	40-67	93	250	36-55	57	250	30-35	71
	Buikwe	140	29-63	53	180	31-69	47	300	30-59	74	300	31-53	81
	Nakifuma	-	-	-	-	-	-	-	-	-	300	47-67	59
	District	140	-	-	180	-	-	300	-	-	300	-	-
MBALE DISTRICT													
1977	C. Bugisu	140	10-29	-	180	14-35	-	180	15-36	-	180	22-37	68
	S. Bugisu	180	16-33	-	300	10-24	-	300	15-23	-	300	14-24	74
	Manjiya	180	5-41	-	250	12-21	-	250	12-26	-	180	18-36	76
	Budadiri	180	2-35	-	180	14-32	-	180	19-36	-	180	13-36	80
	Bulamburi	180	13-33	-	250	10-24	-	180	11-29	-	180	7-26	85
	District	180	-	97	180	-	41	180	-	46	180	-	62
TORORO DISTRICT													
1977	Bunyole	100	43	64	180	26	88	180	53	74	180	59	79
	Butebo	100	35	53	180	60	84	-	-	-	180	28	68
	Kibuku	80	34	39	140	41	79	-	-	-	180	33	96
	Samia	80	49	52	-	-	-	-	-	-	180	42	74
	Budaka	110	31	80	140	32	58	-	-	-	140	28	68
	Pallisa	100	29	45	140	28	66	-	-	-	180	42	97
	Tororo	110	30	64	180	36	89	180	21	53	180	51	79
	W. Budama	100	42	67	140	33	82	140	28	46	180	22	77
	District	100	30	56	140	26	61	180	37	65	180	36	78

\* Could not get data at sub-county level.

Table 22A - cont'd.

GULU DISTRICT

<u>Year</u>	<u>County</u>	<u>Modal Grade (MG)</u>	<u>Range of %</u>	<u>Cum % Age</u>	<u>1978</u>			<u>1979</u>			<u>1980</u>		
1977	Aswa	-	-	-	250	62-80	85	250	41-84	68	250	71-78	94
	Kilak	-	-	-	250	37-61	88	250	14-78	61	250	71-82	97
	Omoro	-	-	-	250	39-55	89	300	32-64	72	250	57-86	90
	Nwoya	-	-	-	-	-	-	300	28-53	65	250	76-88	95
	District	140	-	70	250	-	84	250	-	49	250	-	94

LIBRA DISTRICT

1977	Dokolo	-	-	-	-	-	-	-	-	-	100	66-82	79
	Erute	-	-	-	-	-	-	-	-	-	100	56-86	77
	Moroto	-	-	-	100	01-71	-	100	00-71	-	140	04-68	69
	Ofuke	-	-	-	100	34-69	-	100	37-67	68	140	05-76	59
	Kioga	-	-	-	100	06-67	-	100	07-67	51	-	-	-
	District	100	-	76	100	-	57	180	-	46	100	-	48

KABALE DISTRICT

1977	Bufumbira	100	17-59	59	250	36-64	72	250	27-57	39	300	12-61	84
	Ndorwa	110	07-63	48	250	06-63	61	300	18-70	77	300	18-64	77
	Rubanda	140	07-60	62	250	10-56	48	300	15-40	61	300	17-37	74
	Rukiga	140	16-49	62	250	14-60	65	300	19-40	71	250	20-50	56
	District	110	-	52	250	-	61	300	-	63	300	-	82

BUSHENYI DISTRICT

1977	Sheema	-	-	-	-	-	-	-	-	-	180	-	85
	Rushenyi	-	-	-	-	-	-	-	-	-	180	-	77
	Ruhinda	-	-	-	-	-	-	-	-	-	140	-	86
	Igara	-	-	-	-	-	-	-	-	-	140	-	93
	Kajara	-	-	-	-	-	-	-	-	-	180	-	58
	Bunyaruzuru	-	-	-	-	-	-	-	-	-	180	-	92
	Buhweju	-	-	-	-	-	-	-	-	-	140	-	78
	District	-	-	-	-	-	-	-	-	-	180	-	89

TABLE 2.2B

## AVERAGE TAX ASSESSMENT (SES)

YEAR	MUKONO LUWERO <sup>1</sup> (E. BUGANDA)		MBALE (BUGISU)	TORORO	GULU KITGUM (ACHOLI)		APAC LIRA (LANGO)		KABALE RUKUNGIRI <sup>11</sup> (KIGEZI)	
1969	-	-	-	67.70	-	-	-	-	50.20	-
1970	-	-	77.60	76.70	-	-	-	-	50.40	-
1971	94.70	-	68.30	-	-	-	-	-	60.90	-
1972	97.60	-	75.30	75.20	70.90	-	-	-	63.30	-
1973	96.40	-	76.90	76.30	64.40	-	-	70.70	65.60	-
1974	93.80	-	82.10	76.70	86.50	-	-	75.80	66.10	-
1975	110.20	96.10	86.70	-	86.00	75.70	78.00	72.00	73.90	83.00
1976	107.60	113.90	90.70	78.80	104.20	79.20	77.90	80.90	82.50	95.70
1977	175.90	221.80	149.00	145.60	178.70	136.60	132.60	124.00	147.10	179.30
1978	197.40	258.00	261.00	139.60	220.00	154.00	128.20	112.30	180.60	183.30
1979	256.70	330.50	290.20	197.10	288.00	243.30	132.60	135.30	274.90	214.20
1980	265.20	337.50	-	197.90	354.00	214.70	176.40	219.30	296.10	228.60

1. Luwero, Apac and Rukungiri Districts started in 1975.

TABLE 3.2A - AVERAGE AREA AND NUMBER OF ANIMALS PER TAXPAYER AND IMPUTED INCOME

BUGANDA (Aera in Acres)

x	Cotton		Maize		Beans		Finger Millet		Sorghum		Plantains		Coffee		Cattle		Goats		Sheep		Total Imputed Income	Tax Liability	Average Paid
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)					
e	Av.	Imputed																					
ar	Area	Income																					
76	0.5	750	0.2	-	0.2	-	0.1	-	+	-	2.5	5000	1.0	5000	2.0	600	0.2	-	0.1	-	9350/-	600/-	129.90
77	0.3	500	0.2	-	0.3	-	+	-	+	-	2.7	5000	0.9	3000	0.7	900	0.4	-	-	-	9400/-	600/-	238.50
78	0.3	500	0.1	-	0.1	-	+	-	+	-	2.5	5000	1.0	3000	2.1	600	0.2	-	0.1	-	9100/-	650/-	278.10
79	0.2	300	0.3	-	0.2	-	0.1	-	+	-	2.6	5000	0.9	3000	2.1	600	-	-	0.1	-	8900/-	550/-	381.70
80	-	(300)	0.1	-	0.1	-	+	-	+	-	2.5	5000	0.8	3000	2.2	600	0.3	-	0.1	-	8900/-	550/-	336.00

KEDI

76	2.9	1800	0.2	960	+	-	0.5	800	+	-	1.6	-	-	-	1.2	6,000	0.8	600	0.8	600	10,760/-	650/-	94.40
77	2.4	1500	1.0	4800	0.1	-	2.0	3200	0.2	-	1.5	-	-	-	2.2	12,000	1.0	600	0.4	300	30,500/-	900/-	133.30
78	2.5	1500	0.8	4800	0.2	-	2.6	4000	0.2	-	1.5	-	-	-	2.0	12,000	1.1	600	0.5	300	31,300/-	900/-	173.50
79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183.10
80	2.0	1200	0.3	1440	+	-	1.0	1600	0.1	-	1.3	-	-	-	2.3	12,000	1.1	600	0.5	300	25,240/-	800/-	192.60

GISU

76	0.4	120	0.9	300	0.7	300	0.9	300	0.2	-	4.7	510	0.6	3000	1.4	600	0.5	50	0.2	-	5180/-	400/-	98.30
77	0.3	90	1.6	450	1.5	450	0.6	180	0.1	-	1.9	600	0.8	4000	1.8	700	0.8	50	0.3	-	6520/-	500/-	158.10
78	0.3	90	1.1	300	0.9	300	0.3	90	+	-	2.0	600	0.6	3000	1.7	700	0.8	50	0.3	-	5130/-	400/-	294.90
79	0.2	60	3.4	1050	2.4	750	3.9	1200	0.3	-	2.1	600	0.3	1500	1.7	700	0.8	50	0.3	-	5910/-	400/-	266.20
80	-	-	1.0	300	1.3	400	0.7	210	0.1	-	1.9	600	0.8	4000	1.8	700	0.6	50	0.2	-	6260/-	500/-	-

HOLI

76	1.0	500	0.3	-	0.2	-	3.2	-	2.7	-	0.2	-	+	-	3.4	4300	1.4	420	1.3	390	5610/-	400/-	90.60
77	0.7	450	1.3	-	0.3	-	1.3	-	1.2	-	0.2	-	+	-	3.6	4600	1.7	510	1.4	420	5980/-	400/-	197.70
78	1.5	750	0.8	-	0.2	-	1.7	-	1.2	-	0.2	-	+	-	3.3	4200	1.2	360	1.2	360	5670/-	400/-	207.70
79	1.1	500	0.3	-	0.1	-	1.1	-	0.9	-	0.2	-	+	-	3.4	4300	-	(360)	-	(360)	5520/-	400/-	398.10
80	1.1	500	0.4	-	0.2	-	1.1	-	0.8	-	0.2	-	+	-	-	(4300)	-	(360)	-	(360)	5520/-	400/-	255.20

NGO

Tax in the Year	cotton		Maize		Beans		Millet		Sorghum		Plantains		Coffee		Cattle		Goats		Sheep		Total Imputed Income	Tax liability	Average Paid
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)			
Av. Imputed	Area	Income																					
1976	0.9	650	0.3	-	0.3	-	2.7	-	1.1	-	+	-	+	-	3.3	3300	1.6	320	0.6	120	4390/-	300/-	86.50
1977	1.1	650	1.2	-	1.6	-	1.8	-	1.2	-	+	-	+	-	3.4	3400	1.0	200	0.4	80	4330/-	300/-	127.40
1978	1.8	1200	1.1	-	1.5	-	1.4	-	1.1	-	+	-	+	-	3.4	3400	1.9	380	0.8	160	5140/-	400/-	140.10
1979	1.2	650	0.4	-	0.3	-	0.6	-	0.2	-	0.2	-	+	-	3.6	3600	-	(300)	-	100	4650/-	300/-	249.70
1980	-	(650)	0.4	-	0.6	-	0.8	-	0.6	-	0.1	-	+	-	6.9	6900	-	(300)	-	(100)	7950/-	550/-	221.60

IGEZI

1976	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1977	+	-	0.6	-	1.0	-	0.2	-	0.6	-	0.6	120	0.04	-	1.3	200	1.3	50	0.6	30	-	-	183.00
1978	+	-	0.5	-	0.4	-	0.2	-	0.6	-	0.6	120	0.01	-	1.3	200	1.2	50	0.7	40	-	-	249.40
1979	+	-	0.9	-	0.8	-	0.2	-	0.6	-	0.6	120	0.03	-	-	(200)	-	(50)	-	(50)	-	-	282.80
1980	+	-	0.4	-	0.6	-	0.1	-	0.4	-	0.5	100	0.01	-	1.2	200	1.3	50	1.2	50	-	-	308.70

Key : - Not available

+ Average Area less than 0.1 Acre

( ) Estimate



SESSION 2

L'INTEGRATION DE LA COMPTABILITE DES UNITES  
DANS LA COMPTABILITE NATIONALE

par Monique ANSON-MEYER

La nécessité d'une comptabilité nationale devient de plus en plus pressante dans les pays africains, que ceux-ci veuillent dresser des plans, qu'ils désirent répondre à des questionnaires ou fournir des documents à des organismes internationaux.

Cette comptabilité nationale apparaît tout à la fois comme un moyen permettant d'accroître la rationalité dans l'utilisation des moyens dont dispose le pays, comme un instrument de contrôle et d'appréciation des mesures de politique économique et, comme une source de documentation indispensable dans les relations entre les pourvoyeurs d'aide et les apporteurs de capitaux.

Or, quelle que soit la manière dont on l'envisage, une telle comptabilité vise toujours à fournir, dans le cadre d'un modèle simplifié de l'activité économique, des données retraçant le comportement d'agents au cours d'une période déterminée. Ces agents ne sont autres que les différentes unités de production regroupées selon des critères variables, qu'il s'agisse de privilégier les caractéristiques de l'activité productive pour les agents branches, ou les éléments institutionnels pour les secteurs institutionnels du Système de Comptabilité Nationale des Nations Unies (S.C.N.).

Contrairement à ce que l'on fait accroire parfois, il ne saurait y avoir de rupture entre ce qui décrit les comportements des unités de production (1), à savoir leur comptabilité et, ce qui retrace le comportement de l'ensemble qu'elles forment : la comptabilité nationale. La seconde ne présente rien d'autre que les éléments consolidés enregistrés de manière plus détaillée par la première.

Si élaborer une comptabilité nationale, surtout en Afrique relève de la gageure, la normalisation comptable au niveau de l'entreprise a eu, dès ses débuts, comme objectif, plus ou moins précis et plus ou moins lointain, le passage aux comptes nationaux.

---

(1) Etant donné que nous raisonnons dans le cadre du SCN tous les agents sont exclusivement ou partiellement des producteurs.

L'horizon qui, pour l'instant demeure partiellement un idéal, serait de pouvoir effectivement partir des unités pour dresser les comptes des agents du SCN, puis les comptes qualifiés par lui de consolidés (1). Il faudrait pour cela que le PCG des unités et le cadre comptable du SCN constituent un ensemble intégré et que les règles d'enregistrement des opérations y soient, sinon identiques, du moins conciliables.

Sans doute, ne s'agit-il pas d'exiger d'unités qui, en dépit d'interventions croissantes de l'Etat, relèvent d'un système d'économie libérale, de tenir une triple comptabilité comparable à celle imposée aux unités soviétiques et permettant la transmission, le contrôle de l'exécution des données du plan par les organes de direction économiques. Il s'agit simplement d'assurer dans les unités des enregistrements selon des règles et des cadres identiques ou du moins compatibles, de manière à pouvoir en faire des sommes et à confronter les comptes des unités.

Si les pays de l'O.C.A.M. (2) se sont attaqués à cette tâche, celle-ci a été poursuivie par certains d'entre eux regroupés au sein de l'U.D.E.A.C. (3). La normalisation des comptabilités des unités de production, conçue dès ses débuts en fonction des possibilités d'articulation des comptes avec ceux de la nation a été développée et étendue.

L'O.C.A.M. a ainsi dressé le Plan comptable général des entreprises non financières (PCG OCAM) en 1970, en a fourni une deuxième édition en 1980. L'UDEAC s'efforce d'étendre ce plan aux autres unités en tenant compte de leurs spécificités. Pour ce faire, elle a élaboré un Plan comptable général de l'Etat intéressant les unités administratives et adopté en 1974 ; elle a établi un Plan comptable sectoriel des banques et établissements financiers (PCS) essayant de concilier les impératifs de la Banque des Etats d'Afrique Centrale (BEAC) liés à ceux de la Banque de France, avec ceux du PCG OCAM et de la comptabilité nationale ; enfin elle a abouti à la mise en application d'un plan comptable pour les entreprises agricoles, à la rédaction d'un projet concernant les postes et télécommunications et d'un autre destiné aux compagnies d'assurance.

Quant au SCN, il distingue des comptes de production, des comptes de Revenu et dépenses et de Capital et financement, des comptes de biens et services et, enfin des comptes de consommation finale.

Pour ces deux dernières catégories de comptes, une articulation avec les comptes des unités n'est guère envisageable.

Les comptes de consommation finale traduisent soit une définition de la notion même de consommation finale retenue par le SCN (Institutions privées sans but lucratif au service des ménages, Administrations publiques), soit le passage du concept d'intérieur à celui de national (compte de consommation finale des Ménages). Pour eux il ne saurait être question d'une intégration à partir des comptes des entreprises.

(1) De tels comptes établis à partir des comptes d'agents du système en éliminant les prestations réciproques sont effectivement des comptes consolidés au sens comptable du terme.

(2) OCAM : Organisation Commune Africaine et Mauricienne

(3) UDEAC : Union Douanière des Etats d'Afrique Centrale

En ce qui concerne les comptes de biens et services ils résultent d'un regroupement par nature des biens. A leur débit sont inscrites les différentes origines : agents producteurs résidents et reste du monde (importations), à leur crédit les utilisations : consommations intermédiaires et finales, formation brute de capital fixe, variation de stocks et exportations. Ces sortes de tableaux de reclassement des productions par nature, pour l'instant du moins, pourraient difficilement être établis à partir des comptes des entreprises, hormis ceux de la comptabilité analytique.

C'est donc au niveau des comptes de production dressés dans le cadre des branches, puis des comptes de Revenu et dépenses et de Capital et financement établis par secteur institutionnel que l'on examinera le processus d'intégration des deux types de comptabilité.

# I - L'INTEGRATION DES COMPTABILITES POUR L'ETABLISSEMENT DES COMPTES DE PRODUCTION DES BRANCHES

Le SCN distingue les branches marchandes, les branches non marchandes des administrations publiques, les branches non marchandes des institutions privées sans but lucratif au service des ménages et les ménages.

Pour ces derniers, la production est, par définition limitée à celle des services domestiques et son montant est conventionnellement réputé égal à celui des salaires versés. Il ne saurait être question d'une quelconque intégration des comptabilités : les ménages n'en tiennent habituellement pas et, en toute hypothèse ne sont pas obligés d'en produire. Le montant des salaires versés par eux peut être approché par celui qu'ils déclarent aux organismes de sécurité sociale et/ou aux administrations fiscales.

Par contre, le PCG OCAM, le PCS des banques et établissements financiers peuvent faciliter l'établissement des comptes de la production de certaines branches marchandes, le PCG-Etat peut jouer le même rôle en ce qui concerne les branches non marchandes des administrations publiques et de certaines institutions privées sans but lucratif au service des ménages.

Le PCG OCAM étant le document de base à partir duquel les autres plans comptables ont été élaborés, c'est à partir de lui que l'on déterminera les règles de passage aux comptes de la nation, puis on précisera les variantes existant dans les autres plans.

## 1. L'élaboration du compte de production des branches marchandes ne comprenant ni unités financières ou administratives à titre principal

Le document de base est le tableau des soldes caractéristiques de gestion, auquel on adjoint parfois le tableau de passage aux soldes de comptes patrimoniaux.

Si l'on fait abstraction des différences formelles qui interdisent au comptable de l'OCAM, continuateur de la tradition française, de porter des sommes négatives dans les comptes, la comparaison entre les deux types de comptabilisation dégage plus de ressemblances de fond que de divergences.

### 1.1. Points communs entre les deux types de comptabilité au niveau des comptes de production

Pour le comptable national au compte de production des branches figurent d'une part, au débit, les composantes de la valeur ajoutée et les consommations intermédiaires, d'autre part, au crédit, les productions principales et autres.

#### a) En ce qui concerne les opérations portées au débit

Pour le SCN la valeur ajoutée ou Produit Intérieur Brut (PIB) se compose de : la rémunération des salariés, des impôts indirects nets de subventions d'exploitation et des consommations de capital fixe. Le débit du compte de production d'une branche fait apparaître la production en ajoutant à ces éléments les consommations intermédiaires.

- Les consommations intermédiaires figurent de manière distincte dans le tableau des soldes caractéristiques de gestion. Les deux comptabilités en retiennent des définitions semblables :

Pour le PCG-OCAM (1) :

"les consommations intermédiaires sont les charges encourues du fait de l'absorption par le processus de production de biens et services acquis à l'extérieur de l'unité comptable"

Pour le SCN (2) :

"la consommation intermédiaire des branches marchandes comprend les biens durables et les services utilisés pour produire. En principe, les biens non durables sont ceux dont la durée de vie escomptée ne dépasse pas une année"

Toutefois, la similitude des définitions et l'identité des termes n'implique pas celle des concepts. Une même opération sera rangée par le comptable national parmi les consommations intermédiaires ou les transferts selon la définition qu'il retient de la production et, par le comptable privé dans les consommations intermédiaires ou dans les charges.

. Si l'on peut admettre que la rubrique Frais de personnel correspond à la Rémunération des salariés du SCN, on devrait en toute logique y inclure les jetons de présence versés aux administrateurs qui, en comptabilité privée sont portés dans les Charges et pertes diverses. Toutefois, leur montant étant étroitement lié aux réglementations nationales, il semble plus opportun de les enregistrer dans les Autres transferts, c'est-à-dire dans le compte de Revenu et dépenses du secteur institutionnel correspondant.

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(1) OCAM, Plan comptable général des entreprises, 2ème édition, juillet 1980, Banqui, p. 149. Cité ultérieurement PCG-OCAM.

(2) ONU, Système de comptabilité nationale, ST/STAT/SER F/2 Rev 3, n° de vente F 69 XVII 3, New York, 1970, p. 106

. Au niveau des Impôts et taxes, la correspondance n'est pas parfaite avec les Impôts indirects du SCN : le compte du PCG-OCAM regroupe tous les impôts nationalement exigibles hormis celui assis sur le résultat. Y sont donc enregistrés :

"les impôts indirects et directs, les impôts et taxes perçus dans le cadre d'organismes africains, perçus par les organismes internationaux exigibles à l'étranger, la taxe professionnelle versée aux administrations, les droits de douane, les pénalités et amendes fiscales" (1).

Pour obtenir les Impôts indirects nets de subventions d'exploitations du SCN il convient donc :

1) de retirer d'Impôts et taxes les impôts directs, les amendes diverses et pénalités ;

2) d'en déduire les subventions d'exploitation inscrites au crédit du tableau des soldes caractéristiques de gestion.

. Quant à la consommation de capital fixe, bien qu'elle ne se confonde pas avec l'amortissement comptable, elle s'applique aux mêmes biens. Etant donné les incidences de la politique fiscale sur le montant des dotations de l'exercice, la rubrique du SCN devra être établie à partir des dotations de l'exercice à l'amortissement et à certaines provisions (2), parfois même le comptable national devra tenter une réévaluation des dotations tenant compte tant de la dépréciation de la monnaie que de la modification du prix des valeurs d'actif (3)

b) En ce qui concerne les opérations portées au crédit

Le SCN distingue simplement la production principale, caractéristique de la branche, des autres productions.

Les notions de production sont, sinon identiques, du moins voisines.

En ce qui concerne la production matérielle, le PCG OCAM retient la Production vendue modifiée de la Production stockée, donc le montant du chiffre d'affaires majoré ou minoré des variations de stocks de produits destinés à être vendus, concept identique à celui du SCN.

En ce qui concerne les activités commerciales, au sens d'achat pour la revente en l'état ; la production est, dans le PCG OCAM tout comme dans le SCN égale à la différence entre le chiffre d'affaires - solde du compte Ventes de marchandises - et le prix de revient des marchandises vendues. Cette différence appelée marge brute par le PCG OCAM est intégrée par lui dans la production de l'unité conformément au SCN.

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(1) PCG-OCAM, op. cit. p. 158

(2) Il s'agit de provisions que certaines entreprises tendent à constituer pour compléter le montant de la dotation à l'amortissement acceptée par le fisc

(3) cf. communication de M. Mouyelo Katoula, Passage du PCG des entreprises aux comptes de sociétés et quasi sociétés non financières, Comment lever certaines difficultés ?

Toutefois, les données portées dans le tableau des soldes caractéristiques de gestion, parce qu'extraites de la comptabilité générale, portent sur l'ensemble de l'activité de l'entreprise. Elles ne permettent pas de distinguer, comme le veut le SCN, la production principale des autres productions.

Deux solutions s'offrent pour apporter cette précision, soit recourir aux données de la comptabilité analytique, soit utiliser la "nomenclature de la production vendue compatible avec celle en usage dans l'Etat" (1) et prévue par le PCG OCAM.

La Production du PCG OCAM englobe en outre la Production de l'entreprise pour elle-même et les Frais à immobiliser et à transférer. La première enregistre :

"les immobilisations produites et les services produits par l'entreprise pour elle-même ainsi que les prélèvements de biens sur stocks produits par l'entreprise pour ses besoins propres ou ceux de son personnel" (2).

Il s'agit donc également d'une production pour le comptable national destinée soit à une formation brute de capital fixe soit à des consommations intermédiaires.

Quant au problème plus délicat des Frais à transférer, il sera examiné ultérieurement.

. Les règles d'évaluation et d'enregistrement de la production sont semblables. Le SCN retient une évaluation de la production au prix départ usine, c'est-à-dire toutes taxes comprises ; tandis que le PCG-OCAM enregistre la production vendue "au prix de vente hors taxes supportées par le client", donc en y incluant les seules taxes non récupérables. Ceci conduit aux différences entre les deux types de systèmes de comptabilisation.

## 2. Points de différence entre les deux types de comptabilité

A des différences de forme s'en ajoutent d'autres traduisant de manière plus ou moins accentuée celles existant entre les optiques ayant présidé à l'élaboration des deux types de comptabilité.

. Des différences tiennent au fait que les rubriques sont regroupées différemment dans les deux comptabilités. La présentation vise à faire apparaître le résultat dans l'entreprise pour le PCG-OCAM, à dégager les composantes de la valeur ajoutée, à analyser leur répartition et leur affectation dans le SCN.

. Des différences tiennent aux règles d'évaluation des stocks. Les règles du PCG OCAM visent à éviter que les entreprises répercutent immédiatement les variations de prix et que, de ce fait, elles accélèrent le processus de hausse des prix en l'amplifiant. A cette fin, ce plan recommande

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(1) PCG-OCAM, op. cit. p. 69

(2) Ibid. p. 171

la tenue des stocks selon la technique de l'inventaire permanent, c'est-à-dire à un prix de revient calculé après chaque mouvement. Lorsque l'entreprise n'a pas la possibilité d'appliquer une telle méthode, c'est le prix de revient pondéré de la période qui est retenu.

Le comptable national veut, quant à lui, saisir les variations en termes physiques, c'est pourquoi il précise que les entrées sont évaluées au prix d'acquisition, les sorties au prix départ-usine (1).

Sans doute en période de variations importantes des prix les écarts entre les deux types d'évaluation pourront-ils être substantiels. Toutefois, il convient de ne pas exagérer la portée de ce risque "méthodologique" devant les difficultés de collation des données (2).

. En ce qui concerne l'amortissement, appelé par le SCN consommation de capital fixe, les conceptions diffèrent partiellement.

Le SCN opte résolument pour la conception "amortissement-renouvellement" sur la base des charges prévisibles de renouvellement :

"La consommation de capital fixe peut être définie d'une manière générale comme la partie de la production nécessaire pour remplacer le capital fixe utilisé dans le processus de production pendant la période comptable" (3).

Toutefois,

"L'obsolescence imprévisible est traitée comme une perte en capital au moment où elle se produit effectivement et non pas comme une consommation de capital fixe. Il n'est pas tenu compte de l'épuisement des ressources naturelles dans la consommation de capital fixe" (4).

De ce fait, le SCN rejette la conception "historique" de l'amortissement. Il rompt avec cette pratique qui consiste à vouloir maintenir la valeur d'acquisition par un système de dotations sur la durée d'utilisation des immobilisations :

(1) "Ces principes d'évaluation des entrées en stock et des sorties sont cohérents avec ceux de l'évaluation de la production et de la consommation intermédiaire. La production de biens et services marchands sera évaluée de façon uniforme, quel que soit l'usage auquel elle est affectée. Ainsi on est également certain que chaque fois qu'une partie du stock est soit vendue, soit prélevée et utilisée dans la production, la valeur portée au débit du compte d'inventaire sera suffisante pour assurer le remplacement de la partie prélevée aux cours actuels du marché" (ONU, SCN, op.cit.p.116)

(2) Les auteurs de la méthodologie sont tout à fait conscients d'un tel risque : Les estimations de la valeur de la variation physique des stocks au cours d'une période donnée différeront sans doute de la différence entre les valeurs d'inventaire indiquées dans les comptes d'entreprise. Il sera donc souhaitable de présenter les deux jeux de données " (ONU, SCN op.cit.p.117)

(3) ONU, SCN, op. cit. p. 127

(4) Ibid. p.127 (7.19)



"En général, les producteurs fondent leurs méthodes d'évaluation des provisions annuelles pour usure et pour obsolescence prévisible sur l'idée du maintien de la valeur minimale de leur capital, grâce à l'étalement du coût initial du matériel considéré sur toute la durée de vie escomptée. Cette méthode est critiquable car, au fur et à mesure que le prix et les techniques évoluent, le coût du capital fixe peut être plus ou moins élevé que le résultat de ce calcul. Les estimations de la consommation de capital fixe devraient donc tenir compte de la valeur de remplacement des actifs pendant l'année pour laquelle l'estimation est faite" (1).

Une telle critique n'est pas valable pour le PCG-OCAM : l'amortissement-renouvellement est bien la technique qu'il préconise. Ce n'est qu'en raison des difficultés pratiques que pose l'évaluation des dotations que, dans sa seconde édition, il est revenu quelque peu en arrière et a opté pour une conception hybride :

"Les amortissements permettent la constatation comptable de la perte subie sur la valeur d'actif des immobilisations qui se déprécient avec le temps et sont destinées à reconstituer les capitaux investis (2).

Placé face aux contraintes de la pratique et en dépit de positions qui semblent si tranchées, le SCN se rapproche considérablement du PCG-OCAM. Constatant que le calcul de la consommation de capital fixe est chose difficile et que,

"les seules données disponibles sont les dotations inscrites dans les comptabilités des producteurs. Les renseignements sur les valeurs d'acquisition de biens comparables, nécessaires pour passer de ces dotations aux coûts de remplacement sont souvent inadaptées aux besoins. Pourtant comme le niveau des prix des biens d'équipement est sujet à variation, il importe de pouvoir corriger les dotations effectuées" (3).

C'est donc aux données de la comptabilité privée, et celle à laquelle fait allusion le SCN ne retient même pas l'amortissement-renouvellement que renvoie le comptable national devant la carence des données et les difficultés concrètes de l'élaboration des comptes :

"Les ajustements exigés par la comptabilité nationale peuvent être considérables et sont sujets à une forte marge d'erreur ; il sera donc utile de disposer de renseignements sur les dotations aux amortissements des comptabilités d'entreprises et sur les revenus nets calculés à partir de ces dotations" (4).

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(1) Ibid. p. 127 (7.22)

(2) PCG-OCAM, op. cit. p. 87

(3) ONU, SCN, op. cit. p. 127 (7.23)

(4) ONU, SCN, op. cit. p. 128 (7.24)

En dépit des positions initiales les données des deux comptabilités restent donc liées en ce domaine.

. Des différences tiennent aux différences d'optique entre la comptabilité d'entreprise et la comptabilité nationale.

- L'entreprise n'enregistre parmi ses charges que celles qu'elle supporte effectivement et qu'elle ne peut répercuter sur des tiers. C'est pourquoi, les immobilisations, les ventes sont comptabilisées hors taxes récupérables, c'est pourquoi les taxes sur stocks sont inscrites à Impôts et taxes.

- L'entreprise ne retient pas la distinction du SCN entre impôts indirects-composante de la valeur ajoutée- et impôt direct - transfert de revenu. Pour elle seul compte le mode de calcul de ce qu'elle doit supporter. Ainsi tout impôt dont l'assiette n'est pas le résultat sera-t-il rangé dans Impôts et taxes. Dans ce même compte, le comptable du PCG-OCAM inscrit les amendes et pénalités qui pour le comptable national sont des transferts et, à ce titre, portées dans le compte Revenu et dépenses du secteur institutionnel correspondant. Le transfert qui, pour le comptable national est une affectation de revenu d'un agent au profit d'un autre agent, est une charge pour l'entreprise qui l'effectue. La différence entre les deux comptabilités est ici infrangible.

- La ventilation entre les consommations intermédiaires et les autres charges dépend du lien que l'on établit entre ces consommations et la production. L'entreprise se place du point de vue de l'obtention de sa propre production, tandis que le comptable national a en vue l'agrégat intérieur regroupant un ensemble de biens et services marchands et non marchands. Ainsi les primes d'assurances sont-elles intégralement considérées comme des charges par le comptable d'entreprise, tandis que pour le SCN elles sont pour partie la rémunération d'un service et donc des consommations intermédiaires. Le comptable national pourra être tenté de soumettre au même traitement les frais financiers qui ont pour contrepartie la production imputée des institutions financières.

- La production du PCG-OCAM inclut les Frais à immobiliser et à transférer, ce qui conduit à la gonfler par rapport à son homologue du SNC.

En effet, dans ce compte de Frais sont comptabilisés : d'une part, des "avantages en nature accordés au personnel enregistrés dans les consommations intermédiaires lorsque leur comptabilisation dans les frais de personnel est exigée par la réglementation en vigueur dans l'Etat" (1), d'autre part, des charges à répartir sur plusieurs exercices(2).

En ce qui concerne les premiers, leur place dans la production est justifiée lorsque les avantages portent sur des produits de l'entreprise, mais ne l'est pas dans les autres cas. Pour les seconds, il est clair qu'ils ne constituent pas une production au sens du SCN et qu'ils gonflent simplement la production de l'entreprise.

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(1) PCG-OCAM, op. cit. p. 172

(2) Ce sont des "frais relatifs au pacte social, à l'émission d'obligations et d'autres emprunts, d'acquisition et de mise en service des immobilisations, de premier établissement, des frais de nature exceptionnelle à étaler sur plusieurs périodes" (PCG-OCAM, op. cit. p.172)

En théorie du moins, on pourrait éliminer ces frais que le comptable de l'OCAM inscrit dans un compte de valeurs immobilisées. En pratique cela serait coûteux pour un faible gain en précision. C'est pourquoi, lorsque les avantages en nature portant sur des produits de l'entreprise ne sont pas très importants, il convient de déduire l'intégralité des Frais à immobiliser et à transférer de la production de l'entreprise.

Il en résulte que la production des comptes de branches marchandes des unités non financières pourra être valablement approchée par la sommation des productions tirées des tableaux des soldes caractéristiques de gestion des unités. Elle n'en diffère que sur trois points relativement mineurs :

- les services d'assurances qui sont des consommations intermédiaires pour le SCN, tandis que ce sont des Charges et pertes diverses pour le PCG-OCAM ;

- les Frais à transférer et à immobiliser qui n'entrent pas dans la production du SCN alors qu'ils sont inclus dans celle du PCG OCAM ;

- les taxes indirectes qui sont incluses dans le prix départ usine du comptable national, tandis que le prix des marchandises vendues du comptable d'entreprise ne retient que les taxes récupérables.

On peut ainsi conclure avec les rédacteurs d'une méthodologie destinée à faciliter l'introduction du SCN (1) :

"On constate néanmoins à quel point les deux notions sont proches. On peut dès lors utiliser le solde "Valeur ajoutée" du document comptable pour estimer le montant du PIB lors des travaux rapides de comptabilité nationale (par exemple, comptes provisoires esquissés dès l'arrivée du document comptable, dans les services statistiques avant tout traitement ou correction").

Les relations entre les deux comptabilités peuvent être illustrées par le diagramme n° 1.

## 2. Etablissement du compte de production des branches marchandes pour les unités financières

Outre les difficultés précédentes, le problème tient à la qualité de producteur qui est conférée à ces unités par le SCN.

Par application des principes de l'ancienne comptabilité nationale française, le plan comptable sectoriel des banques et établissements financiers (PCS) considérait que la production des banques ne portait que sur les commissions et autres services divers fournis par elles. De sorte que lorsque la qualité de producteur leur a été reconnue pour l'ensemble de leur activité, leur valeur ajoutée était dans la plupart des cas structurellement négative.

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(1) République française, Ministère de la coopération et du développement Guide d'élaboration des comptes économiques dans les pays en voie de développement, tome I, méthodologie, Paris, 1981, p. 175

Pour éviter une telle "anomalie", le SCN considère que la production des banques est égale à la valeur des services de caractère financier qu'elles fournissent à leur clientèle, services mesurés par la différence entre les revenus tirés du placement des fonds apportés par les déposants et les intérêts versés pour ces fonds. Etant donné que dans la pratique, il est impossible de distinguer entre les fonds propres et ceux provenant de la clientèle, cette valeur ajoutée est réputée égale à la différence entre les intérêts reçus et les intérêts versés.

Toutefois, les banques de développement ayant pour objectif principal la prise de participations, le PCS a assimilé les dividendes perçus par elles à des intérêts (1).

De sorte que le calcul de la marge d'activité bancaire s'établit comme suit :

#### Détermination de la marge d'activité bancaire

Intérêts supportés sur opérations d'exploitation	Intérêts produits sur opérations d'exploitation
Commissions et frais bancaires	Commissions et frais bancaires
* Intérêts sur ressources permanentes	* Intérêts sur ressources permanentes
<u>Solde</u> : marge d'activité bancaire	

\* uniquement dans les établissements financiers

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(1) "Par convention, les banques de développement y maintiendront (dans le compte Intérêts et dividendes sur immobilisations financières M.A) les dividendes et tantièmes obtenus sur leurs participations, bien qu'ils relèvent de leur activité de clientèle. Mais, elles les rapporteront à leur marge d'activité bancaire. Par contre, si elles considèrent que certains intérêts représentent un placement non lié à l'activité bancaire, elles les intégreront au résultat brut d'exploitation, conformément au Plan comptable général" (UDEAC, Plan comptable sectoriel des banques et établissements financiers, Bangui, 1980, p. 85)

diagramme n° 1 : Etablissement du compte de production des branches marchandes à partir du  
tableau des soldes caractéristiques de gestion du PCG-OCAM

Soldes caractéristiques de gestion débit	Compte de production branches marchandes		Soldes caractéristiques de gestion crédit
	débit	crédit	
<u>Consommations intermédiaires</u> - matières et fournitures consommées - transports consommés - autres services consommés Solde : valeur ajoutée	{ Consommations intermédiaires	Produits caractéristiques de la branche  Autres produits de la branche	<u>Production</u> - marge brute - production stockée - travaux faits par l'entreprise pour elle-même - frais à immobiliser et à transférer
Charges et pertes diverses Frais de personnel Impôts et taxes Intérêts Dotations de l'exercice aux amortissements Dotations de l'exercice aux comptes de provisions Solde : Résultat d'exploitation  Résultat hors exploitation Moins-values de cession Impôts sur le résultat Résultat à affecter	{ Rémunérations des salariés  { Impôts indirects nets de subventions d'exploitation { Consommation de capital fixe  Excédent d'exploitation	Produits et profits divers Subventions d'exploitation Intérêts et dividendes reçus Reprises sur amortissements et provisions  Solde : Résultat d'exploitation  Résultat hors exploitation Plus-values de cession  Résultat	Reprise de la valeur ajoutée

————— compte entièrement viré à la rubrique correspondante du compte de production de la branche  
 ----- contenu du compte partiellement viré à la rubrique correspondante du compte de production de la branche

La marge d'activité bancaire du PCS correspond donc, aux intérêts hors exploitation près, à la production principale dégagée par le SCN pour les institutions financières.

En ce qui concerne les autres rubriques, les remarques relatives au PCG OCAM pour les entreprises non financières se retrouvent et les passages des éléments du tableau des flux et soldes caractéristiques de gestion au compte de production s'effectuent dans les mêmes termes :

1) les fournitures, transports et autres services consommés constituent les consommations intermédiaires du SCN, lesquelles incluent également la partie des Charges et pertes diverses relative aux primes d'assurances ;

2) les Frais de personnel fournissent la Rémunération des salariés ;

3) les Impôts et taxes partiellement repris et après déduction des Subventions d'exploitation indiquent le montant de Impôts indirects nets de subventions d'exploitation

4) les dotations à l'amortissement modifiées d'une fraction des dotations aux provisions et des reprises sur amortissements permettent d'approcher la consommation de capital fixe ;

5) l'excédent d'exploitation se retrouve avec son caractère résiduel sans qu'une correspondance immédiate puisse s'établir avec le Résultat net d'exploitation.

Comme précédemment il est possible d'établir le diagramme (n° 2) schématisant le passage de la comptabilité des unités à celle de la nation.

#### C. Etablissement du compte de production des branches non marchandes des administrations publiques

Les deux comptabilités doivent affronter en premier lieu le problème de la définition de l'Administration publique, laquelle implique celle de l'agent branche non marchande correspondante du SCN et l'application du Plan comptable de l'Etat des membres de l'UDEAC.

Or, les définitions de l'Etat et des administrations varient selon les pays, rendant ainsi difficiles les harmonisations quant au champ même d'application du plan comptable :

"Il est évident que plusieurs difficultés surgiront s'il existe un secteur para étatique important ou en raison de la non concordance entre les administrations nationales et la définition théorique des administrations publiques.

En effet, certains organismes astreints aux règles de la comptabilité publique sont classés dans les Sociétés et quasi sociétés non financières publiques par la comptabilité nationale, alors que les organismes classés parmi les administrations publiques par la comptabilité nationale ont parfois un statut juridique différent" (1).

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(1) Plan comptable général de l'UDEAC de l'Etat, Ouvrage d'initiation, Secrétariat général de l'UDEAC, Bangui, 1978, p. 26

diagramme n° 2 : Etablissement du compte de production des branches marchandes des institutions financières à partir du tableau des Flux et soldes caractéristiques de gestion du PGS des banques et établissements financiers.

Flux et soldes caractéristiques de gestion	Compte de production		Flux et soldes caractéristiques de gestion
	débit	crédit	
<p>Fournitures consommées }            Transports consommés }            Autres services consommés }            Charges et pertes diverses }            Frais de personnel }            Impôts et taxes - - - - - }            Intérêts sur ressources permanentes *  <u>Solde</u> : Résultat brut d'exploitation</p>	<p>Consommations intermédiaires</p> <p>Rémunérations des salariés</p> <p>Impôts indirects nets de subventions d'exploitation</p>	<p>Produits caractéristiques de la branche</p> <p>Autres produits de la branche</p>	<p>Marge d'activité bancaire</p> <p>Services produits</p> <p>Production pour l'entreprise</p> <p>Frais à transférer</p> <p>Produits et profits divers</p> <p>Subventions d'exploitation et d'équilibre</p> <p>Intérêts et dividendes d'immobilisations financières (*)</p> <p>Résultat brut d'exploitation</p>
<p>Reprise du résultat brut d'exploitation</p> <p>Dotations aux amortissements }            Dotations aux provisions }            Moins-values de cession }  <u>Solde</u> : Résultat net avant impôt</p>	<p>Consommation de capital fixe</p> <p>Excédent net d'exploitation</p>		<p>Reprise du résultat brut d'exploitation</p> <p>Reprises sur amortissements et provisions</p> <p>Plus-values de cession</p> <p><u>Solde</u> : résultat net avant impôt</p>

\* pour les banques de dépôts seulement

—— compte entièrement viré à la rubrique correspondante du compte de production de la branche

----- contenu du compte partiellement viré dans la rubrique correspondante du compte de production de la  
branche.

Si les critères économiques sont dominants pour le SCN, ce sont davantage des règles juridiques, en particulier celles tenant aux liens entre les unités et le budget de l'Etat, qui délimitent le domaine de la comptabilité publique. Telle est la raison pour laquelle les membres de l'UDEAC retiennent pour l'instant comme critère d'application du PCG-Etat la soumission de l'unité aux règles de la comptabilité publique. Il en est résulté la nécessité de répertorier les unités administratives concernées, dont certaines seront les unités des branches non marchandes des administrations publiques du SCN.

L'articulation de la comptabilité des unités avec la comptabilité nationale est beaucoup plus délicate que celles examinées précédemment, en raison du caractère particulier de la comptabilité publique, des variantes pouvant exister entre les règles auxquelles sont astreintes les diverses unités en relevant. Les auteurs du PCG-Etat sont parfaitement conscients de la complexité des tâches qui se posent à eux et des problèmes qu'il leur faudra résoudre afin d'envisager la consolidation des documents émanant des unités :

"Il ne faudra cependant pas se cacher que cette opération de consolidation présente un certain nombre de difficultés techniques qu'il faudra au préalable résoudre pour la mener à bien. Un premier lot de difficultés résulte de l'imprécision même des concepts de la comptabilité nationale quand il s'agit d'identifier les opérations observées pour les enregistrer comptablement ; une autre source de difficultés surgit quelquefois liée à la précédente quand on impose de faire accorder les écritures relatives aux opérations entre unités administratives dans les livres de chaque unité. Les règles de valorisation sont également à l'origine de discordances. Quant à la saisie même des informations elle nécessite un soin tout particulier et l'établissement des règles strictes à respecter : la distinction entre une dépense d'investissement et une dépense de fonctionnement, l'utilisation de nomenclatures, sont des opérations comptables délicates pour l'unité administrative qui doit souvent tenir compte de contingences assez éloignées des préoccupations d'une grande hauteur de vue du comptable national. S'il est donc possible de concevoir un compte agrégé des unités administratives, ce compte ne sera jamais le compte des Administrations du comptable national (1).

Les rédacteurs du PCG-Etat ont tenté de permettre la consolidation des comptes des unités pour dresser ceux du secteur institutionnel Administrations publiques "en s'appuyant sur la logique des systèmes de comptabilité nationale, les plus généralement admis" (2). Cela signifie que seules certaines unités auxquelles s'applique le PCG-Etat relèveront de l'agent Branches non marchandes des administrations publiques, ce dernier étant, par définition, moins large que le secteur institutionnel correspondant. Cela traduit en outre le fait que les auteurs du PCG-Etat se sont implicitement référés non pas au SCN, mais au Système Elargi de Comptabilité Nationale (SECN).

Le passage à l'agent branches est possible : le SECN, comme le SCN, retient la distinction entre activités marchandes et non marchandes

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(1) UDEAC, Plan comptable général de l'Etat, 1ère édition, Bangui, 7 décembre 1974, p. 10

(2)



laquelle est donc utilisée pour le classement des unités dans le PCG-Etat.

"Le classement des opérations selon leur nature économique est lié à la nature de l'activité de chaque unité administrative : les unités soumises au plan comptable sont classées en deux catégories selon qu'elles sont considérées ou non comme productrices de biens et services marchands au sens de la comptabilité économique nationale. A des fins de consolidation les effets de partition s'imposent tant à l'unité administrative elle-même qu'aux unités administratives avec lesquelles elle est en rapport" (1).

Cette partition est ainsi :

"un impératif en ce qui concerne les unités administratives considérées en tant qu'entités juridiques, ce principe de classement doit être étendu aux différentes sections comptables constituées au sein d'une même unité" (2).

Conformément à ce principe et en retenant la terminologie de l'ancien système français de comptabilité nationale, le PCG-Etat considère comme :

1) agents producteurs : les unités administratives ayant une activité marchande et,

2) agents non producteurs : celles n'ayant pas d'activité marchande (3).

Entrent ainsi dans les branches non marchandes des administrations publiques, les unités classées par le PCG-Etat parmi les unités non productrices, terminologie en contradiction avec la définition de la production retenue par la comptabilité nationale des Etats de l'UDEAC.

Le PCG-Etat est calqué sur celui des entreprises avec cependant quelques variantes dont, les unes sont liées à la spécificité des unités administratives, telles les subventions et transferts versés, les produits fiscaux, tandis que d'autres sont de simples variantes d'intitulés, des "inversions" de numéros de comptes que rien ne permet de justifier et qui pourront être gênantes dans la perspective d'une informatisation. Par exemple, le compte 64 Charges et pertes diverses devient le compte 67 du PCG-Etat : Autres charges et pertes diverses, alors que le compte 64 de ce dernier plan intitulé Frais financiers n'est rien d'autre que le compte 67 Intérêts du PCG OCAM, etc.

Mais, par delà ces différences de forme, le passage aux comptes de production des branches se heurte aux spécificités de l'unité administrative :

#### 1. En ce qui concerne les opérations portées au débit

Compte-tenu des remarques précédentes en additionnant les Consommations de biens et services liées au fonctionnement de l'unité administrative on obtient les Consommations intermédiaires du compte de production des bran-

(1) UDEAC, PCG-Etat, op. cit. p. 193

(2) Ibid.

(3) Ibid. pp. 193-194 et d'une façon moins claire pp 291-292

ches correspondantes. La somme des Frais de personnel des unités fournit la Rémunération des salariés. Les dotations aux amortissements, une partie de celles aux provisions et les reprises sur amortissements permettent une estimation de la Consommation de capital fixe. Quant aux Impôts indirects nets de subventions d'exploitation, un dépouillement d'Impôts et taxes et le recours au poste Subventions d'exploitation permettent d'en approcher le montant.

Seules ces quatre rubriques devraient figurer dans le tableau des soldes caractéristiques de gestion puisque, par définition, les unités concernées sont non marchandes. Cependant, le PCG-Etat fait apparaître un Résultat brut de fonctionnement, puis après déduction des dotations à l'amortissement et aux provisions, un résultat net.

Ce dernier résultat est déterminé après inscription de transferts au profit d'autres unités ou provenant d'autres unités, il s'apparente donc davantage à l'Epargne nette du SCN qu'à l'Excédent d'exploitation.

## 2. En ce qui concerne les opérations portées au crédit

Trois rubriques figurent dans le compte de production des Branches non marchandes :

- . Productions de biens et services pour compte propre,
- . Ventes de biens et services non marchands,
- . Productions de biens et services marchands.

La correspondance entre les comptes des unités et ceux du SCN est ici imparfaite.

- Il est possible de considérer que les Ventes accessoires de biens et services portent sur les Productions de biens et services marchands des branches non marchandes. En effet, le PCG-Etat stipule que ce compte est ouvert dans les "unités administratives classées parmi les agents non producteurs de biens et services marchands" et que n'y sont inscrits que "les biens et services marchands tels que définis par les règles et nomenclature de la comptabilité nationale, à l'exclusion de l'auto-équipement" (1).

- Par contre, il ne semble pas exister de correspondance entre des comptes du PCG-Etat et les Ventes de biens et services non marchands, non plus qu'avec la Production pour compte propre ; laquelle, dans la définition qu'en donne le SCN, n'est qu'une catégorie résiduelle.

En ce qui concerne les Frais à immobiliser et les Frais à transférer les remarques concernant le PCG-OCAM se retrouvent.

Les relations entre les deux types de comptabilité peuvent ainsi être schématisées par le diagramme n° 3.

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(1) UDEAC, PCG-Etat, op. cit. p. 200

diagramme n° 3 : Etablissement du compte de production des branches non marchandes des administrations publiques à partir du tableau des soldes caractéristiques de gestion du PCG-Etat

Soldes caractéristiques de gestion	Compte de production		Soldes caractéristiques de gestion
débit	débit	crédit	crédit
Consommation de biens et services liés au fonctionnement de l'unité administrative Frais de personnel Impôts et taxes Subventions versées Transferts versés Autres charges et pertes diverses  <u>Solde créditeur</u> : Résultat brut de fonctionnement	{ consommations intermédiaires { Rémunération des salariés { Impôts indirects nets de subventions d'exploitation	Ventes de biens et services non marchands Production de biens et services marchands Production pour compte propre	{ Ventes accessoires de biens et services marchands { Avantages en nature { Frais à transférer { Frais à immobiliser { Produits fiscaux { Subventions d'exploitation et fonctionnement reçues { Transferts reçus { Autres produits et profits divers <u>Solde débiteur</u> : Résultat brut de fonctionnement
Reprise du solde débiteur Dotations aux amortissements Dotations aux provisions Moins-value de cession  <u>Solde</u> : résultat patrimonial	{ Consommation de capital fixe		Reprise du solde créditeur Reprise sur amortissements Reprises sur provisions et fonds de réserves Plus-values de cession <u>Solde</u> : Résultat patrimonial

———— compte entièrement viré à la rubrique correspondante du compte de production des branches

----- contenu du compte partiellement viré à la rubrique correspondante du compte de production des branches

De telle sorte que, tant pour les entreprises non financières que pour les banques et institutions financières, les plans comptables établis respectivement par l'OCAS et l'UDEAC doivent permettre sans grande difficulté une intégration des comptes pour l'établissement du compte de production du SCN. En ce qui concerne les unités administratives, la question liminaire reste celle de la définition de ces unités et les obstacles comptables ne sont que la traduction du caractère artificiel de la qualité de producteur qui leur a été attribuée par le SCN.

Il n'en demeure pas moins que pour ces trois types d'unités les efforts de l'OCAM prolongés par ceux de l'UDEAC constituent une étape importante pour l'établissement des comptes de production des branches.

## II - L'INTEGRATION DES COMPTABILITES AU NIVEAU DES COMPTES DE REVENU ET DE DEPENSES ET DE CAPITAL ET DE FINANCEMENT

Pour le SCN, les agents changent lorsqu'on passe des comptes de production à cette seconde catégorie de comptes. Tandis que pour les premiers les agents sont des branches, pour les seconds le SCN se réfère aux secteurs institutionnels. Ce qui signifie que les comptes des unités dont les comptabilités sont tenues selon les règles du PCG-OCAM fourniront ceux des Sociétés et quasi-sociétés non financières ainsi que ceux des entreprises individuelles incluses dans le secteur institutionnel Ménages ; que les comptes de l'ensemble des unités administratives, qu'elles soient considérées comme agent producteur ou non producteur, permettront une approche de comptes du secteur institutionnel Administrations publiques et, que les comptes tenus selon le plan sectoriel des banques et établissements financiers fourniront les éléments de ceux du secteur institutionnel Institutions financières pour la partie banques et institutions financières, c'est-à-dire sans les compagnies d'assurances pour lesquelles un plan particulier est à l'étude.

Pour chacun des secteurs institutionnels le SCN distingue trois comptes : Revenu et dépenses, Capital et financement et compte financier. Ces comptes retraçant des affectations du solde des comptes de production les remarques précédentes se retrouvent ici à titre complémentaire.

### A. Le compte de Revenu et dépenses

Quel que soit le plan comptable auquel sont soumises les unités, le principe est toujours le même : dans aucun des cas, le Résultat qualifié de fonctionnement ou d'exploitation, ne se confond avec l'Excédent net d'exploitation du SCN qui est repris au crédit du compte de Revenu et dépenses. Ces deux "résultats" diffèrent essentiellement en raison de l'inscription, par le comptable des unités, au rang de charges et produits, d'opérations que le comptable national considère comme des transferts et, qu'à ce titre, il place dans le compte Revenu et dépenses.

Pour effectuer le passage du tableau des soldes caractéristiques de gestion au compte Revenu et dépenses il convient donc de ventiler à nouveau les rubriques de ce tableau en décontractant parfois certaines d'entre elles.

1. Le compte Revenu et dépenses des Sociétés et quasi-sociétés  
non financières

Le compte de cet agent secteur institutionnel se présente de la façon suivante :

Revenu et dépenses des Sociétés et quasi-sociétés

Revenus prélevés par les entrepreneurs individuels des quasi-sociétés non financières Revenus de la propriété Primes nettes d'assurances-dommages Impôts directs Amendes et pénalités Prestations sociales directes Transferts courants nets <u>Solde</u> : Epargne nette	Revenus prélevés par les entrepreneurs individuels des quasi-sociétés non financières Revenus de la propriété Indemnités d'assurances-dommages Cotisations sociales imputées Excédent net d'exploitation
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Si l'on part du tableau des soldes caractéristiques de gestion, il existe :

En premier lieu, des rubriques qui peuvent être directement cumulées pour donner celles du SCN :

- les Intérêts et dividendes créditeurs fournissent les Revenus de la propriété inscrits au début de Revenu et dépenses ;

- les Intérêts débiteurs regroupent ceux payés sur "emprunts obligataires, autres emprunts, comptes courants bancaires et escomptes accordés" (1). Portés au débit de Revenu de la propriété, ils viennent s'ajouter aux dividendes versés par les sociétés qui figurent dans le Résultat à affecter, c'est-à-dire après inclusion du report à nouveau et des réserves intégrées au bénéfice à distribuer.

En deuxième lieu, la rubrique Charges et pertes diverses et son homologue au crédit Produits et profits divers, doivent être ventilées entre les divers postes du compte Revenu et dépenses.

Les charges et pertes diverses comprennent (2) :

- les fermages et revenus de la terre ;

(1) PCG-OCAM, op. cit. p. 159

(2) Ibid. p. 156

- les redevances sur brevets et licence,
- les primes d'assurance IARD,
- les subventions accordées et les cotisations syndicales,
- les rémunérations des dirigeants non salariés (jetons de présence),
- les malis sur emballages rendus,
- les créances irrécouvrables,
- les différences de change,
- les amendes pénales,
- les ristournes accordées non affectées à un compte de vente.

Il convient donc de vider ce compte entre les rubriques de Revenu et dépenses :

- en inscrivant les amendes pénales dans Amendes et pénalités ;
- en portant les fermages et revenus de la terre ainsi que les redevances sur brevets et licences dans les Revenus de la propriété où ils viennent s'ajouter aux Intérêts et dividendes,
- en enregistrant parmi les transferts les cotisations syndicales et les rémunérations des dirigeants non salariés,
- quant aux créances irrécouvrables, aux différences de change elles seront utilisées pour l'annexe financière de Capital et financement.

Symétriquement, les Produits et profits divers comprennent (1)

- les rabais et ristournes obtenus hors factures des fournisseurs,
- les bonifications obtenues des clients,
- les primes et débits sur ventes,
- les redevances pour brevets et licences,
- les fermages et metayages,
- les cotisations et dons reçus,
- les bonis sur reprises d'emballages consignés,
- les subventions d'équipement reprises pour quote part,
- les créances sur créances amorties,
- les différences de change, les lots,
- les indemnités d'assurances perçues sur manquants sur stocks.

La ventilation entre les rubriques du crédit du compte Revenu et dépenses ou en déduction de celles du débit s'effectue comme précédemment.

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(1) PCG-OCAM, op. cit. p. 173

En troisième lieu, le problème des primes d'assurances-dommages posé lors de l'établissement du compte de production se retrouve ici. Ces primes couvrent deux types de flux : d'une part, la rémunération du service fourni par l'entreprise d'assurances, d'autre part, la couverture du risque. Le premier élément entre seul dans la production de la branche assurance et constitue donc une consommation intermédiaire de la branche utilisatrice ; quant à la seconde partie, n'étant pas la contrepartie d'une production, le comptable national la considère comme une affectation de revenu -un transfert courant- et, à ce titre l'inscrit dans le compte Revenu et dépenses dans la rubrique Primes nettes d'assurances-dommages.

Etant donné que la production des compagnies d'assurances-dommages est conventionnellement réputée égale à la différence entre les indemnités qu'elles versent et les primes qu'elles perçoivent, le rapport entre cette production et le montant total des primes constitue un coefficient qui peut valablement être appliqué au sous-compte de Charges et pertes diverses : Primes d'assurances, pour détermination de la rubrique correspondante de Revenu et dépenses.

Enfin, les Impôts directs de Revenu et dépenses enregistrent d'une part, une fraction d'Impôts et taxes, d'autre part, l'impôt sur le résultat.

Quant à l'épargne nette, elle apparaît comme le solde du compte, tout comme l'était l'excédent d'exploitation dans le compte de production.

Il est ainsi possible d'établir la correspondance suivante entre les comptes du PCG-OCAM et le compte Revenu et dépenses des Sociétés et quasi-sociétés non financières du SCN (diagramme n° 4).

## 2. Le compte de Revenu et dépenses des Institutions financières

Le secteur institutionnel comprend d'une part, les banques et les institutions financières, d'autre part, les compagnies d'assurances. Les premières étant seules régies par le PCS, c'est donc le compte du secteur institutionnel, compagnies d'assurances exclues, qui sera examiné ici.

Dans de telles conditions, les particularités du compte Revenu et dépenses du secteur disparaissent (1) et celui-ci se présente comme celui des sociétés et quasi-sociétés non financières.

Quant aux rubriques du tableau des Flux et soldes caractéristiques de gestion, elles ne diffèrent de celles du PCG-OCAM que par quelques variantes terminologiques. Les véritables particularités du compte des banques et institutions financières, étant liées à la définition de la production, n'apparaissent plus ici, sinon par le montant de l'Excédent d'exploitation.

De sorte que, de façon tout à fait semblable à celle autorisée par le PCG-OCAM, le PCS permet de dresser la partie du compte Revenu et dépenses des Institutions financières, compagnies d'assurances exclues. (diagramme n° 5).

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(1) La présence des compagnies d'assurances dans le compte Revenu et dépenses implique la présence des primes d'assurances au crédit et des indemnités au débit.

diagramme n° 4 : Etablissement du compte Revenu et dépenses des Sociétés et quasi-sociétés à partir du tableau des soldes caractéristiques de gestion du PCG-OCAM

Soldes caractéristiques de gestion débit	Revenu et dépenses		Soldes caractéristiques de gestion crédit
	débit	crédit	
<u>Consommations intermédiaires</u> <u>Intérêts</u> <u>Charges et pertes diverses</u> <ul style="list-style-type: none"> <li>- fermages et revenus de la terre</li> <li>- redevances sur brevets et licences</li> <li>- primes d'assurances</li> <li>- subventions accordées et cotisations syndicales</li> <li>- rémunération des dirigeants non salariés</li> <li>- mali sur emballages rendus</li> <li>- créances irrécouvrables</li> <li>- différence de change</li> <li>- amendes pénales</li> <li>- ristournes accordées</li> </ul>	Revenus prélevés par les entrepreneurs des quasi-sociétés  Revenus de la propriété  Primes d'assurances dommages  Transferts courants  Prestations sociales directes des employeurs Amendes et pénalités  Impôts directs Epargne nette	Revenus prélevés par les entrepreneurs des quasi-sociétés  Revenus de la propriété  Indemnités d'assurances dommages  Cotisations sociales  Excédent net d'exploitation	Production  Produits et profits divers <ul style="list-style-type: none"> <li>- rabais, remises, ristournes</li> <li>- primes et débits sur ventes</li> <li>- redevances sur brevets et licences</li> <li>- fermages et métayages</li> <li>- cotisations et dons reçus</li> <li>- boni sur reprises d'emballages</li> <li>- subventions d'équipement</li> <li>- indemnités d'assurance perçues</li> <li>- rentrées sur créances amorties</li> <li>- différences de change</li> <li>- lots</li> <li>- manquants de stocks</li> </ul> Subventions d'exploitation et hors exploitation Intérêts et dividendes reçues Reprises sur amortissements et provisions Résultat

—— compte entièrement viré à la rubrique correspondante de Revenu et dépenses

----- contenu du compte partiellement viré à la rubrique correspondante du compte Revenu et dépenses



diagramme n° 5 : Etablissement du compte de Revenu et de dépenses des Institutions financières (compagnies d'assurances exclues) à partir du tableau des Flux et soldes caractéristiques de gestion du PCS

Flux et soldes caractéristiques	Revenu et dépenses		Flux et soldes caractéristiques
	débit	crédit	
fournitures consommées transports consommés autres services consommés  charges et pertes diverses <ul style="list-style-type: none"> <li>- primes d'assurances -</li> <li>- rémunération des actifs incorporels et de la terre</li> <li>- jetons de présence</li> <li>- subventions accordées</li> <li>- dons et pourboires</li> <li>- cotisations professionnelles</li> <li>- pertes de change</li> <li>- créances irrécouvrables</li> <li>- déficits de caisse et manquants sur stocks</li> <li>- amendes pénales</li> </ul> Frais de personnel Impôts et taxes Intérêts sur ressources permanentes* Dotations aux amortissements et aux provisions Résultats sur cession Impôt sur le résultat Résultat net à affecter	Revenu prélevé par les entrepreneurs des quasi-sociétés  Primes d'assurance dommages  Revenus de la propriété  Indemnités d'assurance**  Transferts courants  Amendes et pénalités  Impôts directs Prestations sociales directes des employeurs	Revenu prélevé par les entrepreneurs des quasi-sociétés  Indemnités d'assurance }  Revenus de la propriété }  Primes d'assurances**  Cotisations sociales  Excédent net d'exploitation	Marge d'activité bancaire Services produits Production pour l'entreprise Frais à transférer Produits et profits divers <ul style="list-style-type: none"> <li>- indemnités d'assurances</li> <li>- revenus d'actifs incorporels et de la terre</li> <li>- jetons de présence</li> <li>- subventions d'équipement</li> <li>- lots</li> <li>- profits de change</li> <li>- rentrées sur créances abandonnées</li> <li>- excédents de caisse</li> <li>- divers</li> </ul> Subventions d'exploitation Intérêts et dividendes   Résultats sur cession  Résultat net

\* dans les banques de dépôts

\*\* n'existe que dans les compagnies d'assurances

—— compte entièrement viré à la rubrique correspondante de Revenu et dépenses

----- contenu du compte partiellement viré à la rubrique correspondante de Revenu et dépenses

### 3. Le compte Revenu et dépenses des Administrations publiques

Ainsi qu'il a été noté précédemment, la correspondance entre l'application de la comptabilité publique, donc du PCG-Etat, et la notion d'administration publique retenue par le SCN n'est pas parfaite. Certaines unités astreintes aux règles de la comptabilité publique sont rangées par le SCN dans les Sociétés et quasi-sociétés ou dans les Institutions financières ou encore dans les Institutions privées sans but lucratif au service des ménages. Bien que la commission d'application du PCG-Etat s'efforce de dresser une liste des unités administratives qui se rapproche autant que possible de celle du comptable national. Les contraintes liées à l'organisation de l'Administration dans chaque Etat, à l'ordonnancement des dépenses interdiront sans doute, pour longtemps encore, une correspondance exacte entre les deux domaines.

Dans la mesure où le PCG-Etat s'applique aux unités administratives considérées par le SCN comme des administrations publiques, l'établissement du compte de Revenu et dépenses ne présente pas grande originalité par rapport à ce qui a été décrit précédemment.

Il s'en distingue simplement par le fait que :

- un certain nombre de rubriques figurant au débit des comptes de Revenu et dépenses des autres secteurs ou de Production des branches sont ici au crédit : Impôts directs et indirects, cotisations de sécurité sociale, les redevances obligatoires telles les amendes et pénalités ;

- corrélativement, on trouve au débit des rubriques portées au crédit des comptes des autres agents : Prestations de sécurité sociale, allocations d'assistance, etc.

La rubrique correspondant à Charges et pertes diverses, intitulée ici Autres charges et pertes diverses comporte, comme précédemment, des éléments qui doivent être inscrits dans les Revenus de la propriété (revenus de la terre et des actifs incorporels), qui doivent être portés dans les redevances obligatoires (droits et redevances), qui sont pour le comptable national des transferts courants ventilés par l'Administration soit selon leur nature, soit par agent bénéficiaire. Ce sont les bourses d'études et de voyage, les traitements des médaillés, les transferts courants aux administrations privées (1), les transferts courants aux institutions financières et aux ménages.

Par contre, il apparaît difficile, voire impossible de trouver une correspondance entre la consommation finale -au débit de Revenu et dépenses- et les comptes du PCG-Etat. Conventionnellement, le SCN la définit comme étant égale à la Production pour compte propre, pour laquelle, comme il a déjà été remarqué, il n'y a pas de correspondance au niveau des comptes des unités.

Compte-tenu de ces remarques, la correspondance entre les deux comptabilités peut être résumée par le diagramme 6.

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(1) Le PCG-Etat retient ici la terminologie du SECN. Dans ce système les Administrations privées désignent ce que le SCN dénomme : Institutions privées sans but lucratif au service des ménages.

diagramme n° 6 : Etablissement du compte de Revenu et dépenses des Administrations publiques à partir du tableau des soldes caractéristiques de gestion du PCG-Etat

Soldes caractéristiques de gestion		Revenu et dépenses		Soldes caractéristiques de gestion
débit		débit	crédit	crédit
Consommation de biens et services destinés au fonctionnement de l'unité administrative		consommation finale Revenus prélevés par les entrepreneurs des quasi-sociétés	Excédent d'exploitation Revenus prélevés par les entrepreneurs des quasi-sociétés	Valeur ajoutée Ventes accessoires de biens et services marchands Frais à transférer Frais à immobiliser
Frais de personnel				
Frais financiers				
Subventions versées		Subventions d'exploitation		Subventions de fonctionnement et d'exploitation
Autres charges et pertes diverses		Revenus de la propriété	Impôts indirects Impôts directs	Produits fiscaux Produits financiers
- rémunération de la terre et des actifs incorporels		Primes d'assurances		Autres produits et profits divers
- primes d'assurances		dommages	Revenus de la propriété	- revenus de la terre et des actifs incorporels
- droits et redevances				- remboursements d'assurances
- pertes d'actifs non immobilisés		Transferts courants	Indemnités	- droits et redevances
- bourses d'étude et de voyage		Transferts aux IPSBL	d'assurance	- transferts courants des administrations privées
- traitement de médaillés				- transferts courants des institutions financières
- transferts courants aux administrations privées		Allocations d'assistance	Redevances obligatoires et pénalités	- transferts courants des ménages
- transferts courants aux entreprises		Prestations sociales	Cotisations sociales	- profits exceptionnels
- transferts courants aux ménages		Epargne nette	Transferts courants	- subventions d'équipement et reprises pour quote part
Dotations aux amortissements et provisions				Reprises sur amortissements et provisions
Moins-values de cession				Plus-values de cession
Résultat patrimonial				Résultat patrimonial

\* Les Administrations publiques en tant que secteur institutionnel incluent des unités administratives productrices de biens et services marchands, donc dégagent une valeur ajoutée dans le PCG-Etat

\*\* IPSBL : Institutions privées sans but lucratif au service des ménages.

—— compte intégralement viré à la rubrique correspondante de Revenu et dépenses.

----- contenu du compte partiellement viré à la rubrique correspondante du compte Revenu et dépenses.

## B. Le compte Capital et financement et son annexe financière

Le compte Capital et financement est identique quel que soit l'agent secteur institutionnel, tandis que son annexe financière, si elle contient toujours les mêmes rubriques principales, les décontracte plus ou moins selon l'activité de l'agent considéré.

### 1. Le compte Capital et financement

Ce compte se présente de la façon suivante :

#### Capital et financement

Formation brute de capital fixe	Epargne nette
Variation de stocks	Consommation de capital fixe
<u>Solde</u> : Capacité de financement	<u>Solde</u> des transferts en capitaux reçus.

Deux documents sont utilisés ici :

1) Le tableau des soldes caractéristiques de gestion qui fournit la Consommation de capital fixe ainsi qu'il a été pricé lors de l'établissement du compte de production des branches ;

2) Le tableau de passage aux soldes des comptes patrimoniaux qui donne le montant de la Formation nette de capital fixe sous la forme de la variation du poste Immobilisation corporelles (1) et des postes constituant les Stocks.

La variation des dettes à long terme, des subventions d'équipement, du capital social (partie financée par des apports nouveaux) indiquent le montant du solde des transferts en capitaux reçus.

Le solde du compte, Capacité de financement, qui peut être positif ou négatif, est explicité dans l'annexe financière.

### 2. L'annexe financière

Le PCG-OCAM et le PCG-Etat fournissent une table de correspondance entre les intitulés des postes du bilan et les opérations financières classées par nature, c'est-à-dire selon la classification retenue par le SCN. En ce qui concerne le PCS il est aisé d'établir sur le même modèle une grille de correspondance.

Ce n'est donc pas au niveau des intitulés des rubriques que se pose le problème du passage de la comptabilité des unités à celle de la nation. Il est lié aux principes d'enregistrement des créances.

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(1) Le tableau de passage fournit en effet les augmentations et les diminutions des postes d'immobilisations après déduction des amortissements. Ce sont donc des valeurs nettes. Pour avoir la formation brute de capital fixe, il suffira donc d'ajouter le montant de la consommation de capital fixe, calculée à partir du tableau des soldes caractéristiques de gestion.

a) le comptable national, comme ses confrères appliquant le PCG-OCAM et le PCG-Etat, considère que les créances à moins d'un an sont des créances à court terme, tandis que celles à plus d'un an sont les créances à long terme. Quant au PCS, conformément à la réglementation de la BEAC, les crédits à court terme "sont des crédits d'une durée initiale inférieure ou égale à deux ans" (1). Les crédits dont le terme initial est compris entre un et deux ans sont donc considérés comme du long terme dans la comptabilité nationale et comme du court terme par les banques. Le passage des comptes des banques et établissements financiers à ceux de la nation posera donc un problème pour cette catégorie de crédits.

b) tandis que la comptabilité nationale se fonde sur le terme initial pour le classement des créances, que le PCS et le PCG-Etat adoptent des vues semblables, le PCG-OCAM se fonde sur ce qui est essentiel pour l'entreprise : l'exigibilité des créances. Le terme retenu est donc, non pas le terme initial, mais le terme résiduel.

Toutefois, le PCG-OCAM a prévu un redressement permettant de concilier les besoins de l'entreprise et ceux de la nation. La solution consiste à faire figurer au bilan, dans le poste Dettes à long et moyen termes le montant total et, à porter clairement en déduction la partie exigible à moins d'un an. De sorte que la lecture du bilan indique le montant des crédits selon leur terme initial, tout en conservant l'inscription conforme aux besoins de l'entreprise selon le terme résiduel. Elle signale à la fois le montant à rembourser et le caractère de la créance.

Le poste Emprunt à court terme, majoré de la partie à rembourser à moins d'un an, mais afférente à des crédits d'un terme initial supérieur à un an et qui figure ainsi au bilan, permet l'analyse du marché monétaire.

Le PCG-Etat adopte une présentation identique.

Enfin le passage entre la comptabilité des unités et celle de la nation est facilité par l'existence, tant dans le PCG-OCAM que dans le PCG-Etat, d'une table de correspondance de leurs principaux comptes avec la nomenclature des opérations financières par nature adoptée par le SCN pour l'établissement du compte financier (cf. infra)

c) Le PCS étant destiné à des organismes de crédit, pour lui les opérations de prêt sont enregistrées et classées selon leur terme initial dans les comptes clients, car c'est ce terme initial qui conditionne les possibilités de leur mobilisation.

Les comparaisons de bilans de deux périodes successives et, en pratique, le tableau de passage aux soldes des comptes patrimoniaux, donnent l'évolution des crédits par catégories pour les institutions financières.

Il semble donc possible d'envisager une intégration des comptabilités depuis les unités de production jusqu'aux comptes nationaux. Les relations peuvent être résumées pour les trois plans comptables (PCG-OCAM, PCG-Etat, PCS) par les grilles ci-après.

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(1) UDEAC, Plan comptable sectoriel, op. cit. p. 45

Table de correspondance : comptes principaux O.C.A.M. - Nomenclature des opérations financières par nature

intitulé des comptes	Opérations financières classées par nature						
	1 Numéraire et dépôts à vue transférable	2 Autres dépôts	3 Titre à court termes	4 Obligations	5 Actions et autres participations	6 crédits à court terme	7 Crédits à moyen et long termes
<b>ACTIF</b>							
24 Avances et acomptes sur commandes d'immobilisations en cours						x	x
25 Prêts et autres créances à long et à moyen termes		x					x
26 Titres (autres que les titres à court terme)				x	x		
40 Fournisseurs						x	
41 Clients						x	
42 Personnel						x	
43 Etat et organismes africains ou internationaux						x	
44 Associés						x	
45 Sociétés apparentées						x	
46 Créiteurs et débiteurs divers						x	
51 Prêts à moins d'un an						x	
52 Titres à court terme			x	x	x		
54 Effets et warrants à recevoir						x	
55 Chèques et coupons à encaisser						x	
56 Banques et chèques postaux	x	x					
57 Caisse	x						
<b>PASSIF</b>							
10 Capital					x		
16 Emprunts - obligations				x			
17 Autres emprunts et dettes à long et à moyen termes							x
40 Fournisseurs						x	
41 Clients						x	
42 Personnel						x	
43 Etat et organismes africains ou internationaux						x	
44 Associés						x	
45 Sociétés apparentées						x	
46 Créiteurs et débiteurs divers						x	
50 Emprunts à moins d'un an						x	
53 Effets et warrants à payer						x	
56 Banques et chèques postaux						x	

## Correspondance entre les comptes principaux du PCG-Etat et la nomenclature des opérations financières par nature

x	x	x	x	2 Autres dépôts
x				3 Titres à court terme
	x			4 Obligations
	x			5 Actions et autres participations
x	x	x	x	6 Crédits à court terme
	(x)	x	x	7 Crédits à moyen et long termes
				8 Réserves techniques d'assurance
				9 Autres moyens et paiements internationaux

Intitulé des comptes	Opérations financières classées par nature								
	1 Numéraire et dépôts à vue transférable	2 Autres dépôts	3 Titres à court terme	4 Obligations	5 Actions et autres participations	6 Crédits à court terme	7 Crédits à moyen et long termes	8 Réserves techniques d'assurance	9 Autres moyens et paiements internationaux
PASSIF									
10 - Fonds de dotation-capital					x				
11 - Fonds réservés								(x)	
15 - Emprunts à long et à moyen termes contractés à l'extérieur				x			x		
16 - Emprunts à long et à moyen termes contractés à l'intérieur				x			x		
17 - Dettes résultant d'engagements à long et à moyen termes							x		
18 - Autres dettes à long et moyen termes							x		
36 - Relations avec les services non personnalisés et les régisseurs d'avances		x				x			
37 - Relations avec les budgets annexes						x			
40 - Créanciers ordinaires		x				x			
42 - Correspondants - organismes dont l'unité administrative assure le service financier		x							
43 - Correspondants-autres organismes résidents		x							
44 - Etats étrangers et organismes étrangers ou internationaux						x			
45 - Déposants	x	x							

Sans doute dans la pratique cette procédure se heurtera-t-elle à des obstacles :

En premier lieu, il convient de souligner que l'intégration des comptes des unités au sein d'une même branche ou d'un même secteur institutionnel supposerait des consolidations, et non pas des sommations ; c'est-à-dire une élimination des prestations réciproques au sein de l'agent branche ou secteur considéré. Dans une certaine mesure, le PCG-OCAM fournit un début de réponse par l'ouverture de comptes de liaison dans le cadre des groupes, mais hormis cette hypothèse, donc pour la grande majorité des entreprises, ce problème des prestations réciproques sera difficilement soluble.

En second lieu, toutes les entreprises ne tiennent pas une comptabilité ou même ne dressent ni bilan, ni tableau des soldes caractéristiques de gestion. De sorte que l'intégration des comptes n'intéresse que celles qui ont une certaine surface et que l'on considère dans certains pays comme constituant le secteur "structuré".

Cette normalisation comptable sur laquelle repose toute tentative d'intégration des comptes permettrait d'accroître la fiabilité des informations favorisant les recoupements entre les comptes et des entreprises, entre ces comptes et les données de certaines administrations, en particulier celles des douanes.

La normalisation comptable dans la perspective de l'intégration des comptabilités à la comptabilité nationale apparaît ainsi comme un outil au service d'une meilleure direction de l'économie nationale.



Grille de passage du tableau des soldes caractéristiques de gestion du PCG-OCAM  
aux comptes du SCN

Comptes du SCN débit				Soldes caractéristiques de gestion	Comptes du SCN crédit			
P	RD	CF	F		P	RD	CF	F
				<u>Détermination de la marge brute</u>				
				Ventes de marchandise	+			
				Coût des stocks vendus	-			
				<u>Détermination de la valeur ajoutée</u>				
				Production vendue	+			
				Production stockée	+			
		+		Travaux faits par l'entreprise pour elle-même	+			
				Frais à immobiliser et à transférer				
+				Matières et fournitures consommées				
+				Transports consommés				
+				Autres services consommés				
				<u>Détermination du résultat avant impôt</u>				
				Produits et profits divers	+	+	+	+
				Intérêts et dividendes reçus		+		
				Subventions d'exploitation et hors exploitation		-		
-				Reprises sur amortissements et provisions			-	
-				Plus-values de cession				
+	+	+	+	Charges et pertes diverses				
	+			Ristournes accordées				
+				Frais de personnel				
+	+			Impôts et taxes				
	+			Intérêts				
+				Dotations aux amortissements			+	
+				Dotations aux provisions			+	
				Moins-values de cession				
	+			Impôt sur le résultat				
	+			Résultat à affecter				

N.B. : les signes indiquent la manière dont sont vidés les comptes du tableau des soldes caractéristiques de gestion dans les comptes du SCN

Abréviation : P compte de production, RD compte de Revenu et dépenses, CF compte de capital et de financement, F annexe financière.

Grille de passage des comptes du tableau des flux et soldes caractéristiques de gestion du PCS des banques et établissements financiers aux comptes du SCN

Comptes du SCN débit				Flux et soldes caractéristiques	Comptes du SCN crédit			
P	RD	CF	F		P	RD	CF	F
				Marge d'activité bancaire	+			
				Services produits	+			
				Production pour l'entreprise	+			
				Frais à transférer				
-				Produits et profits divers	+	+	+	+
				Subventions d'exploitation				
				Intérêts et dividendes		+		
				Plus-values de cession				
+				Fournitures consommées				
+				Transports consommés				
+				Autres services consommés				
+				Frais de personnel				
+	+			Impôts et taxes				
	+			Intérêts sur ressources				
+				Dotations aux amortissements			+	
+				Dotations aux provisions			+	
				Moins-values de cession				
	+			Impôts sur le résultat				
	+			Résultat à affecter				

N.B. : les mêmes abréviations et notations que dans le tableau précédent ont été retenues.

## Grille de passage des comptes du PCG-Etat aux comptes du SCN

Comptes du SCN débit				Soldes caractéristiques de gestion	Comptes du SCN crédit			
P	RD	CF	F		P	RD	CF	F
				<u>Détermination de la marge brute</u>				
				Ventes de marchandises	+			
				Stocks vendus	-			
				<u>Détermination de la valeur ajoutée</u>				
				Marge brute (solde du compte précédent)	+			
				Production vendue	+			
				Production stockée	+			
				Production effectuée par l'entreprise pour elle-même	+			
+				Consommations intermédiaires				
				<u>Détermination du résultat net avant impôt</u>				
				Ventes accessoires de biens et services	+			
				Valeur ajoutée (solde du compte précédent)	+			
				Avantages en nature	+			
				Frais à transférer et à immobiliser				
-				Subventions d'exploitation et de fonc- tionnement			+	
				Transferts reçus		+		
				Autres produits et profits divers		+		+
+				Reprises sur amortissements et provisions			+	
				Plus-values de cession				
				Consommations de biens et services liés au fonctionnement de l'unité adminis- trative				
+				Frais de personnel				
+	+			Impôts et taxes				
	+			Frais financiers				
	+			Subventions versées				
+	+	+	+	Autres charges et pertes diverses				
+				Dotations aux amortissements			+	
+				Dotations aux provisions			+	
				Moins-values de cession				

## INDUSTRIAL SURVEYS AND NATIONAL ACCOUNTS IN KENYA

by KANTI MUNNSAD

The industrial sector comprising mining and quarrying, manufacturing, electricity and water, and construction now contributes nearly 19 per cent of the gross domestic product (GDP) of Kenya. In terms of the individual sectors manufacturing contributes nearly 13 per cent of the GDP, followed by construction, nearly 4 per cent ; electricity and water, nearly 1 per cent but mining and quarrying produces less than 1 per cent. Over time the share of the industrial sector to Kenya's GDP has been rising gradually from nearly 13 per cent in 1963 to 17 per cent in 1972 and approximately 19 per cent in 1980.

The basic sources of information for the national accounts for the industrial sector except electricity and water are the ad hoc censuses and surveys conducted by the Central Bureau of Statistics. In addition monthly surveys are also carried out which provide the necessary information for the calculation of the quantum index of manufacturing. A quantum index is also compiled for mining from information supplied by the Mines and Geological Department on production by the mining companies. In addition to the above indexes a price index based on the type of structure is compiled for the construction sector. These indexes are used for the sectoral GDP calculation at constant prices and also to assist in the deflation of capital formation at current prices. A wholesale price index is also now available for manufacturing sector.

### I - INDUSTRIAL CENSUSES/SURVEYS AND INDEXES

#### 1.1. Scope and Coverage

The first industrial production survey for Kenya was conducted for the reference year 1954. Other surveys have been conducted for the years 1956, 1957, 1961 and annually since 1963. The activities which fall within the scope of the surveys are mining and quarrying, manufacturing and construction. For electricity and water the activity is confined to a few large enterprises ; details of which are obtained from their annual accounts. The Census/Surveys cover firms in urban areas and all large establishments in rural areas which are included in the

directory of such establishments maintained by the Central Bureau of Statistics. A rural establishment is included in the directory if it has a telephone or a postal contact or is registered by the Registrar-General's Department. Enquiries for the years 1961, 1963, 1967, 1972 and 1977 took the form of censuses. Upto and including 1963 all establishments engaging 5 or more employees were covered and from 1964 to 1967 coverage was restricted to firms engaging 50 or more employees except 1967 which included establishments employing 5 or more persons. Surveys for 1970 and 1971 covered firms engaging 50 or more employees plus a 25 per cent sample of these engaging between 20 to 49 employees. Coverage was extended to all firms in the 1972 and 1977 censuses. For the 1977 census all firms employing 20 or more persons were covered ; for firms employing 5 to 19 persons a 50 per cent sample was taken and firms employing 1 to 4 persons a 10 per cent sample was taken.

### 1.2. Questionnaire and Content

For the census of Industrial Production 1977 three sets of questionnaires were used. A simplified questionnaire seeking basic information on the firm and aggregates of income and expenditure (split into salaries and wages and other expenditure) was sent to all firms falling within the scope of the census and engaging less than 5 persons. The other sets of questionnaires contained greater detail and included questions on employment, value of stocks by kind of stock, value of the various outputs including the value of own account construction at producer prices ; intermediate consumption at purchaser prices ; labour costs, operating surplus and the consumption of fixed capital and capital formation classified by type of asset. Of these, one set was sent to all firms engaging more than 5 persons in the mining and manufacturing sector. The other set was sent to firms in the construction sector.

For the annual surveys two sets of questionnaires are used. Both the questionnaires contain detailed information on income and expenditure and supplementary questions on capital assets. The basic content of the questionnaires is retained for all the surveys. As with the census one set of forms is sent to firms engaged in construction.

### 1.3. Level of Response

For the annual surveys which only cover large firms a response rate of more than 80 per cent is achieved. In the census, however, due to the coverage of firms engaging less than 20 persons, which have a relatively higher non-response rate, an overall response rate of 65 per cent is realised. These response rates are based on number of firms. When measured in terms of value of output, or employment, however, the response rate is much higher.

#### 1.4. Estimating for Non-Respondents

Apart from the surveys of industrial production the Central Bureau of Statistics also carries out annually Survey of Employees and Self Employed Persons and a quarterly Business Expectations Enquiry (BEE). Information collected in both these surveys is used to help in estimating for non-response in the industrial surveys.

The Survey of Employees and Self-Employed persons covers all establishments in urban areas having a permanent work place and all large establishments including those in rural areas. For each, information is sought on the number of persons engaged, subclassified into wage employees or into self-employed and unpaid family workers. Also recorded are details of their earnings which include cash income, overtime pay and bonuses as well as remuneration in kind such as free housing, food, passage allowances, etc.

The BEE covers all activities other than agricultural and those pursued by small scale enterprises in rural areas. All firms with 50 or more persons are included and a 25 per cent sample is taken of establishments with 20 to 49 persons engaged. However, because of the continuing problem of non-response, attempts are now being made to restrict the numbers covered by the enquiries, possibly by having a higher employment cut-off point such as 100 or more employees. These establishments are also included in the annual surveys of industrial production. The survey is undertaken quarterly and its objective is to obtain quick up-to-date information. Only a limited amount of detail is therefore requested. The main items on which information is sought are sales, stock level and numbers engaged. For each item, actual figures for the last two quarters are requested as well as expected figures for the next two quarters and for the whole of the calendar year. In this case it has been observed that estimates made too early in the year are subject to wide margins of error so forecasts are only requested for the second half of the year.

#### 1.5. Census Non-Respondents

For firms engaging 20 persons, the percentage increase in earnings for the current year over the immediate past year, as reported in the annual employment surveys, is applied to the labour costs of the firm as reported in the annual survey of Industrial Production for the previous year in order to obtain an estimate of labour costs for the current year. The same increase is applied to the GDP of the firm for the previous year to obtain the GDP for the current year. For output, however, the percentage increase in sales as reported by the firm in the

BEE is used to derive the output for the current year. When a firm covered in the Census of Industrial Production was also a non-respondent in the annual Survey of Industrial Production, the earning as reported in the annual employment survey is used as a proxy for the labour costs of the firm. Similarly the value of sales as reported in the BEE is used as a proxy for the output of the firm. The GDP is then obtained by applying the labour costs/GDP ratio of similar sized firms in the same activity to the proxy labour costs of the firm.

When a firm has been a non-respondent in all the three surveys, estimates for it are derived by using the averages for similar sized firms in the same activity which have responded to the census.

The BEE and the annual surveys do not cover firms with less than 20 persons engaged. These are, however, covered in the annual employment survey. Thus the only information available for non-responding firms with 1 to 4 and 5 to 19 persons engaged is that of earnings. For non-respondents in these size groups the ratios of labour costs to GDP and output for similar-sized responding firms in the same activity is applied to the earnings as obtained from the employment surveys to derive estimates of the GDP and output of the non-responding firm.

#### 1.6. Survey Non-Respondents

As indicated earlier since 1970 the annual surveys of industrial production have covered all firms with 50 and more persons engaged and a 25 per cent sample of firms with 20-49 persons engaged. The method used in the estimation of non-respondents in these surveys is the same as described for the censuses. It should be noted, however, that the sample of firms used the BEE is the same as the one for the annual surveys of industrial production.

### II - MONTHLY SURVEY OF INDUSTRIAL PRODUCTION

#### 2.1. Purpose of the Survey

The main purpose of this survey is to provide necessary data for the calculation of monthly and annual index numbers of the volume of manufacturing output. The survey covers about 800 manufacturing firms with a 100 per cent coverage of firms engaging 50 or more persons and a sample of firms engaging less than 50 persons. Firms engaged in mining and construction are not covered in the monthly surveys. Every month the firms return to the Central Bureau of Statistics (CBS) completed questionnaires containing among other details, the quantity and value of production and sales of some 196 indicators selected for the calculation of the manufacturing index. The indicators have been selected in such a way that the value of an indicator or a group of indicators represents 75 per cent or more of the estimated value of the output of that activity. The selection of firms with less than 50 persons engaged is also based on the above criterion.

Of the 196 indicators all but two are indicators of physical output ; for the other two which pertain to non-electrical machinery and furniture and fixtures and where there is non acceptable measure of output, employment is used as the indicator of output.

The response rate for the monthly survey has been fairly good ; at present on the average, about 65 per cent response rate is achieved. Where a firm has not responded for the month in reference, the quantity and value of sales and production of the indicators applicable to the firm are estimated normally by taking the average monthly production for the last 12 months. However, where seasonal movements are obvious, these are taken into account in the estimating procedure.

### III - QUANTITY INDEX OF MANUFACTURING

Based on the information collected in the monthly surveys of Industrial Production a quantity index of manufacturing has now been compiled for a number of years. In earlier years the Paasche and Laspeyre formulae were used in the compilation of the index. The weights used in the index were derived from the GDP originating in each activity obtained from the annual surveys. However, through experience it was found that the fixed-weight Laspeyre formula did not give the best results because of bias introduced by the continuous increase in the range of products manufactured as well as the un-even growth of the various activities in manufacturing. In view of this an attempt was made to use a current-weighted Paasche formula. However, due to the provisional and incomplete nature of current data this also did not give really satisfactory results and the index was compiled using the Fisher's Ideal Formula. Lately, however, a system of rolling weights has been used whereby the weight for each activity and the indicators within each activity are the average weights for the preceding two years and including estimates for the current year. As present the series is a chained Laspeyre type index which is based on 1976 for purposes of presentation.

### IV - QUANTITY INDEX OF MINING AND QUARRYING

The monthly surveys do not cover firms engaged in mining and quarrying. The relevant information for the calculation of the Laspeyre's Quantity Index of Mining and Quarrying is obtained from the Mines and Geological Department. This information is supplied to the Department by the various firms annually. Unlike the rolling systems of weights in the manufacturing index, fixed weights, based on the contribution of GDP of each activity, are used in the index. The base for the index is 1976. This index is known to be faulty because of often unsatisfactory data on output.



## V - CONSTRUCTION COST INDEX

The Central Bureau of Statistics has been compiling a construction cost index since 1973. The original index measured the change in the cost per square foot of various constructions. This index, however, had its defects in that the square foot costs for the various types of construction were unweighted, and the index could not yield information of the reasons for variations arising from changes in prices of various input components.

For these reasons and also due to the rising construction costs it was decided to develop an index which would reflect more accurately the changes in building and civil engineering costs at the disaggregated level of inputs.

At present a 'composite' index of construction costs with base 1972 is compiled. The 'constituents' of the composite index are the costs indexes of residential building, non-residential buildings and civil engineering. The method adopted for each of the 'constituents' is to price the inputs. The various items of materials and labour for each of the index was determined in consultation with reputed contractors operating in Kenya and the Kenya Association of Building and Civil Engineering Contractors. For the indexes on residential and non-residential buildings, the main groupings of indicators are concrete products, wood products, steel products, hardware and windows, plumbing and sanitary fixtures, electrical installations and labour. For the index on civil engineering a pricing of some 28 different indicators is attempted.

The weight for each of the 'constituent' index is in the final index based on the percentage share of GDP of firms specialising in construction of buildings and roads. This was basically derived from the survey of Industrial Production 1971. Using this method weights were ascertained for two categories of construction that is buildings and other construction. The further division into residential and non-residential buildings was derived from the total value of reported completion of both public and private residential and non-residential buildings for the years 1970-1972.

For the purpose of allocating the aggregate weights to the component items of each index, a survey was undertaken by the Central Bureau of Statistics to determine the expenditure in the base year on each of the indicators. Based on this information a weight was allocated to each indicator.

Laspeyre's formula is used for computing the index for each of the three 'constituents'. These are then aggregated by taking the weighted arithmetic mean to obtain the 'composite' index. The index has been computed on a quarterly basis for 1973 and 1974 and on a monthly basis from January, 1975 onwards.

## VI - NATIONAL ACCOUNTS - MINING AND QUARRYING SECTOR

### 6.1. Estimates at Current Prices

As detailed earlier, the scope of the Censuses of Industrial Production extends over all firms engaged in mining and quarrying. Aggregates of output, intermediate consumption, GDP, Operating surplus and labour costs, required for the national accounts, are therefore directly obtained from the analysis after estimation of non-respondents and grossing up where samples have been taken. For the intercensal years the information is updated through the annual surveys of Industrial Production. For firms engaging less than 20 persons, which are covered in the census but not covered in the annual surveys, it is assumed that the annual percentage increase in the value of their output is the same as that for firms with 20 to 49 persons engaged. The annual employment survey provides the wage bill of such firms. A further assumption is made that the other components of value added, for firms with less than 20 persons engaged, have the same ratio to the labour costs as in the census year. Intermediate consumption of these establishments is obtained as a residual, that is, the difference between the estimated value of output and value added.

### 6.2. Estimates of Constant Prices

The quantity index of mining is used to obtain aggregates at constant prices. Base year estimates of the value of output, intermediate consumption and value added are projected forward based on this indicator of physical output.

## VII - MANUFACTURING SECTOR

### 7.1. Estimates at Current Prices

Separate estimates of the value of output, intermediate consumption and value added are made for the private and public enterprises. Private enterprises have been further sub-classified into : -

- Urban and Large Rural Establishments
- Other Rural Establishments

The urban and large rural establishments fall within the scope of censuses/surveys of industrial production and therefore aggregates of output, intermediate consumption, value added, operating surplus and labour costs are obtained from the results of these surveys. These are derived in the same way as described above for the mining sector.

The other rural establishments, which do not fall within the scope of the censuses/surveys, contribute an estimated 1 per cent of the output of the private sector manufacturing. The enterprises in this subsector manufacture mainly dairy and barley products, beer, textiles, clothing, footwear, wood and cork products, furniture and fixtures, pottery and clay products, soap and handcrafts ; they also undertake tanning and curing of hides and skins, saw milling, wood carving and boat building.

A survey of Small Scale Rural Enterprises was held in 1972 to obtain information about such activities. Information was obtained on sales and the value of inputs. Since 1972 annual estimated required for the national accounts have been obtained by running forward the 1972 figures on the value of output and intermediate consumption in line with an index of the estimated gross domestic product of the traditional economy at current prices which in real terms approximates to the per cent growth of the population. The traditional economy includes such activities as building and construction by households for their own use, fishing for own consumption and water and firewood collection by households in certain areas of the country. These activities are classified as "traditional" because, even though a proportion of the inputs are purchased from the monetary economy, the output is not sold.

The public sector comprises parastatal bodies undertaking enterprise activities and those enterprises engaged in manufacturing and in which the public sector has 51 per cent or more share in the equity capital. In addition the public sector includes the manufacturing enterprise activities of the Central Government and local authorities and those of their activities that use technological processes similar to those used by the private sector. The Government Printer and Ministry of Works are examples of the latter category.

The required national accounts aggregates for parastatal bodies and firms with majority holding of equity capital by the public sector are obtained direct from the enterprises themselves, and for the Government Printer, Ministry of Works and enterprises of the local authorities from the published accounts of Central Government and local authorities.

## 7.2. Estimates at Constant Prices

For the calculation of output, intermediate consumption and value added at constant prices, for urban and large rural establishments and public enterprises, the Quantum Index of Manufacturing is used. For each activity the aggregates in the base year are run forward on the corresponding index of production.

For the other rural establishments the value of output and intermediate consumption is run forward in line with an index of estimated gross domestic product of the traditional economy at constant prices.

VIII - BUILDING AND CONSTRUCTION8.1. The production of the sector is estimated as follows :

- Monetary Economy :        Private sector
  - Private contractors
  - Own account building and construction activities of
    - . Large farms
    - . East African Power & Lighting Company Ltd.,
- Monetary Economy :        Public Sector
  - Own account building and construction activities of :
    - . Kenya Railways Corporation
    - . Kenya Ports Authority
    - . Kenya Posts & Telecommunication Corporation
    - . Ministry of Works
    - . Forestry Department
    - . Local authorities.

8.2. Estimates at Current Prices - Monetary Economy -  
Private Sector

For the private contractors aggregates of labour cost, operating surplus, value added, intermediate consumption and output are obtained from the Census/Surveys of Industrial Production. For the annual surveys which do not cover firms with less than 20 persons engaged estimation of these firms is done in the same way as outlined above for the manufacturing sector.

The annual Census of Large Farms provides information on the value of residential and non-residential building and other construction work undertaken on large farms. From this total, the value of building work undertaken on large farms by contractors is subtracted, to avoid double counting. Of the total building and construction work undertaken on large farms, 14 per cent is taken as being contracted out. This figure is based on an ad hoc enquiry made for large farms a few years ago.

For expenditure by large farms on maintenance of buildings and construction, that is, the total after the value of work contracted out has been deducted, labour costs are estimated as being equal to 20 per cent of the value of own account construction. This figure is based on the proportion of contractors' labour costs to the value of output for similar construction work. Since no imputation is made of a return on the assets employed in such building and construction, intermediate consumption of large farms is the difference between their value of output and labour costs.

The East African Power and Lighting Company annually provides the information needed on the value of its own account building and construction activities.

### 8.3. Monetary Economy : Public Sector

The Kenya Railways Corporation, Kenya Ports Authority and Kenya Posts and Telecommunication Corporation all carry out own account building and construction activities. The information needed is obtained through a special analysis of their accounts undertaken by the Central Bureau of Statistics.

For the Ministry of Works, the source of information is the accounts of the Central Government Supplemented by special information from the Ministry. The value of output - equal to total expenditure on goods and services and personal employments - is obtained from the recurrent and development accounts.

From the value of building and construction so derived is deducted the value of building and construction work contracted out in order to obtain the value of output on own account. To this value of output of own account building are added two imputed values, namely, the employer's contribution to pensions and the value of consumption of fixed capital. The latter is based on the average replacement cost of lorries and road building equipment during the previous three years.

Further a scrutiny of the relevant expenditures, together with some additional prorations, enables the value of output to be split between maintenance and capital expenditures on residential and non-residential building, and on roads and other construction works.

The estimates of the value of own account building and construction work undertaken by the Forest Department are made from the information supplied annually by the Department.

All local authorities are circulated for information on the value of residential and non-residential buildings and other construction work undertaken each year ; information on labour costs is also obtained. Maintenance expenditure is assumed to be equal to 10 per cent of the value of such capital expenditure. The two together give the total value of output of building and

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construction by local authorities. The value of work contracted out is estimated at 56.8 per cent of the value of output ; this is deducted from the total output to obtain the value of output of own account work. This percentage deduction is based on an ad hoc enquiry conducted some years ago. Intermediate consumption is calculated as the difference between the value of own account output and labour costs.

#### 8.4. Eliminating Discrepancy

The value of output so derived obviously needs to tie in with the estimate of capital expenditure on building and construction obtained from the expenditure. In fact, there always is a discrepancy.

The first step in eliminating the discrepancy is to estimate the maintenance component in the value of output of building and construction, since it is impossible for building contractors and others engaged in this activity to subdivide. Hence, alternative means are adopted to estimate the maintenance component. The value of maintenance on residential buildings is estimated as an input into ownership of dwellings. Maintenance expenditure on roads and non-residential buildings owned by the Central Government is obtained from its accounts. The only missing estimate then left to be computed is the value of maintenance on private non-residential buildings. To estimate this, investment at constant prices in private non-residential building during each of the past 10 years is aggregated and added to a similar estimate for the 25 years prior to this period. Since no data exist for this later period, the estimated value of private non-residential buildings built during this latter period is based on the assumption that the annual rate of growth of such investment was equal to that of the immediate past decade. The life of a non-residential building is assumed to be 35 years. The estimate on the stock of non-residential buildings at constant prices is next converted to current prices using the Non-Residential Building Cost Index. Two per cent of this estimated replacement cost is taken as the value of maintenance work on these buildings. The various estimates of maintenance - on residential and non-residential buildings and on other construction works - are then added to obtain the overall estimate on the value of maintenance.

This estimate of maintenance is added to the estimate of capital formation in buildings and construction works obtained from the expenditure side. The capital formation estimate, however, is first revalued at producer prices. The estimates of capital formation from the expenditure side are adopted since they are believed to be more reliable than those from the production side. The final step is to revise the original estimates of intermediate consumption and value added. These are multiplied by the ratio of the revised value of the output of building and construction to the original value.

### 8.5. Estimates at Constant Prices

The value of output at constant prices is derived by deflating the components of the value of output - residential building, non-residential building and road construction - by the appropriate cost index, namely, the Building Cost Index, the Non-Residential Building Cost Index and the Civil Engineering Cost Index. For other construction, the deflator is the weighted average of the Non-Residential Building Cost Index and the Civil Engineering Cost Index. Base year figures of Intermediate consumption and value added are run forward in line with the value of output at constant prices.

## IX - ELECTRICITY AND WATER

### 9.1. Estimates at Current Prices - Electricity

All the information required - value of output, intermediate consumption, personal emoluments, consumption of fixed capital, etc.- is received from the two enterprises undertaking generation and distribution of electricity in the country.

### 9.2. Water

In the monetary economy, the collection, processing and distribution of water is mainly a public sector activity undertaken by the Ministry of Water Development, the Mombasa Water Supply, the Mombasa Pipeline Board, and by the water departments of various local authorities. Less than 1 per cent of the activity in this subsector is undertaken by private enterprises. The relevant information on the operations of the public sector institutions and enterprises engaged in this activity is readily available from their published accounts. The private concerns are covered by the annual employment survey, which provides information about their total labour cost. It is assumed that the ratios of the value of output and of intermediate consumption to labour costs prevailing for the water departments of municipal councils are also relevant to these private concerns.

### 9.3. Electricity

The base year estimates are run forward on an index of kilowatt hour output.

#### 9.4. Water

The method of obtaining constant price estimates for the monetary economy is similar to that for electricity. The index in this case is based on the quantity of water sold for consumption by the water supply authorities of Mombasa and Nairobi Municipalities.

#### 9.5. Provisional Estimates

The method of obtaining the national accounts aggregates described above refer to the final estimates. However, for the activities mining and quarrying, manufacturing and construction provisional estimates of output and value added are made differently. The Survey of Industrial Production obtain detailed information and it takes time for the questionnaires to be completed and returned. Usually, they are not received by the Central Bureau of Statistics until near the end of the year subsequent to the year of reference.

Provisional estimates, however, are required much earlier, by the end of April following the year of reference. The fourth round of the quarterly Business Expectations Enquiry - undertaken at the end of the fourth quarter of the calendar year - provides annual figures from which the provisional estimates of output for these sectors are made. The enquiry covers the same establishments as the annual surveys. However, since its questionnaire is simple and secures limited information, it is quickly completed and returned. Value of sales is one of the principal items of information it supplies.

The method for making the provisional estimates is the same for each of the three sectors. This is first to calculate, from data provided by the Business Expectations Enquiry, the percentage change in sales in the current year for establishments employing 50 or more persons. This percentage is then applied to the previous year's final estimate of the value of output for establishments in this size class to obtain a provisional estimate of the value of output in the current year. The process is repeated for establishments with 20 to 49 employees and for establishment employing less than 20 persons. However, as the latter are not covered by the Business Expectations Enquiry, it is assumed that the percentage change in sales is the same as that calculated for establishments with 20-49 employees.

Provisional estimates of value added are similarly made. First, the percentage change in the wage bill in the current year is calculated for establishments employing 50 or more persons using information supplied by the annual employment survey. Then this percentage is applied to the previous year's final estimate of value added for establishments in this size class to obtain provisional estimate of value added in the current year. The



implicit assumption here is that the ratio of the wage bill to the other components of value added remains unchanged between the two years. The procedure is repeated for those establishments with 20-49 employees and for those employing less than 20 persons. The annual employment survey also covers establishments employing less than 20 persons.

For sectors other than the three discussed above, the source and methods for making the final and provisional estimates are the same. However, the data originally sent in by respondents are sometimes changed on cross verification with other comparable data. Occasionally, when the information is not received in time, estimates are based on past trends and relationships with other series.

PASSAGE DU PLAN COMPTABLE GENERAL DES ENTREPRISES AUX COMPTES  
DES SOCIETES ET QUASI-SOCIETES NON FINANCIERES :  
COMMENT LEVER CERTAINES DIFFICULTES ?

by Michel MOUYELO-KATOULA

I - LE PLAN COMPTABLE GENERAL DES ENTREPRISES

Le Plan Comptable Général des Entreprises mis à l'étude au sein du Secrétariat Général dès décembre 1967 vise la normalisation des règles de quantification et d'écritures comptables dans toutes les entreprises, soumises à la tenue d'une Comptabilité. Il a été adopté le 27 novembre 1970 par le Conseil des Chefs d'Etat de l'Union, mais les premiers documents fiscaux qui devaient être établis selon les énoncés de ce Plan se rapportaient aux résultats des exercices clos au 31 décembre 1971 pour les Républiques Centrafricaine, Populaire du Congo, et Gabonaise, et au 30 juin 1972 pour la République Camerounaise.

La normalisation complète de la comptabilité des entreprises installées sur le territoire de l'Union exigée dès le 1er janvier 1972 pour toutes les entreprises de Centrafrique, du Congo et du Gabon, le 1er Janvier 1972 pour les entreprises de Centrafrique, du Congo et du Gabon, le 1er juillet 1972 pour toutes les autres entreprises du Cameroun, peut être considérée comme étant largement effectuée dès 1975. Les difficultés rencontrées dans l'application du Plan Comptable ont été étudiées par une commission mixte OCAM-UDEAC réunie à Bangui du 8 au 13 octobre 1978 qui en a alors préparé une deuxième édition adoptée par le Conseil des Chefs d'Etat de l'UDEAC le 12 décembre 1979 par acte n° 8/79-UDEAC-261.

1.1 Présentation du Plan Comptable Général

Le Plan Comptable Général réalise la réunion et la conciliation des besoins d'informations exprimés par tous ceux qui s'intéressent aux activités des entreprises. Chacun d'eux a sa hiérarchie de préférence des données et résultats comptables dont il trouve les niveaux et détails nécessaires dans cet ensemble cohérent de concepts, et de règles d'évaluation et d'enregistrement comptables.

1.2. Le Plan Comptable Général au service du Comptable National

Pour le Comptable National, le champ d'application du Plan Comptable Général des entreprises (PCGE-OCAM) s'identifie tant avec les secteurs institutionnels des sociétés et quasi-sociétés non financières et des institutions

financières, qu'avec les principaux producteurs de biens et services. Le PCG-OCAM a été conçu de manière à fournir à la Comptabilité Nationale les principales grandeurs de la production de biens et services marchands, ainsi que des approches satisfaisantes de certains indices caractéristiques tels que la valeur ajoutée, l'excédent net ou brut d'exploitation, l'épargne brute, la formation brute de capital fixe etc ...

Les soldes caractéristiques de gestion, déterminés en cascade dans le tableau 1 qui leur est consacré préfigurent bien, aux opérations hors exploitation près, les soldes effectifs et implicites des comptes de production des branches d'activité marchande ainsi que les revenus et dépenses des secteurs institutionnels correspondants, tandis que les mouvements patrimoniaux enregistrés dans le tableau 2 correspondent aux flux de capital et de financement.

La correspondance entre les concepts n'est toujours pas aussi immédiate que l'on aurait souhaité. Les exigences, parfois contradictoires, d'utilisateurs différents modulées par les contraintes de gestion, n'ont pas permis aux concepteurs du PCG-OCAM de retenir des notions et règles comptables qui auraient toujours assuré un passage automatique des résultats d'entreprises aux agrégats des branches d'activités marchandes et secteurs institutionnels intéressés.

Certaines grandeurs, au lieu d'être définies avec exactitude en tant que somme algébrique d'éléments comptables, sont plutôt approchées avec des degrés de précision très variables.

Tant de guides et de notes ont déjà été rédigés sur l'élaboration des comptes nationaux en général, et particulièrement sur le passage du Plan Comptable Général des Entreprises, dénommé ici PCG-OCAM, aux comptes de biens et services et surtout aux comptes des sociétés et quasi-sociétés non financières, qu'il paraît superflu d'écrire un papier supplémentaire sur ces règles méthodologiques.

Cependant, il apparaît, à la lecture des ouvrages méthodologiques déjà édités, que certains points restent particulièrement délicats. Prenons ici le cas spécifique des tableaux de correspondance PCG-OCAM-SCN (Système de Comptabilité Nationale des Nations Unies). Les discussions sur la détermination de la consommation de capital fixe, par exemple demeurent ouvertes. Et il semble, après analyse des méthodes préconisées pour se donner une mesure satisfaisante de ce poste, que le PCG-OCAM ne fournit pas tous les éléments nécessaires pour un tel calcul, et qu'il importe de recourir à des estimations statistiques qui tiennent compte, entre autres données, des prix courants sur le marché des biens d'actifs analogues à ceux dont on veut circonscrire les amortissements économiques. Nous reviendrons sur cet exemple plus loin, après avoir examiné les postes qui le précèdent dans la codification des éléments des comptes de production des branches d'activité marchande, puis nous aborderons certains points litigieux des comptes de revenus et de dépenses et de capital et financement.

Il convient de souligner que nous n'avons pas la prétention de proposer les solutions les meilleures, mais nous pensons pouvoir orienter la réflexion selon des directions différentes, voire fixer l'attention sur d'autres artifices de calculs. Les gains de précisions dus à certaines méthodes ne sont certainement pas importants, relativement à leur complexité, mais ils témoignent d'une plus grande fidélité aux prescriptions du S.C.N.

Dans le compte de production, c'est la production elle-même ainsi que les consommations intermédiaires en tant que comprenant des frais transférés ou à transférer qui mériteraient d'être considérées, avant de revoir le problème de la consommation de capital fixe.

Dans le compte de revenu et de dépenses, l'accent sera mis sur le "Revenu prélevé par les entrepreneurs de quasi-sociétés", et les "prestations sociales des employeurs".

Enfin, dans le compte de capital et financement, l'analyse portera sur le traitement des soldes des comptes de régies d'avances et d'accréditifs (compte du PCG-OCAM), et des avances et acomptes sur commandes d'immobilisations en cours (compte 24 du PCG-OCAM) et sur les apports en capital des propriétaires dans les quasi-sociétés.

## II - COMPTE DE PRODUCTION

### 2.1. Production

La production, réalisée dans le cadre de l'exploitation courante d'une entreprise, s'obtient par l'addition simple des soldes des comptes 80 = marge brute, 71 = Production vendue, 72 = Production stockée et 73 = Travaux faits par l'entreprise pour elle-même. Elle est en général d'un montant inférieur à la production aux prix départ-usine telle que définie en comptabilité nationale. En effet les ressources du compte de production sont constituées par :

- a) ce que l'on pourrait considérer comme étant une "marge brute totale", somme de la marge brute et de l'excédent des ventes de marchandises hors exploitation (compte 070) sur le coût des stocks vendus hors exploitation (compte 060)
- b) la production vendue, en exploitation et hors exploitation (comptes 71-071), évaluée toutes les taxes comprises. Les taxes frappant la consommation, et dont les entreprises productrices ou commerciales ne sont que des collecteurs pour le compte de l'Etat, doivent être reprises ici, en même temps qu'elles sont ajoutées aux Impôts et taxes des comptes 66 et 066 pour constituer le poste 1.3.4. des Impôts indirects.
- c) la production stockée (comptes 72 et 072)
- d) les travaux faits par l'entreprise pour elle-même (73)

Cette production ne comprend pas les frais à transférer (compte 073) qu'il importe, par ailleurs, d'exclure des comptes de charges dans lesquels ils avaient été préalablement enregistrés, avant transfert dans les comptes d'immobilisation ou de tiers intéressés.

La ventilation de ce compte (073), telle que préconisée par le PCG-OCAM, est suffisante pour une réaffectation minimale et satisfaisante de son solde ; laquelle réaffectation repose sur l'hypothèse simple selon laquelle tous les frais immobilisés ou transférés consistaient en l'achat de biens ou de services marchands.

## 2.2. Consommation intermédiaire

Cette hypothèse conduit à une très légère sous-évaluation des consommations intermédiaires lorsque certains des frais en question sont des paiements d'impôts et taxes. Mais, en l'absence d'une ventilation plus fine de ces éléments, il n'est pas possible de procéder autrement.

En cas de distinction des achats de biens et des achats de services à l'intérieur du poste des consommations intermédiaires, on reprécisera cette hypothèse en réduisant les frais supportés aux seuls achats de services.

Une autre différence entre le PCG-OCAM et le SCN mérite d'être relevée au niveau de la consommation intermédiaire. Elle concerne les services d'assurance-dommages.

Le comptable national doit, pour calculer la consommation intermédiaire de service d'assurance-dommages (CIAS), disposer des grandeurs suivantes :

- Au niveau de l'ensemble des compagnies d'assurances résidentes

R1 = provisions pour risques en cours, à l'ouverture de la période

R2 = provisions pour risques en cours, à la clôture de la période

S1 = provisions pour sinistres, à payer, à l'ouverture de la période

S2 = provisions pour sinistres, à payer, à la clôture de la période

PE = primes émises, nettes d'annulations, réductions ou retenues

IP = Indemnités payées

- Au niveau des entreprises non financières

PV = primes brutes versées par les entreprises non financières.  
Il s'agit des primes d'assurance IARD enregistrées dans le compte 64/064 des charges et pertes diverses.

La production de services d'assurance-dommages (PAD) des compagnies d'assurance, définie égale à la différence entre le montant des primes dues  $PE - (R2 - R1)$  et celui des indemnités dues  $IP + (S2 - S1)$ , est une consommation intermédiaire des branches productrices et une consommation finale des ménages. L'affectation de ces consommations aux assurés doit être faite statistiquement proportionnellement aux montants des primes brutes versées.

La part des sociétés et quasi-sociétés non financières est donc égale à  $\frac{PV}{PE} \times PAD$ , soit  $PV \times \frac{PAD}{PE}$

Si une hypothèse de constance ou d'évolution constante du rapport  $\frac{PAD}{PE}$  (coefficient par lequel il faut multiplier PV) pouvait être prise, une valeur approchée de CIAS serait déterminée, même si PAD et PE ne sont pas encore connus.

N.B. : L'excédent des primes brutes versées par les entreprises sur leur consommation de services d'assurance-dommages constitue les "primes nettes d'assurances-dommages" du compte de revenu et dépenses.

### 2.3. Consommation de Capital Fixe (CCF)

Pour estimer la consommation de capital fixe, les méthodes statistiques préconisées et qui nécessitent pour le moins la connaissance des caractéristiques : année d'acquisition, durée de vie probable des biens d'actif utilisés par les entreprises, ainsi que les prix courants du marché des biens durables analogues, sont certainement les meilleures qu'il convienne de retenir. Des études particulières, menées tant sur la comptabilisation du patrimoine des entreprises que sur ses amortissements économiques, permettraient d'apprécier la mesure dans laquelle il faudrait corriger les amortissements fiscaux, pour obtenir une estimation satisfaisante de la consommation de capital fixe. Les comptes nationaux gagneraient certainement à effectuer des enquêtes statistiques sur cet aspect dont on comprend l'importance puisqu'il concerne par ailleurs la comptabilité patrimoniale.

Pour l'heure, faisant contre mauvaise fortune bon coeur, le comptable national sait se contenter des dotations aux amortissements comme mesure approchée de la consommation de capital fixe. Il s'appuie, pour adopter cette approximation, sur le fait que pour les comptes privés "les amortissements permettent la constatation comptable de la perte subie sur la valeur d'actif des immobilisations qui se déprécient avec le temps, et sont destinés à reconstituer les capitaux investis".

Si la perte subie se rapportait à la valeur des immobilisations, aux prix courants du marché, des biens d'actifs analogues, alors la définition retenue par les comptes privés serait presque identique à celle des comptes nationaux. En d'autres termes, il faudrait supposer que sur toute leur durée de vie, les immobilisations sont utilisées selon le même rythme annuel et pour les mêmes fonctions, pour admettre enfin que leur amortissement réel est égal à l'amortissement linéaire corrigé par l'indice des prix considérés, calculé sur la période pendant laquelle ils ont déjà servi.

Mais si l'amortissement fiscal est linéaire, il est, hélas, calculé sur une durée de vie qui correspond à l'espérance de vie, à la date d'achat des immobilisations. Cela conduit bien souvent, sauf cas d'obsolescence ou d'accident, à une surévaluation des pertes annuelles subies que l'on constate à la fin de la période d'amortissement fiscal ou au moment d'une vente effectuée avant ce terme. L'immobilisation pouvant encore être utilisée, son prix de cession est fixé à un niveau supérieur à sa valeur comptable résiduelle.

Que faire ?

Tenir compte des plus ou moins values sur cessions d'éléments d'actifs.

La méthode préconisée à cet égard par les auteurs du guide d'élaboration des comptes économiques (1) présente les inconvénients suivants :

- Elle rapproche des valeurs relatives à des années différentes : la plus ou moins value, en tant que différence entre le prix de cession et la valeur nette comptable, est une somme algébrique de valeurs, aux prix de l'année d'acquisition (valeur d'acquisition de l'immobilisation considérée), aux prix des années d'amortissement et aux prix de l'année de vente.
- La plus ou moins value totale corrige un excès ou un défaut des amortissements pratiqués sur plusieurs exercices et non sur le seul pour lequel les comptes nationaux sont construits et pour lequel on étudie les comptabilités des entreprises. La rapporter à ce seul exercice risque de surévaluer ou de sous évaluer la CCF correspondante. Il convient aussi de noter que certaines années, une entreprise peut ne pas réaliser de plus ou moins value, soit parce qu'aucune immobilisation n'aura été vendue, soit parce que la somme algébrique des plus et moins values sera nulle ; cela ne signifie nullement que les dotations aux amortissements correspondent assez bien (ou exactement) à la CCF.
- La plus ou moins-value réalisée ne porte, au maximum, que sur une partie des immobilisations pour lesquelles des dotations aux amortissements ont été calculées, au cours de l'exercice considéré. Elle ne corrige donc pas les amortissements des autres immobilisations.

Plutôt que d'utiliser cette méthode qui pourtant a l'avantage, le seul peut-être, de n'exiger que des résultats comptables disponibles dans le tableau des flux et soldes caractéristiques de gestion, l'on pourra procéder comme suit :

- A la fin de chaque année, demander aux Chefs d'Entreprises, ou à un échantillon aléatoire, d'adjoindre aux tableaux d'immobilisations et d'amortissements une feuille supplémentaire sur laquelle sera indiqué pour chaque immobilisation, le temps pendant lequel elle pourrait encore fonctionner et le prix approximatif auquel on le vendait si la nécessité en était reconnue immédiatement
- ti désignant à la fin du ième exercices, le temps pendant lequel une immobilisation pourrait encore fonctionner dans ou hors de l'entreprise, dans l'hypothèse d'une utilisation normale, l'amortissement économique  $A_i$  de cet exercice, et la valeur résiduelle  $V_i$  à la fin de cet exercice seraient estimés comme suit :

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(1) Guide d'élaboration des comptes économiques dans les pays en voie de développement. Tome 1 Méthodologie - Ministère (Français) de la Coopération et du Développement 1981.

$$A_i = v_o \frac{(t_o - 1)}{t_o} \cdot \frac{(t_1 - 1)}{t_1} \cdot \dots \cdot \frac{(t_{i-1} - 1)}{t_{i-1}} \cdot \frac{1}{t_i}$$

$$V_i = v_o \frac{(t_o - 1)}{t_o} \cdot \frac{(t_1 - 1)}{t_1} \cdot \dots \cdot \frac{(t_{i-1} - 1)}{t_{i-1}} \cdot \frac{(t_i - 1)}{t_i}$$

$t_o$  désigne la durée de l'amortissement fiscal

$v_o$  désigne la valeur d'acquisition de l'immobilisation

Mieux,

Au stade où se trouve la comptabilité nationale dans la plupart des pays Africains, on escamotera le débat sur la consommation de Capital fixe en dégageant des soldes bruts ; l'excédent brut d'exploitation serait calculé dans les comptes de production en tant que somme implicite de l'excédent net d'exploitation et de la consommation de capital fixe, l'épargne serait évaluée brute aussi.

### III - COMPTE DE REVENU ET DE DEPENSES

#### 3.1. Revenu prélevé par les entrepreneurs de quasi-sociétés.

Le revenu prélevé par les entrepreneurs de quasi-sociétés est, comme l'intitulé l'indique si clairement, la part du résultat ou des résultats net(s) de la période ou des périodes précédente(s) prélevée par les propriétaires des quasi-sociétés. Il est donc évident que cette opération est un emploi des quasi-sociétés dont la contrepartie est une ressource des propriétaires.

Les comptes de revenu et de dépenses s'ils devaient être établis pour des quasi-sociétés d'une part et pour les sociétés d'autre part, comporteraient dans un cas : le poste 4.4. (emplois) mais pas le poste 4.5, et dans l'autre cas, le poste 4.5. (ressources) s'il existe des sociétés propriétaires de quasi-sociétés, mais pas le poste 4.4.

##### a) en emplois

Le poste 4.4. : Revenu prélevé par les entrepreneurs de quasi-sociétés, est par définition constitué par les "sommes effectivement versées aux propriétaires, qui sont prélevées à cet effet sur l'excédent d'exploitation et le revenu net de la propriété ... (1)" et par les fonds considérés comme prélèvements négatifs que "les propriétaires de quasi-sociétés peuvent apporter ... pour compenser un revenu de l'entreprise ou un revenu net négatifs" (2). Le revenu net ainsi explicité correspond aux résultats nets des périodes précédentes des comptes 875 du PCG-OCAM.

(1) voir S.C.N. page 130 ; chapitre 7.43

(2) voir S.C.V. page 131 ; chapitre 7.45



Donc

4.4. = Variation externe (somme algébrique de la diminution et de l'augmentation externes) des comptes 875 du PCG-OCAM.

b) en ressources

Les choses sont plus délicates car la comptabilité privée ne fait pas apparaître ce genre de ressources. Pour contourner la difficulté il serait judicieux :

- de recenser toutes les quasi-sociétés financières et non financières
- de ranger à part toutes celles qui appartiennent à des sociétés non financières : il s'agit conformément à la définition que le S.C.N. (page 82) donne des quasi-sociétés, "des institutions et associations sans but lucratif essentiellement au service des entreprises financières et contrôlées par elles en tout ou en partie" et qui sont organisées sur le plan de la comptabilité ;
- de déterminer la valeur totale du poste 4.4. de ces institutions et associations
- de l'affecter aux sociétés non financières, en tant que 4.5.Revenu prélevé par les entrepreneurs de quasi- sociétés (en ressources)

Cette démarche est logique et fidèle aux prescriptions du SCN (1)(2)

3.2. Prestations sociales directes des employeurs

Généralement, la détermination des prestations sociales directes des employeurs et de leur contrepartie dans le compte de production des sociétés et quasi-sociétés, ne pose aucun problème. Nous ne l'évoquons ici que pour souligner l'adoption dans les Etats de l'UDEAC de la nomenclature des frais de personnel (NFP) qui distingue bien

- les rémunérations directes
- les cotisations sociales
- les indemnités sociales
- les avantages en nature
- les indemnités de fonction,

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- (1) La tentation serait grande de considérer la diminution externe du compte 875 comme constituant le poste 4.4., tandis que l'augmentation de ce même compte constituerait le poste 4.5. Mais il est clair, au vu des éléments que nous avons soulignés supra, que l'on devrait y résister, pour ne pas s'écarter tant de la logique des contreparties comptables que des règles énoncées par le SCN et qui reprennent cette logique.
- (2) La méthode peut-être aisément affinée et enrichie par la prise en compte des transferts de revenu de la propriété et de l'entreprise en provenance des quasi-sociétés du reste du monde, enregistrés dans la balance des paiements.

facilitant ainsi l'évaluation des prestations directes des employeurs.

Quelle que soit la règle utilisée en matière de traitement comptable des avantages en nature, on saura retrouver les sommes ou la somme totale correspondantes dans le compte 073 des frais à immobiliser ou à transférer ou dans les détails du compte 65-065 (frais de personnel). Ces avantages en nature ainsi que les indemnités de fonction constituent avec les rémunérations directes, les salaires et traitements bruts tels que définis par le S.C.N.

Les prestations sociales directes des employeurs, égales en valeur aux cotisations sociales imputées, sont constituées par les seules indemnités sociales.

#### IV - COMPTE DE CAPITAL ET DE FINANCEMENT

##### 4.1. Enregistrement des régies d'avances et accréditifs

La nomenclature du compte 58-058 des régies d'avances et d'accréditifs fixée par le PCG-OCAM ne comprend que

- les régies d'avances
- les accréditifs
- et les crédits documentaires

autant de comptes dont les soldes débiteurs ou nuls sont à reporter dans le compte de capital et de financement, en emplois dans les numéraires et dépôts (postes 8.2 et 8.3).

Ils ne peuvent en aucun cas être repris parmi les flux nets d'engagements (1), car le compte 58 du PCG-OCAM n'est pas un compte de passif.

##### 4.2. Traitement des avances et acomptes sur commandes d'immobilisations en cours

Le solde débiteur du compte 24 des avances et acomptes sur commandes d'immobilisations en cours doit être enregistré dans le poste 8.11 des crédits commerciaux et acomptes, et non parmi les prêts à long terme n.d.a. poste 0.8

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(1) Le "guide d'élaboration des comptes économiques dans les pays en voie de développement du Ministère (Français) de la Coopération et du Développement, préconise en sa page 187 l'insertion dans les ressources 9.11 - crédits commerciaux et acomptes, des avances et acomptes reçus (compte 58). Ceci est d'autant plus surprenant que le compte 58 ne concerne pas du tout des avances et acomptes reçus. Ces derniers sont comptabilisés en 41(clients) par les fournisseurs des biens et services commandés.

a) En ressources (1)

L'apport en capital des propriétaires dans les quasi-sociétés est enregistré par ces dernières dans le compte du mouvement capital (10). Il correspond donc à la variation externe de ce compte (somme algébrique de la diminution et de l'augmentation externe).

b) En emplois (1)

Ce flux n'apparaît pas de façon explicite dans la comptabilité générale des sociétés propriétaires. Pour estimer son montant on procédera exactement comme pour le revenu prélevé par les entrepreneurs de quasi-sociétés (voir § 2.1.b.) ; à savoir :

- recenser les quasi-sociétés (2)
- identifier les institutions et associations sans but lucratif essentiellement au service des entreprises non financières
- déterminer la valeur totale du poste 8.10 de ces quasi-sociétés
- l'affecter aux sociétés non financières, en tant que flux 9.10

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(1) Dans le compte de capital et de financement, les montants inscrits aux postes 8.10 et 9.10 ne sont pas égaux en principe car les quasi-sociétés non financières n'appartiennent pas toutes à des sociétés non financières.

(2) Voir dans la balance des paiements les transferts en provenance de l'étranger.

DISTINGUISHING BETWEEN TRADITIONAL AND MODERN ACTIVITIES  
IN THE NATIONAL ACCOUNTS OF DEVELOPING COUNTRIES

by Harry SCHIMMLER

Note : The paper was originally produced for the Development Centre of The Organisation for Economic Co-operation and Development. Part II (i.e. the second part of section 2, on proxy criteria by industries, section 3, framework of tables and section 4, the country reports) has not been included here. The original study can be obtained from the OECD Development Centre.

OBJECTIVES OF THE STUDY

Contrary to expectations, the dichotomy "modern" and "traditional" has continued to exist in most developing economies. It used to be thought that the major difference between the two was that they were situated in a different dynamism ; it was assumed that the modern part was more dynamic and that either it would outgrow and eventually absorb the other or at least its growth would spread across the remainder of the economy. It is now realised that this development is not materialising; the two parts have a separate though not independent existence with each following different determinants while containing similar elements. It is also realised that for the purposes of economic policy the two parts should be analysed separately providing they can be defined clearly enough so that the data permitting such an analysis can be made available. In this study an attempt is made to define a clear distinction between the traditional and modern parts (or sectors) of a developing economy and to suggest practical criteria on the basis of which a developing country could introduce this distinction into its national accounts.

The rationale for formulating a definition of the traditional and modern sectors for the objectives of economic analysis is provided by the lack of any general understanding about the two sectors. Even though many authors make statements about economic relationships between a "modern sector" and a "traditional sector" there is no standard definition according to which data for these sectors can be established ; the terms "modern" and "traditional" when employed by different authors implicitly

cover divergent underlying facts and are used interchangeably with other terms such as "monetary" and "non-monetary" or "formal" and "informal". Even so, "traditional" is often considered as referring to all activities which continue to be carried out as before. But it is not clear the extent to which any modernisation or use of recent inventions, such as telephones, mechanical cash registers or small electric tools, change an economic unit so that it can no longer be regarded as "traditional". Similarly "modern" is primarily understood to mean "non-traditional" and in developing countries is invariably identified with any manufacturing activity, any large scale operation, any use of machinery, or any kind of institutionalisation, which did not exist before a certain period. Again the borderline is not clear ; for instance what is the size which constitutes "large" or what is the starting point of "manufacturing".

#### SECTORS AND CRITERIA

To assist clarification the study proposes a division of the two basic sectors into four sectors : fully traditional semi-traditional, semi-modern and fully modern. Such a division shifts the emphasis towards a production classification and away from a simple bipolarisation. "Traditional" becomes merely a term reserved for certain types of production processes and thereby attains a status on equal footing with the other three terms. Thus value judgements linked with the term no longer arise and any other judgements will relate only to the economic relationships of the four sectors. The study also proposes for each of the four sectors two subcategories : one for high labour intensity the other for low labour intensity. Although it is not the aim to actually create these subcategories they need to be discussed because "productivity" or simply the distinction between "labour-intensive" and "capital-intensive" is sometimes suggested as a criterion for distinguishing between kinds of activities. For this reason labour input is described as a possible third criterion after organisation and technology.

Of the last two criteria mentioned the study considers that organisation yields more distinct categories than technology which constitutes only a secondary criterion. However neither can be measured in the usual empirical way ; both require definitions of certain qualitative aspects that can be distinguished by entities for which statistical information is readily available. For this reason the distinction between the sectors will have to be made by production units or their outputs, often using proxies whose validity will require testing in borderline cases. Nevertheless the theoretical criteria need to be examined so as to highlight that which the proxies should approximate. This is done in part I of the original paper, which is reproduced here.

The immediate objective of the study is to propose operational criteria for distinguishing by their modes of production four sectors of traditional and modern activities. However

available data do not usually correspond to theoretically based criteria because observations have not been made according to these criteria. Thus at the ex-post stage empirically based criteria have to be used as proxies. Here the question is whether the proxies facilitate the division of available data into the same sectors as those defined by the theoretically based criteria ; this they must do if the resulting distinction between traditional and modern activities is to be valid.

The study should be seen more as a discussion of guidelines that can be followed so that actual data can be derived. The situation in relation to the availability of data and corresponding proxies for the division into sectors varies among developing countries. However the basic principles outlined should make it possible to elaborate or simply find corresponding proxy indicators for a useful distinction of the sectors in most developing economies.

## I - DUALISM

### 1.1. Introductory Discussion

To be of use to economic and social policies data have to be structured in ways that best help policy makers pursue their objectives. Until recently it was thought that the elements making up a developing economy were sufficiently uniform for the economy to be treated as a whole and data have tended to be observed accordingly. It has now been recognised that these elements are less uniform, differing substantially in their development and requiring separate consideration. One of the consequences of this realisation has been the re-emergence of a number of "dualisms" in development economics. The main characteristic of such dualisms is the belief that two parts of an economy display systematic differences in their economic and social behaviour over time. Examples of dualistic categories are :

- traditional-modern, distinguishing producing units, that is transactors ;
- non-monetary-monetary, distinguishing transactions ;
- rural-urban, a socio-economic distinction ;
- informal-formal, an economic administrative distinction ;
- poor-rich, a recent category distinguishing incomes by distribution.

Common usage employs all the categories listed to refer more or less to the same socio-economic classifications. This is probably because when compared in pairs the area of overlap between two sets of categories is often considerable, although this correspondence usually disappears when a third category is introduced into the comparison. In fact each category breaks down the underlying total by different aspects so that practically none of them can serve to represent another. Nonetheless there are areas in which categories obviously overlap as well as areas in which the overlap is less apparent or where categories are just different combinations of the same aspects (1). But before considering the implications of specific dualisms, the general character of dualism needs to be discussed.

"Dualism" is the term used to describe the existence of elements in developing economies which have not been integrated into a single economic system or which have emerged as two separate parts in the course of their development. The mere existence of two parts that are different is not a sufficient condition for a dualism ; it is also necessary for these parts to have a systematically different development. It used to be thought that dualistic categories arose as an intermediate stage of development and that in the long run either the two categories would again merge into some average state or that one of the categories would eventually set the place for both. In the event of either happening there would no longer be a dualistic state even though in the latter case the two categories would continue to exist. But neither has happened ; dualisms in developing countries are growing in importance and more attention is now being paid to their various forms and to the question of their measurement (2).

Measurement is required not only to observe the dualism as such but to follow as well the consequences of increasing dualism. Also once the recognition of a dualism has given rise to policy actions measurement is necessary to monitor their effects. Currently the measurement of dualistic categories is very incomplete ; only a partial and simplistic view of their existence can be obtained from available statistics. Since it is now recognised that dualisms constitute a major problem to developing countries, a number of studies have been started particularly in connection with the informal-formal dualism and some of them include measurement efforts. However despite the fact that dualistic categories are being considered in various contexts, conceptual issues have not been raised and dualistic categories have still to be defined in a way that enables direct quantification.

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(1) See schema 1 on page.

(2) See /6/ /14/ /15/ /16/ /22/ and /27/.

Although certain specific studies have adopted particular working definitions according to their aims and the observed circumstances, there has been no general conceptual solution that defines a dualism so that both the two categories and the total are described. Even the present study does not define separately the sum of the dualism it is concerned with. The study is based on existing national accounts data and totals ; these totals do not include such categories as traditional, rural and informal in their entirety and this will bias the apparent relationships between the categories when these are separated. Yet even though the relative magnitudes of the categories can only be roughly estimated, measuring the magnitude of dualistic variables is still desirable because of their increasing relevance to planning.

Current national accounts already contain a large number of the elements that have to be elaborated for the type of analysis envisaged. However a distinction should be drawn between direct and indirect elements. Direct elements are those which are open for immediate observation such as movements between areas or between activities, prices in markets, imports and exports, credits and financial flows. Indirect elements are data derived from the direct observations and which facilitate comparisons of entities such as inputs, outputs , implicit prices movements and structural shifts in aggregates ; such comparisons are one of the primary objectives of organising data by dualistic categories. Indirect elements cannot be calculated without first having the corresponding direct elements and these will not become available until operational criteria have been defined. The present study proposes for the first time such criteria for the modern and traditional sectors.

### 1.2. Why the Modern-Traditional Distinction

As stated already there is a significant degree of overlap among the different dualisms ; any part of one dualism can be shown to comprise different degrees of other dualisms. The modern-traditional distinction is the most comprehensive of these dualisms or at least the one which can be used to sub-categorise other dualisms. In other words the traditional-modern dualism represents the largest common denominator and once the four sectors, if not the eight subcategories, described by the basic criteria of this study have been established, there may be less need for additional information on other dualisms.

Recent development models (1) are based on the observation that employment sectors which are obviously modern are not developing in line with the labour force so that either traditional sectors have to absorb more labour or unemployment increases. The same models also describe a pattern of growth

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(1) For example in /12/



where output per worker grows faster in the modern sectors than in the traditional sectors so that the increasing dualism in the structure of production is accompanied by increasing income disparities between sectors. Since policies are being based on these models, data are urgently needed to substantiate the assumptions underlying them. Providing operational criteria have been defined, much of these data will be supplied by first including in the usual macro-economic framework a disaggregation into modern and traditional sectors. Additional disaggregations, such as the "urban traditional" or "informal" sector, can be introduced afterwards, but these extra qualifications will not substantially modify the basic analysis of growing dualism and inequality.

Concrete data are needed on inputs, particularly on inputs of labour and capital which should be distinguished by category so as to provide insights into the actual uses and requirements of each category. Employment and unemployment trends should also be analysed by category since each category follows its own process and the determinants of these processes can only be singled out when the elements of each category are adequately known. Both, technology content and labour intensity are indicators of employment requirements and absorption. Planning employment programmes needs such information and in an economy where the use of technology and labour is not uniform, a distinction has to be drawn in the data that corresponds to its diverse parts. In developing economies these parts are more readily identified with the traditional-modern categories, the basic criteria for which are their relative labour organisation and technology inputs.

The modern-traditional distinction is the most measurable of the dualisms initially. In principle it is easier to define transactors than transactions and then to allocate all transactions of such transactors to the respective sectors. The traditional-modern distinction entails an institutional division of decision-making units. The division of such units, which are producing units as well, enables the separation of practically all production data into sectors according to the criteria used. Also with such an institutional division it is easier to classify such data as employment data the same way ; this greatly expedites the derivation of data required for intersectoral comparisons.

One of the principal objectives of separating data by dualistic categories can be seen in the comparative analyses it facilitates ; another major interest is in establishing the various relationships and interdependences between the categories and with the "rest of the world". The collection of information by institutional producing units allows the integration of data required for both these objectives. The procedure is largely identical for the determination and measurement of most dualisms and consists of a reclassification of primary data according to basic criteria. In practice it is usually not possible to effect these reclassifications on primary data using basic criteria. Most of the data that are available have been compiled by other

classifications ; reclassifications of observations are either too expensive and time consuming or just impossible at a later stage. Estimates based on proxy criteria have to be used instead. As will be seen later the traditional-modern dualism lends itself fairly well to the use of such proxies. (cf. Part II).

To summarise, the traditional-modern distinction is the one which :

- will satisfy the more urgent requirements of policy makers and model builders and, by establishing the subcategories proposed in the study, will cover aspects of other dualisms as well ;
- more data can be made available for, since direct links with existing data are easier to establish and the various analyses to be served by the data are easier to integrate.

This does not mean that other dualistic divisions are not important ; other dualisms can certainly be justified in the context of the objectives for which they are better suited. But they do not have the immediate implementation advantages of the traditional-modern category whose framework can be elaborated to accomodate them.

### 1.3. Terms Encountered in the Literature

#### 1.3.1. Traditional and modern

In an increasing number of cases the terms "traditional" and "modern" are being used to indicate two different sectors in the economies of developing countries. In a few instances the precise content of the sectors has been outlined but usually they are not defined, the two terms being employed with an implied underlying meaning. Generally it can be assumed from their use that they refer to a number of criteria which classify activities according to mode of production. Classifying production units by their modes of production represents a classification by transactors.

Sometimes "traditional" is used synonymously with "historical", "old fashioned" or "backward", with "modern" corresponding to "recent", "modernised" or "advanced" (1). A division into "old" and "new" requires a definite date as a dividing line between the two categories. Although modes of production can be distinguished by dates, this is not the distinction that is

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(1) See /22/ p. 62.

usually sought. Nevertheless such a distinction would produce definite results ; it is operational and could be useful for historical separations of planning periods. But in this case there would be old activities which apply modes of production similar to those in the modern sector as well as new activities applying traditional modes of production.

Others (1) have assumed the difference between the two sectors lies in there being more or less independent parts of the economy catering for different markets, where the modern sector comprises those products that are marketed either as inputs for industrial enterprises or as exports. For others (2) the modern sector is distinguished merely by the fact that the activities are recorded or at least they are open to such recording, that is the enterprise is designated as such and can be reached either by mail or by telephone. But again in both cases neither criterion is likely to produce sectors with modes of production that are homogeneous.

The present United Nations System of National Accounts (SNA) (3) is practically the only source where criteria for the modern and traditional sectors are mentioned explicitly. But at the same time they are such a mixture that no single clear definition emerges. As a first criterion "traditional" is given as an antonym of "more recent". Other criteria indicated are : "the resources, facilities and technology used in the activities, the manner in which production is organised or managed, and the scale of the operations" ; but they are given without any precise qualitative or quantitative definitions. Among the proxies suggested as suitable dividing lines between the two modes of production are : the distinction between the "institutional sector for corporate and quasi-corporate enterprises on the one hand, and for households including non-financial private incorporate enterprises on the other" ; the use of power equipment of two horsepower or less since this "indicates a lack of capital equipment and a reliance on hand labour" ; and the "engagement of less than five persons". But the applicability and adequacy of these criteria are questionable ; they can only be categories would overlap, being very heterogeneous.

#### 1.3.2. Non-monetary and monetary

This category makes a distinction between transactions rather than between transactors. It corresponds essentially to

(1) See /8/ pp. 1,2 ; /20/ pp. 6,7 ; /7/ pp. 184,185 ;  
/23/ p. 131.

(2) See /32/ p. 9 ; /5/ p. 80 ; /1/p. 369.

(3) See /30/ paras. 9.5 to 9.17.

a subsistence sector and a non-subsistence sector with the latter often being called "monetary". The subsistence sector basically encompasses production for own use, that is the output is not exchanged in a market. The sector is mainly non-monetary but could in principle include certain quasi-market elements, such as exchanges of basic foodstuffs or mutual services between households, and even minor monetary transactions. "Subsistence" is usually equated with the supply of (non-monetary and monetary) basic needs ; "non-monetary" includes non-monetary subsistence transactions as well as other non-monetary transactions like income in kind or own-account capital formation by modern enterprises. But even where output is non-monetary, it does not necessarily imply that there is no exchange of money during the production process as far as inputs are concerned (1).

How much of the non-monetary sector should be registered in the national accounts is not at all clear. It is not so precisely described in the SNA as to enable application in a straightforward manner by developing countries. This is mainly due to the fact that the model for this system of accounts was the normal structure of an economy in the industrialised countries ; households were taken as being merely consuming units and transactions were assumed to be valued through the market. Yet most of the problems in connection with the registration of non-monetary transactions in the national accounts arise from the fact that these assumptions do not apply universally ; the application of these assumptions leads to an incomplete registration and incorrect presentation of non-monetary transactions and their values.

Because of such deficiencies in national accounts data some authors recommend that non-market activities should be completely excluded, particularly the imputations made to improve their coverage of such activities (2). The incomplete registration of non-monetary output means "that the national accounts provide only a partial picture of the country's total resources and the uses to which they are put. In addition if the accounts are confined to monetary transactions, there is a danger that growth of the economy will be overstated (when) ..... formerly unexchanged output enters the monetary sector" (3). This problem concerns not only developing countries but also industrialised countries such as when housewives' activities (4) or other household activities of underemployed family members are replaced by market activities, or when the pendulum swings back and market services begin to disappear into unregistered own-account activities.

(1) See /3/ p. 9.

(2) For example Barkay in /2/.

(3) See /4/ p. 408.

(4) See the estimates of the level of housewives' services in the United States and their decline from 1929 to 1965 in /19/ .

Any framework that aims to show dualistic categories separately, particularly those explicitly covering the traditional, subsistence or informal sectors, will have to go to great lengths (1) to register the many different non-monetary transactions and their values. All economic transactions should be registered irrespective of their occurrence in households or elsewhere and independently of whether they are actually valued in market terms or not. This should be accompanied by valuing all actual activities by comparable, if necessarily conventional, averages of corresponding (market) transactions values.

### 1.3.3. Informal and formal

The ILO Report on Kenya introduced the term "informal sector" (2). It embodied a fairly wide coverage while being restricted to an "urban subsector". The report considered that "informal activities are the way of doing things, characterised by ease of entry, reliance on indigenous resources, family ownership of enterprises, small scale of operation, labour-intensive and adapted technology, skills acquired outside the formal school system, and unregulated and competitive markets". Sometimes the sector is also described as "modern", partly because "urban" in general is thought to be such and partly because there are many quasi-manufacturing activities in the urban informal sector that would be called "modern" if all manufacturing were to be called "modern". However such a perspective excludes any wider definition of the informal sector which is often considered to comprise traditional activities rather than just quasi-modern activities. Other authors have seen the informal sector as consisting of the "unregistered" economic agents which for developing economies "may well correspond to the household sector" (3). The term "unorganised" is also used in reference to the fact that the economic agents in this sector normally have no regular bookkeeping and no proper institutional organisation (4).

Thus as Seers (5) sees it, the informal sector is "the activities of small-scale labour-intensive manufacturing enterprises, all the small workshops of artisans, including tailors, furniture-makers, etc., who constitute the 'informal' or 'marginal' segment of this sector. These are also small-scale operators in construction, transport, sometimes mining, distribution, medicine, education and of course agriculture (the

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(1) As described in /26/ p. 15.

(2) See /15/p. 6, although in /28/ Sethuraman mentions that the term was first used by Keith Hart in a study on Ghana.

(3) See /9/ p. 35.

(4) For Example /31/pp. 20, 21 ; /7/ pp. 182-187.

(5) In /26/ pp. 18-20

peasantry)." Seers goes on to point out that "recent research has made it increasingly clear that these 'informal' activities not merely account in toto for a large fraction of the output of marketed goods and services, but that they also constitute a key element in each sector and in the national economy (and indeed also in its political structure). It is impossible to understand the working of the labour market, or to devise an employment strategy, unless one grasps the dynamics of the relationship between 'informal' and 'formal' economies which are linked through subcontractors, agents and those providing personal services".

Seers puts forward a solution which from several viewpoints is very attractive. Having described the informal sector for which data for all industries should be established along with the formal sector (with the latter being broken down into foreign, state and private enterprises), he goes on to propose a distinct account for the informal economy as a whole in which are included all activities, legal or otherwise, which are work-like and yield a revenue similar to income. A further justification for keeping the informal sector separate is that its values have to be estimated much in the same way as they are for the subsistence sector. However the subsistence sector does not usually cut across the dividing line between modern and traditional ; the informal sector does.

#### I.3.4. Other terms

In addition to the three dealt with already, there are other dualistic divisions such as "small-large", "labour intensive-capital intensive", "low productivity-high productivity", "rural-urban" and "poor-rich". Except for the first three pairs which constitute possible proxies for the demarcation between traditional and modern, the remaining two pairs are less homogeneous. Rural-urban is primarily a socio-geographical distinction(1). Urban areas combine both non-monetary and monetary transactions as well as activities in the informal and formal sectors. The same holds for the distinction by income distribution proposed by some authors(2). The category "poor" cannot be identified with one sector, it is closely interlinked with the traditional, the subsistence and the informal sectors ; it also cuts across these sectors (3). Moreover neither the rural-urban nor the poor-rich division is by itself sufficient to enable the required separation of data by organisation, technology or labour content.

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(1) Although in /18/ Kelley et al use "rural" and "urban" almost synonymously with "agricultural" and "industrial".

(2) For example /21/ p. 447 ; /7/ p. 184 ; /23/ pp. 130, 133-134 ; /26/ p. 13.

(3) See /24/ p. 137.

#### 1.3.4.1. "rural-urban" (socio-geographical distinction)

This pair is the most heterogeneous with respect to a division into a modern and a traditional category, because both parts include elements of each of two categories(1), however these are defined. In addition, the criterion in this case is a regional distribution, which by definition cuts across all other criteria. A primary distinction between rural and urban data would almost automatically require that these data should be further subdivided by other criteria. Since, as will be seen below, the rural-urban distinction in many respects does not coincide with any other distinction, not even nearly, it can hardly be taken as a proxy for either of them.

Urban areas are the agglomeration of practically all industries and trades, from the smallest to the largest unit of most of them, except for a few industries where only remnants in the outskirts of the cities exist (e.g. for agriculture). For the same reason, urban areas combine also non-monetary and monetary activities, as well as activities in the formal and informal sectors.

If, however, special interpretation is required to apply the rural-urban distinction only in a certain sense or restricted to certain data, as it was also mentioned in connection with monetary, then the criterion loses part of its meaning and thus of its operationality, and the results will lead to misunderstandings. It is therefore not obvious in which respect "urban" could be equated with "modern", unless the content of "modern" takes the same wide content as "urban", in particular, if "modern" is only seen as "recent"(2).

#### 1.3.4.2. "small-large" (distinction by size)

This criterion is frequently adduced for a distinction between traditional and modern activities. In fact, to a large extent, a certain correspondence can be observed between large and modern, and between small and traditional, the problem is however, that this is not generally true. Nevertheless, when the correspondence can be established, these proxy criteria are most useful, because they are directly operational, since many statistics yield data by size.

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(1) Cf. Also the graphical illustration on p. .

(2) e.g. Kelley, Wilkinson, and Cheetham /18/ , distinguish between "rural" and "urban" almost synonymously with "agricultural" and "industrial".

### B. Problèmes d'estimation :

Sous une forme simple, le modèle s'écrit :

$$X = Y a + u \quad Eu = 0 \quad Vu = I$$

On reconnaît ici un cas où les moindres carrés sur le modèle empilé sont équivalents aux moindres carrés équation par équation.

Mais il apparaît très vite, comme c'est habituel sur les données individuelles, que l'on a à traiter un problème d'hétéroscédasticité. Ainsi nous corrigeons les données individuelles de chaque entreprise par un facteur

$$\lambda_k = \sum_j y_j^k.$$

Chaque input et chaque output est alors réduit par  $\sqrt{\lambda_k}$  avec  $\lambda_k$  représentant le total du compte d'exploitation ou le total du chiffre d'affaires. Soit  $\Lambda$  la matrice diagonale (K, K) dont le terme diagonal est  $\lambda_k$ .

Les estimateurs des coefficients techniques sont alors :

$$\hat{a}_i = (Y' \Lambda^{-1} Y)^{-1} Y' \Lambda^{-1} x_i$$

pour un input i donné, et, en juxtaposant et transposant chacune de ces équations :

$$(7) \quad \hat{A} = X' \Lambda^{-1} Y (Y' \Lambda^{-1} Y)^{-1}$$

formule dans laquelle on reconnaît les coefficients entrées-sorties habituels et qui donnent en colonnes la structure des coûts de la branche y compris le compte d'exploitation par branche.

Trois types de problèmes surgissent habituellement :

- la variation de stocks et erreurs sur les variables explicatives : des erreurs dans les réponses des entreprises sur leurs ventes, le non-prise en compte dans ces ventes de productions intégrées, et enfin le traitement adopté pour les variations de stocks de produits finis ou de travaux en cours, peuvent introduire des erreurs sur les variables explicatives.

- contraintes a priori sur les coefficients : autre défaut de la méthode, son caractère aveugle quand le statisticien a de bonnes raisons de penser qu'un coefficient technique doit prendre une valeur déterminée (par simple bon sens ou utilisation d'autres sources statistiques).

- les coefficients négatifs : même quand le modèle est spécifié au mieux, les calculs donnent souvent des résultats négatifs pour certaines entrées (en fait le plus souvent non significatifs). Pour ces trois problèmes, il n'y a pas de solution générale aisément applicable. C'est typiquement le cas où le statisticien doit intervenir sur les données mêmes, qui restent par chance en quantité raisonnable dans le cas du Cameroun. Le plus souvent, les problèmes tiennent à une excessive diversification des entreprises ou à leurs intégrations verticales. On rencontre rarement ces deux types de structures industrielles dans une économie en développement (le plus souvent pour les cultures d'exportation). La correction des données doit être faite au niveau de l'établissement.



rempli, cas très fréquent, on procède avec ces travaux pour compte propre comme avec le non ventilé en output ; ceci revient, on l'a vu, à leur imputer, il est vrai assez arbitrairement, la structure d'exploitation moyenne de l'entreprise.

Le Plan Comptable prévoit avec le poste "frais à immobiliser" la possibilité pour une entreprise d'amortir sur plusieurs exercices certaines charges d'exploitation exceptionnelles, et ce pour ne pas fausser arbitrairement la structure du bilan. Ainsi en va-t-il, disons, pour des frais salariaux supportés à l'occasion d'une mission d'experts étrangers venus installer tel équipement. La charge est enregistrée classiquement en frais de personnel ; mais l'entreprise peut décider d'"immobiliser ces frais", c'est-à-dire d'en annuler la charge en passant, de la façon habituelle, une dotation aux amortissements.

Ainsi, quand les frais à immobiliser sont clairement identifiables comme dans l'exemple ci-dessus, on décidera de supprimer cet "output" à la fois des ressources et du poste approprié des emplois. Pour ne pas gonfler artificiellement les dotations aux amortissements par cette procédure, on réaffectera la part correspondante à l'immobilisation passé dans le poste ~~approprié~~ approprié (frais de personnel dans l'exemple ci-dessus).

Cette procédure permet d'éliminer aisément les avantages en nature au personnel et certaines taxes exceptionnelles. Dans les cas litigieux, ou quand la ventilation n'est pas faite, on considère là encore ces frais à immobiliser comme du non-ventilé.

#### 4. Egalité des inputs et des outputs

Si en général le compte d'exploitation est équilibré, il s'en faut de beaucoup que cet équilibre soit préservé quand on remplace la donnée de synthèse par le total du tableau qui analyse le poste comptable correspondant. L'égalité est alors rétablie selon le principe suivant : si la somme des inputs du tableau d'analyse est inférieure à la donnée de synthèse du compte d'exploitation, le solde est mis dans le non-ventilé. Si au contraire, cette somme excède la donnée de synthèse, on procède à une contraction du tableau d'analyse pour rétablir l'équilibre.

A la fin de cette procédure, on obtient pour chaque entreprise deux vecteurs, l'un d'inputs, l'autre d'outputs et égaux en somme. Remarquons à nouveau que le vecteur d'inputs contient un poste, souvent non négligeable, de non-ventilé. Les deux matrices obtenues, l'une pour les inputs, l'autre pour les outputs, sont les matrices X et Y de la présentation théorique.

#### B. Le tableau d'échanges intersectoriels (TEIS) et le tableau des productions par secteurs (TPS)

Cette étape est immédiate dès que les données ont été ajustées pour chacune des entreprises. Mais elle est essentielle en ce qu'elle suggère un nombre appréciable de corrections à effectuer, et que les 2 tableaux livrés (TEIS et TPS) sont d'un intérêt certain pour l'analyse économique, et, comme tels, recommandés par le système de comptes nationaux des Nations-Unies.

L'idée est la suivante :

- on agrège chacun des vecteurs d'inputs selon le secteur d'activité de l'entreprise et on obtient le TEIS.

- on agrège les vecteurs d'outputs des entreprises selon leur secteur d'activité et on en tire le TPS.

Chaque entreprise est en effet repérée dans un fichier particulier par un code en 3 chiffres de la nomenclature CITI adaptée au Cameroun qui caractérise son activité productrice principale. L'obtention des deux tableaux est donc une simple agrégation du fichier obtenu au sortir de la première étape selon cette table d'activité.

Le premier tableau (TEIS) donne la structure des consommations intermédiaires et le compte d'exploitation par secteur. Ces résultats sont confrontés avec ceux qui sont issus d'une autre chaîne de traitement informatique de la comptabilité nationale, qui donne directement, à partir des DSF, les 4 comptes de secteurs recommandés par le système de Comptabilité Nationale (Production, Revenu et Dépenses, Capital et Financement), chaîne qui opère les ajustements et réévaluations automatiquement tant le détail comptable de la DSF est grand.

Le second tableau (TPS) donne une image très intéressante du degré de diversification des secteurs de l'économie. En adoptant une nomenclature appropriée d'inputs et d'outputs, la dispersion autour de la diagonale du haut d'un tel tableau, mesurable avec un critère unique, résume le degré de diversification de l'économie.

Ce tableau met également en relief les secteurs fortement dispersés dans plusieurs activités, activités pour lesquelles on peut s'attendre à des résultats moins bons en sortie du modèle économétrique. Dans une application ultérieure de la méthode, non encore réalisée au Cameroun, elle peut aider à poser certaines contraintes a priori sur les coefficients de branche.

Enfin, ce tableau permet d'obtenir des coefficients de ventilation de la production par secteur qui peuvent aider à obtenir les données de production par branche à partir d'une redistribution des données sectorielles.

### C. La dérivation économétrique du TES

Connaissant à l'issue de la première étape les matrices X et Y d'inputs et d'outputs par entreprises, il devient possible d'appliquer le modèle (2) et d'en tirer ainsi le sous-bloc du TES désigné précédemment par la matrice A. Le programme de résolution est un programme de calcul de la formule (7), tout à fait maîtrisable puisque la matrice  $Y'Y$  à inverser est de dimension 25 (1).

Il est à rappeler qu'on obtient par cette formule uniquement le cadre central du TES, à savoir l'aspect ressources du TES, et au sein de ces ressources, uniquement la ventilation de la production brute des branches.

On a donc choisi une méthode qui, compte tenu des remarques faites plus haut, laisse subsister des coefficients négatifs. Ces coefficients négatifs sont effacés par la suite grâce à une procédure itérative dans le calcul de matrice A.

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(1) Les premiers calculs faits au Cameroun sur les TES des années 1974 à 1977 n'ont pas pris en compte la correction de l'effet de taille (hétéroscasticité).

### 1. La procédure itérative :

La matrice A comporte une ligne "non ventilée" à la fois pour les inputs locaux et les inputs importés. L'idée à la base de la procédure itérative est de prendre ce non ventilé, et de le réaffecter selon une structure moyenne à déterminer dans l'ensemble de la branche ; puis, de prendre la matrice ainsi obtenue comme base de la réaffectation du non ventilé lors de l'itération suivante.

Précisément, on part d'une matrice A arbitraire (qui est en fait le TES de l'année précédente). On applique le modèle (7) sur les fichiers incluant le poste non ventilé, pour obtenir une matrice  $A_1$ . Le non ventilé est redistribué dans chaque branche selon la structuration définie par A. On obtient ainsi une matrice  $A'_1$  qui ne comporte plus de non ventilé. C'est cette dernière matrice qui remplace la matrice A. de l'itération précédente et qui servira donc à obtenir une matrice  $A'_2$  lors de l'itération en cours.

Les coefficients négatifs disparaissent, ce qui est la preuve de leur faible importance puisque le non ventilé ne représente qu'environ 4 % du total de la production de la branche. On peut juger avec raison qu'une telle méthode de ventilation accorde une place trop importante à la matrice entrée en paramètre au cours de l'itération. C'est vrai ; mais ceci permet d'introduire des considérations empiriques sur la plausibilité de certains coefficients et ainsi de bâtir le TES camerounais compte-tenu de l'expérience subjective de l'économie que peuvent avoir les comptables nationaux.

### 2. Le TES en valeur :

Disposant alors du TES en coefficients, dont la somme en colonne est égale à 1, la dérivation du TES en valeur est immédiate dès que l'on connaît les productions globales de chacune des branches. Dans le cadre de la confection des comptes nationaux 74/75 et 75/76, puis 76/77, la Direction de la Statistique de Yaoundé avait déjà fait de tels calculs, qui comportent une part consistante d'arbitrages et d'estimation. C'est avec ces chiffres que purent être publiés des TES en valeur qui, rappelons-le, ne concernent que le secteur moderne, et de plus que la partie ressources de ce qu'on entend généralement par TES.

La méthode peut certes donner d'autres renseignements pouvant aider à la complétion du tableau (taux de marge par produit, taux d'imposition douanière), mais cela n'a pas encore été utilisé au Cameroun.

### 3. Le problème des marges :

Il n'offre pas de difficulté dès que l'on considère, comme le veulent les systèmes de comptabilité nationale, les marges comme l'output d'une activité commerciale.

Mais on a souhaité, dans le TES camerounais, ventiler ces marges selon la nature de l'activité commerciale (exportateurs - principalement de produits du cru -, commerce de gros - il s'agit ici surtout d'importateurs -, et commerce de détail). La ventilation a été faite grâce aux renseignements tirés de la DSF d'une part sur la ventilation des ventes entre marché local et exportation, d'autre part sur la décomposition des achats entre achats locaux et achats importés. La ventilation par type de produits vendus n'a

donc pas servi dans l'application du modèle (7), mais uniquement dans une phase antérieure pour la détermination du taux de marge par branche.

#### 4. Les résultats :

Ils sont consignés dans les annexes ; y figurent les TES en coefficients et en valeur des années 1974/75 et 1975/76. On en retiendra que trois choses dans le cadre de cet exposé :

- d'une part, comme il a été vu plus haut, une certaine dispersion des inputs dans les branches où ils n'ont pas à intervenir. Mais cette dispersion n'est notable et n'est davantage qu'un bruit statistique que dans le cas des branches "exploitations forestières" et "bois-menuiseries".

- d'autre part, et d'une façon très frappante, une remarquable stabilité des coefficients d'une année sur l'autre. Ce résultat compense quelque peu l'absence de statistiques associées aux estimateurs.

- Enfin que certains éléments "en marge" du tableau, pour lesquels on dispose d'informations exogènes, sont assez bien estimés par la méthode. Le cas le plus notoire est celui des taxes à l'importation qu'on connaît grâce aux comptes du Trésor Public, et dont on sait que les DSF les expriment presque à 100 %.

#### 5. Utilisation de la méthode pour dériver les comptes d'exploitation par branche :

On peut être rebuté par la méthode en ce qu'elle suppose un excellent document statistique de base par entreprise pour pouvoir tirer le TES en coefficients. Mais l'absence d'un tel document n'interdit cependant pas l'usage de la méthode pour les comptes sur biens et services. En effet, si l'on ne dispose pas de statistiques de produits par entreprise, on détient toujours un compte d'exploitation de l'entreprise, par conséquent, une ventilation de sa valeur ajoutée.

La méthode peut se voir alors cantonner à l'obtention, selon la même logique, de compte d'exploitation par branche qui permet, si l'on connaît le chiffre d'affaires de chaque branche de reconstituer chacun des éléments de la valeur ajoutée et de disposer d'une donnée de calage pour les consommations intermédiaires de la branche.

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A N N E X E

BRANCHES DE L'ECONOMIE	AGRI. INDUST.	PECH. INDUST.	BOIS FORST.	FAINE	CACAO SUCRE	INDUS. ALIMENT.	BOISSON	TEXT. ET COTON	BOIS MEUBLES	PAPIER	INDUST. CHIMIE	SUBJ. LUMIERE
101. PUIS AGRICULT.	9	5,0	1,2	13,8	67,9	17,6	3	12,1	2	1,0	5,3	1
12 P. CLEV-PÊCHE	1	0	1,5	4	1	1,4		1,0		1	7	
13 GROUPE BOIS	9	0							13,0		7	
14 CHAPI FARIN	1,2				5	7,1	5,3			7	3	
15 CACAO SUCRE	3	6		5	11	3	2,2			1		
16 AUTRE ALIMENT	1	6		1	2	7					7,6	
17 BIEN BOISSON	1											
18 TEXT. COTON	1	2,6		1,1				3,0			1	
19 BOIS MEUBLES	8	2,8	1,3		1	3	5	1	3,2	1		4
20 PAPIER EMBAL.	3,4	6	1	4	1,0	5	1,8	2	2	16,4	1,1	
21 CHIMIE COTON	3,0	1	7		1	3	4	2,7	1,1	5	4,6	9
22 METAL DE BASL	3	5	3		3				7	1	6	18,3
23 OUVREAU METALL.	1,4	1,9	4,9	3	2	1,7	2,5	6	2,6	3	1,2	1,9
24 REPAR. AUTOM.	1,7	6,6	4,0	8	1,5	2,1	1,2	6	3,0	6	7	8
25 MINER. MATER.	1						7				4	1,1
26 ELECT. LAI-GAZ	1,2	3,1	7	8	1,3	2,3	2,5	5,9	2,4	9	1,8	8,4
27 MATERIEL T.P.	1				1							1
28 DIVERS NON VI	1											
29 TRANSPORT	4,9	4,3	14,2	3,8	2,5	2,4	4,8	2,5	6,6	2,1	1,2	1,9
30 AUXIL. TRANSP.	4	7	4,4	1	1	4	1	2	2,0	8	9	6
31 SERVICES	4,6	7,6	5,7	2,0	1,9	4,8	3,2	5,6	4,8	3,1	2,3	3,6
32 TRANS. MACHATS	5	9	6			7	8	7		2,7	1	3
33 SERVICE/ACHAT	4	2	1				1	1	1	1,3	1	1
TOT. INPUT LUC.	26,4	30,1	39,7	23,7	74,3	37,7	26,4	34,1	40,6	30,8	29,1	38,5
24 PTS AGRICULTES	1	1,9		5,7	1	1,1	1,1	11,1			10,1	
25 PTS ALIMENT.	3			5	2,9	5,3				2		
26 BIEN VIN CIG	1				2					1		
27 TEXTILE CUIR	1	2		1,9	1	1		8,6			1	
28 PAPIER ENGALL	4,5	4	1		1,4	4	5	6	3	19,7	1,6	1
29 PS PETROLIERS	2,6	16,3	8,6	2	5	2,4	2,5	2	5,8	2	6,5	6,8
30 PTS CHIMIE	5,2	4	3	1	1,1	1,2	1,7	6,3	2,7	4	13,4	2,0
31 METAUX MACHIN	1,9	1,8	2		1	2,6	2,6	6	2,5	1	3	12,0
32 PIECES DETACH	2	3	4,2	4	3	2	1	1		1	1,2	1,8
33 MINER. MATER.	1,0	1	2		1	1,3	1	1		1	4	10,2
34 TRAP. FRANGERS	9	7	8	5	1	1,5	2	1,1	4	1,6	3	8
TOT. INPUT IMP.	17,1	22,2	14,5	58,3	6,9	16,3	17,7	28,1	12,1	22,8	34,0	41,7
36 SAL. OUVRIERS	22,3	12,7	15,2	2,8	1,6	16,5	5,6	8,7	14,9	9,2	4,1	5,2
37 ADMIN. COMMER.	6,3	4,4	1,7	1,1	1,0	4,2	3,9	1,6	2,4	2,1	1,6	1
38 MATIK. CADRES	6,7	16,3	9,0	2,5	2,8	6,1	5,3	5,6	7,9	6,1	4,4	1,9
39 TEMPORAIRES	2,9	1,1	5	2	1	5	3	2	9	4	3	2
TOT. SALAIRES	38,2	34,2	26,4	6,6	5,5	27,3	14,2	16,1	26,1	17,8	10,4	7,4
40 TAXE LUIF AFF	1,2	1,5	1,3	1	6	2,3	1	2,2	1,9	4,9	1,5	2
41 T.O.U.T. I.P.	1	5	3	5,4	1	6	26,9	2,9	1,4	3,1	6,8	3
42 TAXE IMPORT.	1	1	1				3					
43 TAXE EXPORT.	2,0	6	5,4	7	4,5	1,1	2		8	2	1	
44 PRELVI CSTAR	3			1	1		1	1	1	1	1	
45 AUTRES TAXES	1	1,0	5,7	1	2	2	1,0	8	4,6	3,4	6	4
TOT. TAXES IND	3,7	3,7	12,8	6,4	5,4	4,2	20,4	5,9	8,8	11,7	9,1	9
46 CONST. TERRAIN	2,9	7	1,4	4	2	1,1	8	9	1,1	4	6	7
47 MAT. TRANSP.	3,7	4	6,4		1	1,4	4	1	2,9	4	1	1
48 MAJAL. LUMIERE	7	5,6	5,6			1,1	1	2,9	1,5	7	1	2,4
49 MACH. ALGERE	8	5	1,5	9	6	2,1	5,0	1,7	4,1	2,4	2,2	2,0
TOT. AMORTIS	8,1	7,2	14,9	1,3	1,1	5,7	6,3	5,6	9,6	3,9	3,0	5,2
50 REV. NET-EXPLT	6,5	-5,7	-8,3	3,7	2,8	8,8	7,0	9,6	2,6	13,0	14,4	6,3
TOTAL GENERAL	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

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# THE BALANCING AND RECONCILIATION OF INPUT OUTPUT TABLES

by W.I. MORRISON

## I. INTRODUCTION

The construction of a series of input-output tables in increasingly being seen as an integral part of the production of national accounts data, and the United Nations' system of national accounts (SNA) incorporates an input-output approach as a central component (United Nations Statistical Office, 1968). This paper examines some of the problems involved in constructing input-output tables in the context of the SNA, and in particular focuses on the fundamental questions of balancing and reconciliation.

A wide range of methods has been proposed for use in balancing and reconciling input-output tables. Some of these are specific to the input-output approach, whereas others consist of more general algorithms borrowed or adapted for input-output purposes. In this paper it is suggested that in circumstances where some survey data are available the initial emphasis should be placed on techniques which involve the removal of major statistical discrepancies by the further investigation of the basic data. More mathematical approaches are thought to be most appropriate for making final adjustments to the tables, for estimating tables where very few data exist, or in circumstances where the up-dating of a matrix is the prime subject of concern. It is shown that the more relevant of the mathematical approaches rely to a greater or lesser extent on the judgement of the analysts involved with a particular exercise, and so it is argued that these techniques should be seen as extensions to the detailed examination of the basic data rather than as an alternative approach.

The basis of the input-output calculations in the UN SNA is the input-output data system, which distinguishes between accounts on commodities and accounts on industries. The system consists of a number of accounting blocks, and the relationship between these blocks, and the overall structure of the system, can be simplified and shown in diagrammatic form (see Figure 1).

Figure 1 - The Input-Output Data in the SNA

	Commodities	Industries	Final buyers Net	Totals
Commodities		U	e	q
Industries	V			g
Value added		y'		$\eta$
Totals	a'	g'	$\eta$	

In this figure an upper case letter represents a matrix, a lower case letter a vector (with a prime superscript showing a row vector), and a Greek letter a scalar. Thus :

$U$  = Absorption of commodities as intermediate inputs by industries  
(dimension  $j \times k$ , where there are  $j$  commodities and  $k$  industries)

$e$  = Net final use of commodities (dimension  $j \times 1$ )

$q$  = Domestic output of commodities ( $j \times 1$ )

$V$  = Production of commodities by industries ( $k \times j$ )

$y'$  = Primary inputs (value added) of industries ( $1 \times k$ )

$\eta$  = Sum of value added in each industry : Sum of net final demand for each commodity

If we define the unit column vector  $i$  :

$$q = Ui + e \quad (1)$$

$$q = V'i \quad (2)$$

$$g = Vi \quad (3)$$

The matrix  $U$  is generally known as an absorption (or use) matrix, and the matrix  $V$  is generally called a make matrix. (The vectors  $e$  and  $y'$  may also be disaggregated and consist of matrices showing final demand of primary inputs.)

The arrangement of input-output data as recommended in the SNA is best seen as a long-term goal (McGilvray and Morrison, 1982). In many countries and particularly in developing countries, the data available will enable only part of the framework to be completed. Gaps in the data will thus have to be filled, and in addition inconsistencies in the data will have to be removed if the three arithmetic identities (equations 1-3) are to hold. Stated simply, the balancing and reconciliation of input-output tables involves the successful completion of these equations. The starting point of this paper is an assumption that some attempt has been made to construct the absorption and make matrices,  $U$  and  $V$ .

## 2. COMMODITY BALANCES

The UN SNA represents a compromise between the ultimate use of the framework as a base for economic model building, and the feasibility of assembling the component data. In order to minimise data problems and to simplify the survey work needed, the main focus is placed on obtaining data on the cost structure of industries (the  $U$  matrix) and the production of commodities by industries (the  $V$  matrix). It is felt that data on the intermediate and primary inputs which are used in the production of each commodity by each industry, and data on the intermediate and final uses to which the establishments of various industries send their products are not practical to collect (Aidenoff, 1970).

If the UN SNA approach is followed, in general there will thus be only one entry (if there is any entry) in each of the cells of the make and absorption matrices (1). The entries in the make matrix will be expressed in terms of producers' prices, and those in the absorption matrix will be shown in most instances in terms of purchasers' prices. The difference between the two sets of prices reflects, at least in theory, the margins - trade and transport - which are added to the producers' prices and which are incorporated in the price paid by the purchaser.

Recall equation (1) :

$$q = U_i + e \quad (1)$$

which indicates that the total output of any commodity contained in the vector  $q$  is equal to the total intermediate consumption of that commodity, together with final demand.

Equation (2) :

$$q = V'i \quad (2)$$

indicated that the total output of any commodity was equal to the sum over all industries of the commodity in question. Clearly, if the elements of  $U$  are expressed in purchasers' prices and the elements of  $V$  are in producers' prices, the right hand side of equation (1) will not equal the right hand side of equation (2). For this equality to hold, a vector of sectoral margins ( $g$ ) has either to be subtracted from the right hand side of equation (1) or added to the right hand side of equation (2), depending whether a balance is to be made in terms of producers' or purchasers' prices. This gives :

$$\begin{aligned} q^* &= U_i + e - g \\ &= V'i \end{aligned} \quad (4)$$

where the  $*$  superscript indicates producers' prices, and

$$\begin{aligned} q &= V'i + g \\ &= U_i + e \end{aligned} \quad (5)$$

which is the balance in purchasers' prices.

In most input-output exercises, especially in circumstances where only partial data are available, commodity balancing will initially involve an approach based on equation (4), since the absorption matrix,  $U$ , can only be expressed in terms of producers' prices if the relative proportion of the purchases of each commodity passing through the trade sector, the differential margins on these commodities and the transport margins on all commodity inputs are known. Such data rarely exist, even in countries with well-developed statistical services, and proportionality assumptions are inevitably made.

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(1) This means that much of the debate which has taken place on the balancing of regional input-output tables is only of limited relevance, since the literature is based on an assumption that in general each cell in the table will contain two entries, one relating to the reported sales and one related to the reported purchases of establishments in a sector. Reconciliation of these conflicting elements is thus the basic problem. For further details on this point see Jensen and McGaurr (1976 ; 1977), Gerking (1976a ; 1979a).

A further problem in moving towards the initial commodity balances concerns the treatment of imports. In the same way that it is difficult to estimate the proportion of commodity inputs into each industry which have passed through the trade sector, it is difficult to estimate the proportion which consists of imports. This is the case even when detailed survey returns are available, since many imported commodities are obtained from wholesalers or agents. The problem of distinguishing between domestic and imported commodities applies both to the elements of the absorption matrix and to final demand consumption, so that a further modification to the initial balance equation is needed, in the form of a vector of imports ( $m$ ). Thus equation (4) must be further modified to provide a base for the development of commodity balances :

$$q^* = U_i + e - g - m \quad (6)$$

Lal (1982) discusses the question of commodity balancing in the Canadian context, although his conclusions have general validity. He identifies three separate phases in the preparation of commodity balances. The first, and obvious one, is a system of classification for commodities. The second is to fill the gaps in the available data bases, and the third is to ensure that supply matches demand for each commodity. The classification system is extremely important, but even when international conventions have been adopted problems will still occur in practice. One set of problems concerns the need to link production data with trade statistics and the difficulties of mapping a data set based on the BTN (1) or the SITC (2) onto ISIC (3) data were referred to in another paper prepared for this conference (Morrison, 1982). But other problems concern the difficulties of allocating products to an appropriate sector, since this process often requires a very detailed knowledge of industrial technologies. The more disaggregation, the greater the problems. Experience would suggest that the commodities which are most difficult to allocate precisely are those in the chemical sectors, but metal products and food products (where there is overlap with agriculture) also pose problems for the analyst.

The second phase in commodity balancing - the completion of the data sets - requires the integration of a wide range of data of differing quality, and may involve ad hoc studies and additional surveys in order to complete the basic framework. Thus at this stage a preliminary estimate of margins might be made by allocating many of the initial discrepancies to the margins column, although clearly this can only be a first step and will always require subsequent verification. (It could even lead to margins which appear to be negative, so the procedure should not be adopted in a purely mechanical way).

The major part of the commodity balancing process involves the detailed examination of each of the rows identified in the analysis, in order to remove inconsistencies between the total supply and the total demand for each commodity. The words of Lal carry a message which will be only too familiar to anyone who has undertaken this exercise. "There are no ready-made

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(1) BTN : Brussels Trade Nomenclature.

(2) SITC : Standard International Trade Classification.

(3) ISIC : International Standard Industrial Classification.

statistical approaches to solving such imbalances. The only approach is laborious investigation ; one has to go back to the basic records to locate the sources of such imbalances" (Lal, 1982, p. 13).

But first, the distribution of demand will need to be looked at, to see if any obvious consuming sectors have been inadvertently omitted. All large values should be examined, to see if there has been over-estimation. The unique features of certain sectors will be noted, so that, for example, account can be taken of those rows with large numbers of small producers (such as bakeries or clothing), or those rows which export the majority of their output (for example, mining) or which sell to a small or a large number of other sectors.

When commodity balancing is undertaken a useful exercise is to make a distinction between sectors which are especially easy to identify or distinguish and all others. The former category will consist of sectors which contain only one or two key establishments, or which are especially important in terms of their contribution to export earnings. If these sectors contain few establishments balancing and checking is often easier, and so there are advantages to be gained in starting the balancing process with these "high profile" sectors, which then gives a base for subsequent analysis and balancing work.

Balancing is an iterative process, since any amendments introduced in one part of the data set have implications elsewhere. For example, increasing the demand for any commodity may mean that the supply of an industry's output may also have to be increased. This in turn may have further implications for other sectors in the economy, or for the margins in the sector. If output figures are changed, it may be necessary to change valued added, which in turn will influence GDP. But above all, any changes introduced must be consistent with the establishment level data available, and once these data have been checked they should be regarded as fixed. Obviously, there will be more scope to introduce changes if the available data only relate to a small proportion of the number of known establishments in a sector - but even here there are usually certain structural parameters which restrict the extent of the changes which can be made.

The process of commodity balancing forces the analyst to reconcile data at a series of levels, from the micro to the macro. Establishment data will have to be reconciled with aggregate trade statistics, data for different sectors will have to be matched, and the sum of all final demand, equal to the sum of all value added, will have to be related to estimates of gross domestic product at market prices and factor cost. This can pose further difficulties, particularly if survey-based work results in major revisions of GDP, or if data permitting the allocation of indirect taxes to individual sectors are unavailable.

It is not the intention of this paper to examine all the problems involved in constructing input-output tables, but in this discussion on balancing some mention must be made of secondary production. Whether an input-output table is balanced before or after secondary production is transferred - assuming that secondary production is to be transferred - is to some extent a matter for the analyst to decide. However, the methodology adopted, and the extent of secondary production, will have implications for the balancing process, and if an establishment level data base is to be maintained it will

generally be preferable to undertake the commodity balancing before the transfer of secondary production. This will enable the data for any defined sector to be related directly to a set of establishment records, and will thereby reduce the scope for introducing arbitrary modifications.

The balancing and reconciliation of input-output tables is thus a painstaking process involving the detailed investigation of micro data. It should not involve the use of a sector or a group of sectors as a sump to achieve an artificial balance. Equally, mechanical adjustment procedures will certainly produce a balanced table - but the table will be a display of assumptions and will be of no statistical value (Lal, 1982). Yet there do exist certain adjustment procedures which can be of value when input-output tables are being constructed, and it is to these that we now turn.

### 3.0. General approaches to balancing

There inevitably comes a time in an input-output study when the limits of the available data are reached, even though a global balance has not been achieved. Clearly, the fewer the data available, the sooner this point is reached, and even if a series of micro data sets is accessible the data may relate to different time periods, so that at the very least some deflation or inflation will be needed. In this way discrepancies can be introduced - discrepancies which cannot be removed through simple data examination. Alternative methods have thus to be adopted to obtain a balanced input-output table.

Three general approaches to the production of input-output tables can be identified. The first involves the judgement of the analyst, and can best be described as a pragmatic approach. The second, which may also involve the judgement of the analyst, requires the implementation of one of the methods available for solving what is generally known as the constrained matrix problem. The third, best described as a stochastic approach, relies rather more on statistical estimation procedures.

#### 3.1. The pragmatic approach

It is easy to criticise a pragmatic approach, on the grounds that it is subjective, that it is unscientific, that it requires too many arbitrary assumptions, and so on. Yet pragmatism has much to offer, especially if a team of people has been involved in the various stages of an input-output exercise over a period of time. In this way the analysts will have required a feel for the data, and an understanding of the economic structure of the spatial unit for which the input-output table is being constructed. Discussion and compromise can then make a major contribution.

Pragmatism has a major part to play in input-output exercises, and should not therefore be ruled out of order. What must be remembered, however, is that the construction of input-output tables should be seen as part of the wider and long-term planning process. Thus new data sets and revisions of old data will be available at various times, so enabling input-output tables to be up-dated. In this context, it is important to note that detailed records should be kept of all decisions made, so that earlier assumptions can be modified and improved upon as later data become available.



### 3.2. The constrained matrix approach

Methods available for solving the constrained matrix problem range from the purely mechanical to the highly subjective. The basic problem involves the production of an interaction matrix, given a certain amount of prior information which can be used to constrain the estimation procedure. The problem may be approached in two ways (Bacharach, 1970). One involves the specification of a simple form, which gives a solution matrix as a function of some given matrix. The other requires that the solution matrix be obtained by minimising a criterion (e.g. distance), subject to the specified constraints. Sometimes the two approaches can be regarded as identical.

A variety of mathematical methods have been used to solve the problem, but by far the best known technique is the RAS approach, which produces a balanced input-output matrix, given a base matrix and constraints on the row and column sums of the new matrix (for a full exposition, see Bacharach, 1970). Dissatisfaction with the mechanical nature of the row and column scaling process in the basic RAS model led Lecomber (1975) to argue for the inclusion of more information ("even that which is not fully reliable or appropriate"), and to suggest a generalised RAS approach which enabled individual elements to be constrained in addition to the row and column totals.

Other approaches to the solution of the constrained matrix problem have involved entropy maximisation techniques (Wilson, 1974), an additive model (Friedlander, 1961), linear programming (Matuszewski, Pitts and Sawyer, 1964) and the concept of information inaccuracy (Theil, 1967). But as pointed out by Morrison and Thumann (1980), a feature common to all these techniques is that they cannot incorporate additional linear constraints relating to subsets of elements in the new matrix, or qualitative information.

Morrison and Thumann (1980) demonstrated that an appropriate objective function could be developed, which permitted the estimation of a new input-output matrix as the solution of a constrained optimisation problem, and it was shown that linear solutions could be obtained and computed. In their formulation the new matrix elements are expressed as linear combinations of the base matrix elements, and the coefficients are determined by the constraints. Treatments of this kind have also been outlined by Stone (1961 ; 1970), Byron (1978) and van der Ploeg (1982), and a common feature is that all permit the inclusion of subjective data. Moreover, as shown by Hyman and Morrison (1980), the choice of the objective function can also determine the relative weight which is placed on the base matrix or the new matrix.

These methods should be regarded as further weapons to be included in the pragmatic armoury, so that the subjective component should be seen as a strength rather than a weakness. If there is a weakness of these methods it is that negative elements can appear in the new matrix, although experience to date would suggest that these can usually be removed with little difficulty by imposing non-negativity constraints and re-estimating.

Even this problem can be overcome if a quadratic programming formulation is adopted, and recent work by Harrigan and Buchanan (1982) has shown that such a formulation can also permit the introduction of upper and lower bounds to the constraints. This represents a further move towards the incorporation of a wide variety of data sources and subjective estimates in the

estimations procedure, and would appear to be an indicator of future developments in the field, since Harrigan and Buchanan, building on earlier work by Hildreth (1957) and Bachem and Korte (1978), demonstrate that computational capacity is no longer a constraint on the estimation procedure.

### 3.3. Stochastic approaches

The stochastic approach to the estimation of input-output data, as suggested by Gerking (1976b ; 1976c), is, strictly speaking, not relevant to the question of balancing, since much of the debate has concerned the most appropriate methodology for estimating coefficient data in individual columns of a table. The basic approach involves estimating the technical coefficients by cross-sectional analysis, based on the assumption that all firms in each sector have the same production function. The methodology has come in for some criticism, and modifications have been proposed by Brown and Giarratani (1979) and Hanseman and Gustafson (1981). It would seem that the approach has little to offer in sectors where the number of establishments is small, and even where the sample available is large, the basic assumptions appear to be somewhat daunting.

In an attempt to overcome some of the earlier criticisms, Gerking (1979a) extended the approach to include row, column and non-negativity constraints to the minimum variance reconciliation method adopted, although the methodology could well be difficult to implement for computational reasons if the number of sectors in the model is large. Interestingly, Gerking (1979a) also discusses ways in which a priori information of a qualitative nature can be included in the estimation procedure, but here too further empirical testing is needed.

### 4.0. Conclusions

The importance of the balancing stage in input-output studies cannot be over-emphasised, and the value of a reliable base matrix is all the greater when subsequent applications work is undertaken. Professional judgement has a major role to play in any balancing exercise, and of the mathematical approaches to balancing, those which permit the inclusion of additional information in the form of constraints on the estimation procedure have most to offer. Mechanical techniques, involving the proportionate allocation of differences over all sectors, have few attractions, and more recent stochastic approaches also appear to have little to contribute to the balancing stage (which is not to reject the use of this approach in different contexts - for example, in forecasting).

Finally, this paper has discussed approaches to balancing and reconciliation of input-output tables in those situations where some form of make and absorption matrices is available. There are often circumstances in which such matrices do not exist, even in rudimentary form, and here it is the constrained matrix approaches which also have most to offer, since these methods permit the inclusion of the maximum amount of available information in the estimation process. Equally, constrained matrix approaches have much relevance when additional input-output tables (for example, an imports matrix or a projected matrix) are being estimated. The construction of input-output tables is very much a long-term process. Bench-mark tables will be produced,

but there should also be regular revision of the data sets. In this process different methodologies and techniques will contribute at different stages, but practical solutions and professional judgement will always be required even in the most sophisticated model-building exercises.

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## MICRO DATA BASES AND THE PREPARATION OF NATIONAL ACCOUNTS

by W.I. MORRISON

### 1. INTRODUCTION

The development of micro-data bases from survey material in the context of national accounting studies cannot be regarded simply as a technical exercise. If maximum benefit is to be obtained from the introduction of computerised data processing and the associated advances in information technology which have accompanied the increased use of computers, then it may be necessary to introduce reforms of the administrative system at the same time. The extent of these reforms, which are essentially political in nature, will depend on the extent to which computer-based systems are introduced, and the precise nature of the reforms will be determined by the system of government in particular countries. But there will always be a need for some change, and this is one of the underlying assumptions of this paper.

The main focus of this contribution, however, is on the most appropriate methods of developing computer-based data files, and the need to construct national accounts statistics on a foundation of individual returns. The importance of long-term data planning is stressed, and it is suggested that the development of an integrated data system is possible even when financial and computational resources are limited. The paper is organised in three main sections. The first takes the United Nations System of National Accounts (SNA) (United Nations Statistical Office, 1968) as a starting point, and discusses some general principles of data management. The second examines micro-data bases in relation to the construction of a set of national accounts, and the third section looks at some of the practical problems involved in the implementation of micro-data bases.

### 2. DATA MANAGEMENT FOR PLANNING

Almost all developing countries attempt to control their patterns of economic growth through planning, and it is generally recognised that the increasing emphasis placed on questions of resource allocation and distribution requires an analytical capability which must necessarily be based on data of a quantitative nature (Pyatt and Roe, 1977). The implementation of the UN SNA, or a more general approach based on the use of a social accounting matrix (SAM), can be seen as responses to the twin problems of constructing a development planning model and an associated data base.

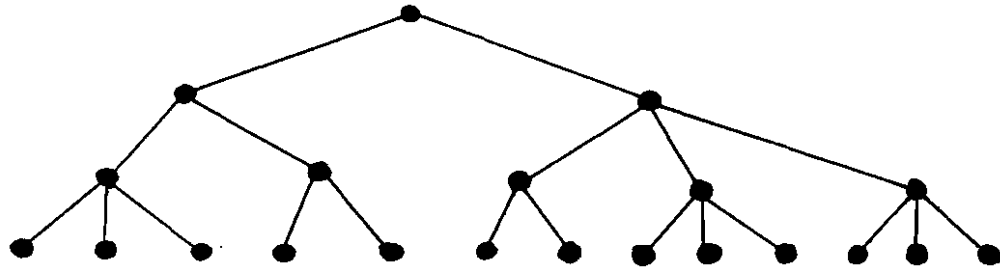
Data management can be classified into a number of categories, although the boundaries between the categories are not always discreet. Thomas (1971) identified five types. The first, routine data handling, involves the development of computer systems for accounting or payroll processing, or for the issuing of licences or permits, for example. The second, control systems, usually involves the development of self-contained systems such as those used to control traffic lights. The third, inquiry systems, sometimes uses the same data base as the first. Inquiry systems enable users to direct questions at a changing data base. The fourth system, the archival data

base, is a means of storing and retrieving historical data, much of which may be required only occasionally.

The fifth data management category identified by Thomas concerned data systems for planning purposes. These systems are as complex as the planning activities they are designed to serve, and commonly consist of statistical offices, whose principal function is to produce tables containing secondary data from primary data collected and assembled by the office. It is these systems that are the concern of this paper.

The key to the successful implementation of computer-based data systems in planning is the multiple-use of data. Traditionally, data management has frequently reflected a nested administrative structure, designed around specific tasks in the statistical office. This structure is based on a system of line management, organised in a hierarchical way, with lower levels supporting higher levels, as shown in Figure 1.

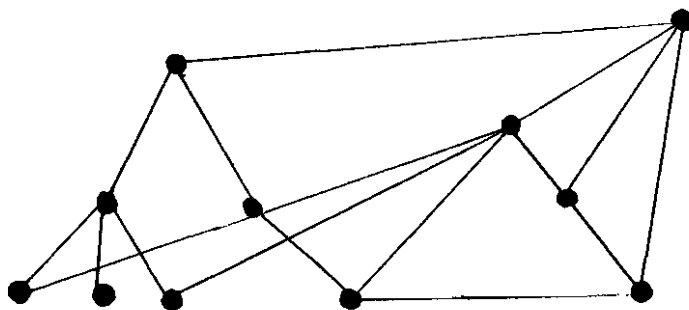
Figure 1. A nested hierarchy



Traditional administrative structures of this kind have sometimes been replicated even after the introduction of computers. Different lines of management were computerised separately, often at different times, so that the net result was often minimal in terms of efficiency, and communication between different administrative divisions had to take place through higher levels in the hierarchy. As the planning process became more complex, and as more demands were made for data, duplication of data collection became more common and the incompatibility of the formats and definitions used became more apparent.

It is clear that effective data management thus requires an alternative administrative structure which permits the multiple-use of data and crosses traditional dividing lines between administrative divisions. The system can be represented diagrammatically as a network structure, as in Figure 2, which shows a system with overlapping components which function at different levels in the hierarchy.

Figure 2. A network structure



However, even if the multiple-use of data, or at least of a significant proportion of the data, is made possible, the design principles needed to implement such a system should be based on an understanding of managerial as well as technical requirements. On the technical side, knowledge of the ways in which data can be stored and retrieved on different types and makes of computer, and the associated programming and software problems, is clearly needed. But whilst this technical knowledge is important, managerial ability is also required if the development of "data dumps" is to be avoided. More data do not always imply more information.

The data collected and stored must be related to the information needs of users and potential users. This requires a high-level understanding of the planning process, including the political objectives of that process, and the development of a data base which can respond to these objectives. The data base must be capable of linking multiple-use data with special-purpose data, and at the same time should permit the quantitative assessment of alternative policy options. A SAM or SNA approach fulfils these basic requirements, and the matrix form which underpins these approaches permits the generalization of the methodological capabilities of the accounting model (Dunn, 1974).

The view of Pyatt and Round (1977, p. 339) "that the underlying philosophy of the SNA and the SAM approach is thoroughly appropriate to statistical systems for developing countries" is to be strongly endorsed. Indeed, much criticism of these related approaches is misdirected, since it assumes that the aim is to develop an all-embracing model which is to be mechanically implemented and applied regardless of local circumstances.

If the SNA is seen as "a flexible and coherent framework which can accommodate the main bodies of data", in which "the user is left free to put his emphasis where he pleases and to leave some parts of the system completely aggregated while other parts are elaborated in detail" (Stone, 1977, p. xix) then any criticism must relate to the value of the SNA as an overall framework for analysis. Thus one of the principal reasons for the development of the more general SAM approach was a dissatisfaction with the treatment of the household sector as an aggregate in the SNA, although this development ought really to be seen as a point of detail rather than as a fundamental revision of the approach.

Development planning is a continuous process, and involves a series of cycles rather than a set of sequential stages (McGilvray and Morrison, 1982). Continuous revision and regular up-dating are needed - of goals and objectives, of the analytical models, and the data base. But planning cannot be delayed to await the arrival of a data base; it is necessary to work with what is available (Stone, 1981) and to work towards the longer-term improvement of the planning information system.

Such longer-term improvement should not, however, simply take the form of ad-hoc additions to the system, or be a response to the requirements of particular individuals. The adoption of an accounts-based approach ensures that an overall framework is available, and that some form of consistency

is maintained, so that extensions can be properly connected to the main body of data. In particular, the accounting approach enables many of the detailed transactions details to be temporarily left on one side and the global totals of the rows or columns to be related to other, perhaps non-recurrent or special purpose, data, which may not be part of the primary data base. The ability to undertake "side calculations" of this kind without losing sight of the basic framework is always welcome, and adds much to the analytical strength of the SNA or SAM approach.

What the adoption of an accounting approach permits is what Dunn (1974) describes as a matrix theory generalisation for data management. This enables data to be transformed from one pattern to another, and helps the user identify the most appropriate level for analysis. For example, the ability to combine data in different ways, and the ability to use different aggregations, are of vital importance to the planner undertaking a wide range of exercises which may range from project analysis to macro-economic studies of taxation.

Effective data management requires that flexibility be maintained in the designation of the component systems. A systems approach to planning involves the identification of the system of interest - the set of entities and the relationships between them. In an economic system the entities could be the industries or activities present, and the relationships could be expressed in terms of the flows of goods and services between these industries or activities. The entities, or elements, of a system are thus its component parts defined at the level of detail required.

Data management is thus much more than a technical-exercise, and there is no optimal representation of the component systems. Different systems are defined for different purposes and levels of analysis, and the definition of systems changes over time as the requirements of planning change, and as knowledge of real-world processes is increased. For each country there will be differences in emphasis. Some will focus more on agriculture, some on manufacturing. The significance of foreign trade will vary enormously, and the list could be much extended. In all cases, however, a strong argument can be made in favour of the adoption of an accounts-based approach to data management, built upon a matrix theory foundation which enables the representation of alternative systems to be easily and efficiently accomplished.

### 3. MICRO-DATA BASES AND NATIONAL ACCOUNTS

A micro-data base is a data base built up from individual reporting units. These reporting units may be industrial establishments, farmers, households, and so on; their distinguishing characteristic is that they possess certain descriptive attributes. Statistically, there may be little homogeneity within complete classes of reporting units, but for practical reasons such units are generally taken to represent an entity which can be regarded operationally, and which can be combined to form aggregate groups based on their descriptive attributes. Thus, in order to increase homogeneity, the general class of 'farms' may be sub-divided into classes of highland and lowland, or grassland and crops. Households may be urban and rural, rich and poor. The possible combinations are almost infinite.



Clearly, a balance has to be drawn between the principle of multiple data-use outlined in the previous section and the extent of data disaggregation. In general, moves towards highly disaggregated data represent moves towards special purpose data, although certain steps can be taken to ensure maximum multiple-use and flexibility.

Perhaps the most important of these steps is to ensure that the record for each of the reporting unit contains as many classificatory descriptors as possible. In practice many of the data elements for the reporting units can be used as descriptors, whether these elements represent continuous or discrete data categories. For example, industrial establishments could be grouped into size categories on the basis of total sales, if this was one of the data elements on the record. But in other cases it is necessary to employ standardised codes, and the use of such codes can be of great value in extending the scope of a data base and increasing the flexibility of the basic records (Dunn, 1974).

Many standardised codes are already widely used as a result of the work of the international agencies. Thus the International Standard Industrial Classification (ISIC), the Brussels Trade Nomenclature (BTN) and the Standard International Trade Classification (SITC) are well known. However, in practice these codes may not meet local requirements, and, in addition there are many other areas where no international agreement exists, and other areas (e.g. geographic location) where codes will always be country-specific.

Decisions on the standardised codes to be included in the records of reporting units in a micro-data base should reflect a compromise between accepted convention and the existing and potential needs of users of the data. Value judgements are thus always necessary, serving to emphasise once again that an understanding of the planning process is of major importance in designing computer-based systems.

The widespread use of standardised codes can certainly increase the flexibility of the basic records, but it can also lead to problems when a series of micro-data bases are being developed, or when a micro-data base is to be related to a more aggregate set of data. A one-to-one mapping of standardised codes may not always be possible. For example, it is frequently necessary to link trade data with production or consumption data, in which case a data set coded according to the BTN or the SITC may have to be mapped onto ISIC data. If the trade data are coded according to the BTN then they may first have to be classified according to the SITC, before being regrouped into ISIC sectors. But the commodity basis of the trade classification does not accord perfectly with the industry base of the ISIC, and local knowledge of the consuming or producing industries is necessary to ensure even a reasonably accurate mapping. The problem is that a "one-to-many" system is inoperable, unless additional instructions are given. On the other hand, many-to-one mappings are extremely useful, and form the basis of most aggregation or grouping schemes. Indeed, many-to-one mappings are likely to be far more common than one-to-one mappings, which require an array in the computer memory as large as the population to be mapped.

The use of standardised codes is also advisable when several micro-data sets are being developed, since these can often be linked through

a common descriptor. However, a note of caution is in order here. In order that micro-data sets can be properly linked, it is necessary to ensure that the data are drawn from the same component populations. The linking of micro-data sets is one of the fundamental problems facing the development planner. As the Ruggles (1975) indicated, there is rarely a complete absence of micro-data, and the basic task involves the reconciliation and integration of a large variety of different kinds of information at the micro-unit level. Thus an understanding of the qualities of the data - including the methods of collection - is inevitably required. Micro-data sets may have been collected at different times, from different samples or by different survey methods.

A partial solution to the problem is to have standardised identifying codes for the individual respondent units. Matching of data sets is then feasible where there is a relatively small number of respondent units in the data sets, if the same unit definitions have been used and the identifying codes can be matched. Where sampling techniques are adopted such matching is not possible, and when a complete census is undertaken the data search routines necessary to identify and match individual units may take an inordinate length of time.

A number of approaches to the integration and reconciliation of micro-data sets have been suggested. One of these was suggested by Dunn (1974) and involves the concept of master sampling. By this was meant the development of a master statistical frame, which includes identical or overlapping sets of respondents, which would be based on a system of unitary design and which would permit recurrent coverage of the demographic and economic characteristics of identical respondent unit panels. This would allow the characteristics of the sampled respondents to be matched with those of standard statistical data sets such as the population census. Dunn stressed the advantages of a master sampling approach, and particularly the value of the method in enabling experimental concepts or hypotheses to be tested.

The Ruggles (1975) discussed two further approaches to the reconciliation of micro-data sets. The first involved imputation of variables by use of multiple regression, an approach fraught with difficulties and considered most appropriate for reconciling small samples and imputing the value of a single variable. More attention was devoted to the technique of synthetic matching, an approach which involves comparing values of the matching variables in one data set to the values of the same matching variables in a second data set. This brings together similar observations from the two data sets, and the basic problem involves minimising a distance function between the values of all of the matching variables.

These are some of the general principles and problems which have to be remembered and faced when micro-data systems are being designed. Without such systems the quantitative analysis of the impact of different policies cannot be undertaken. However, micro-data need to be included as part of a more general framework in order that detailed questions on distributional effects can be answered. At any point in time the exact form of the macro-framework - be it based on the SNA or a SAM - will reflect a combination of perceived requirements and data availability. What is being emphasised here is that thought should always be given to longer-term requirements, and

even if these cannot be anticipated precisely, a high-level approach to the development of micro-data bases can facilitate the introduction of changes to the overall system and thereby extend the life of the computer software developed.

The construction of a micro-data base and an increase in analytical capability are thus very much interrelated. The implementation of a micro-data base also leads to major improvements in aggregate statistics. Data for national accounts purposes have always been derived from a variety of sources, and the reconciliation of these sources in a consistent way has been the principal task of the national accountant (Ruggles and Ruggles, 1975). Increasing the amount of data can thus increase the internal consistency of the accounts, and consequently their accuracy. But this should be seen as an incidental short-term benefit rather than a major long-term goal, since the most dramatic changes will be made in the early stages, and in the longer term there will be priorities in the planning process which are of more importance than the further refining of national income estimates.

The principal objective in developing an accounts-bases approach on micro-data will generally be the introduction of an analytical capability which will enable a series of policy questions to be answered, even if only partially. The target is thus the extension of a modelling capacity closely linked to the development planning process. The models will be constantly revised, in relation to changing requirements and changes in the nature of the data base. Few would claim that the SNA or a SAM approach have no weaknesses, but most would agree that they provide an appropriate framework for data organisation and a starting point for model-based analysis.

In preparing a set of national accounts by means of the SNA or a SAM, based on micro-data, there is one further advantage which requires emphasis. The examination and reconciliation of micro-data sets gives the analyst numerous insights into the patterns and problems present in an economy. There is a major element of learning-by-doing, which is impossible to quantify, but which can lead to considerable improvements in the formulation and specification of the analytical models constructed. Perhaps above all a real understanding of the details of the data can promote a degree of realism and pragmatism in the analyst which should ensure that the weaknesses of the models subsequently developed are better understood and lead to an acceptance of the need for continuous revision of the models and the data base.

#### 4. THE IMPLANTATION OF A MICRO-DATA BASE SYSTEM

In the first instance the implementation of a micro-data base will generally complicate the process by which the national accounts are produced. Irregularities will be revealed, scaled-up sample values may not tally with known population totals, and the introduction of flexible computer software may not be a straightforward operation. An extensive micro-data base system cannot be introduced overnight, and the development and survey work will continue over many years. No system will ever be fully comprehensive, and should not aim to be so.

The starting point for introducing a micro-data base system will be very much determined by the circumstances in a particular country. Statistical offices will have different priorities, and different schedules for

survey work. The availability and quality of existing data will vary between countries, as will the resources available. The micro-data bases to be implemented will also reflect local priorities and requirements. Given all this, it is still possible to suggest an appropriate target for the development of micro-data sets, at least in a general sense. Assuming that the national accounts are to be based on the SNA or a SAM approach, a viable goal would be the implementation of a micro-data base for each of the sectors identified in the accounts. This goal was also proposed by the Ruggles (1975) from a theoretical point of view, when they suggested that synthetic micro-data sets might be created for each sector, and that these data sets could be used as vehicles onto which new information can be mapped.

In practice, it should be possible to talk of five micro-data bases in the first instance, and these could be related to a programme of survey work which could be completed in a five year cycle (McGilvray and Morrison, 1982). The five data bases could relate to agriculture, mining and manufacturing (including utilities), construction, services, and households and tourists. Each of these would be capable of being disaggregated to conform with the precise sectoral definitions adopted in the implementation of the accounting framework. They could also be the subject of a major survey exercise, one of which might be completed in each year of the cycle. In addition, population census data and trade data would also be assembled.

One of the major problems in any accounting exercise is the determination of control totals for the component sectors. In many cases definitive lists of respondent units do not exist, even for the manufacturing sectors. Thus effort should be devoted to implementing a system which facilitates the measurement of sectoral aggregates and of providing definitive identifiers for responding units so that the subsequent sampling and up-dating of the information base are made easier. In the first instance a census should be the objective if no record of the operating units in each sector is available. This may imply a larger initial outlay of resources but should remove much uncertainty from the data analysis.

It has also been suggested that in the absence of any definitive sectoral data, the manufacturing sector is an appropriate sector to examine first (McGilvray and Morrison, 1982). This proposal was made for a variety of reasons. First, much development planning is concerned with the identification of new manufacturing projects. The establishment of a micro-data base on the existing stock of manufacturing industry can thus contribute much to analytical work on such topics as import substitution possibilities, level of technology or project appraisal. Second, the manufacturing sector, even if it is only small, is central to the economic system and has backward and forward linkages with most other intermediate sectors and final demand. Third, a census of manufacturing can be of value in estimating control totals for other sectors whose output is consumed by manufacturing or which consume manufacturing output. Fourth, data on manufacturing can often be combined with data on external trade, enabling a further series of consistency checks and analytical studies to be undertaken.

However, even where statistical priorities have already been determined, and the schedule of work excludes the immediate prospect of a manufacturing census, there are several guiding principles which should be borne in mind when implementing micro-data bases. Three of these relate to the

fundamental issue of questionnaire design. Many of the principles of good questionnaire design are too well known to merit further elaboration here, but there are some points related specifically to the creation of a micro-data base that are worthy of mention. One of these concerns the use of standardised descriptors, as discussed in the previous section. Standardised descriptors increase the flexibility of the system by permitting additional cross-tabulations and permutations of the basic data. The need to incorporate as many of these descriptors as possible is thus of great importance.

A second point related to questionnaire design also concerns the flexibility of the system. Data are needed to prepare the national accounts and to construct the matrices based on the SNA or a SAM approach. But the ability to undertake additional calculations is also important, so that the data collected in the questionnaire should not only be related to the formal construction of the accounting matrix. If surveys are being undertaken then thought should be given to the totality of the data required for planning purposes, and the relationship of the data from one sector to the total needs should be considered. Questions over and above those required for the accounting exercise ought to be incorporated, implying that consideration be given, even in the early stages of the development of a micro-data base, to the connections between different data sets and administrative implications of the process of data collection.

A third point on the subject of questionnaire design concerns the computer-based analysis of the data collected. In practice any well-designed questionnaire should be amenable to computer analysis if the accepted conventions have been followed, and there is no ambiguity or overlap in the questions. However, the way in which the data are to be coded requires careful thought.

What is of crucial importance in the implementation of any micro-data base is the attention given to cleaning and validating the questionnaire data. If the data at the level of the respondent units contain errors, then clearly any tabulations or analytical work based on the data set will contain these same errors. It is thus absolutely essential for the data to be checked at the basic level, and this constitutes one of the major operations to be undertaken. If errors are not identified in the early stages, they often become much harder to locate in subsequent operations.

Much data checking can itself be computerised, and errors in coding and data entry (whether through punched cards or direct) can usually be detected by introducing validation routines designed to undertake simple cross-tabulations or to compute totals and sub-totals at the respondent unit level. Other errors, some of which may well have been made by the respondents themselves, are more difficult to detect. Nevertheless, considerable progress can be made by a combination of computer-based analysis and visual inspection of the data.

For example, a series of indicators can be identified for each respondent unit. If the unit is a farm, one indicator might be livestock per unit area, and another might be vegetable production per family member. If the unit is a manufacturing establishment appropriate indicators might be value added per worker or the level of gross output. A combination of key

indicators, using absolute values and data in standardised form, can enable apparent anomalies to be quickly identified when means and standard deviations within groups of respondents are computed. Further inquiries can then be made to validate the responses, and although the overall process of data validation might be time-consuming, the time is well spent. Moreover, time spent on checking primary data is a further means by which the analyst develops an understanding of the system being studied, and an accurate primary data set enables accurate secondary tabulations to be produced. Some data modifications at the secondary stage will probably always be necessary, but the aim should be to keep these to a minimum.

## 5. CONCLUSIONS

Developments in the computing field in recent years have made the implementation of micro-data bases in the context of national accounting exercises a feasible option in most countries. Further progress, related particularly to more powerful micro-computers, will lead to additional cost savings and a widening of the areas in which applications can be made. The technological background is thus changing rapidly, but there has already been sufficient progress to permit the installation of quite complex systems on machines costing little more than many automobiles.

The implementation of micro-data bases is thus a practical proposition, although its precise contribution to the planning process will be determined by the decisions of individual countries. Already considerable progress is being made in this direction, linked to the use of SNA or SAM frameworks. This paper has emphasised the flexibility of these frameworks, and the advantages in basing them on micro-data systems. The aim has been to demonstrate the need to consider data as part of the overall planning process, linked to both the administrative and management procedures on the one hand and the political objectives of planning on the other. The micro-data systems introduced will vary from country to country, but the general principles outlined will still apply, and proper data management will be a major factor in the implementation of effective plans.

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## CONSTRUCTION OF INPUT OUTPUT TABLES AND SOME STRUCTURAL CHARACTERISTICS OF THE KENYAN ECONOMY

by K.L. SHARMA

### 1. INTRODUCTION

The present paper aims to highlight certain salient features of input-output tables of the Kenyan economy and summarises some aspects of the structural characteristics of the economy using the latest table of inter-industry transactions for the year 1976. The first section of this paper deals with the salient features and the second discusses the structural characteristics.

Work on the input-output tables (I-O tables) for Kenya was initiated in 1968 by the Central Bureau of Statistics Ministry of Economic Planning and Development, Government of Kenya with assistance from the Christian Michelson Institute, Bergen, Norway. Three sets of input-output tables for Kenya have been produced to date :

1. Input-Output Tables for Kenya, 1967 in 30 sectors.
2. Input-Output Tables for Kenya, 1971 in 30 sectors.
3. Input-Output Tables for Kenya, 1976 in 37 sectors.

### 2. SALIENT FEATURES OF THE INPUT-OUTPUT TABLES FOR KENYA

This section throws some light on the classification of sectors and the mode of compilation, the types of I-O tables, the treatment of imports, and the distributive margins,

#### 2.1. Classification of sectors and mode of compilation

Sectors for the I-O tables are classified according to the 4-digit level of the International Standard Classification but in some cases modifications are made as required by characteristics of the Kenyan economy.

The first two I-O tables, for 1967 and 1971, distinguish intersectoral transactions for 30 activities which are sub-divided into two broad categories : monetary and non-monetary. The monetary sectors consist of 27 specified sectors and 1 unspecified sector. The non-monetary sectors are aggregated into 2 specified sectors : (i) agriculture, fishing and forestry ; and (ii) water supply, building and ownership of huts. The distinction between these activities and the similar activities that occur in the monetary economy is that the output of each non-monetary sector is mainly consumed within the

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The author is highly benefited from discussions with Maurice Thorne in developing this paper.



sector, itself. No deliveries from non-monetary to monetary sectors are therefore shown. Labour cost and gross returns to capital are the payments for the main inputs of the non-monetary sectors. Also, some inputs of these sectors are purchased from the monetary sectors.

The number of sectors in the I-O table for the year 1976 has been increased from 30 to 37. Two important differences are made in this table. The producers of government services are divided into five different sectors. Also, the two non-monetary sectors have been replaced by a single traditional sector which consists of fishing, forestry, water supply, building and construction, and ownership of huts but does not include agriculture. All agricultural activities are now recorded in the agricultural sector of the monetary economy.

The 'open' system of recording intersectoral flows is such that final demands are distinguished from intermediate demands. The final demands are put under the 5 heads ; (i) private consumption, (ii) government consumption (iii) gross fixed capital formation, (iv) exports, and (v) changes in stocks.

## 2.2. Types of I-O tables

The I-O tables in Kenya are fairly detailed and comprehensive for making economic analysis. The intersectoral transactions are recorded at producers' and purchasers' prices. Also, there are separate tables for domestic transactions and total transactions, which include domestic and import transactions.

The I-O tables for 1976 contain 3 basic tables and 4 derived tables. The basic tables are : Table at Producers' Prices - Total Dimension, Table at Producer's Prices - Domestic/Import Dimension, and Table of End Use Analysis of Imports. Out of 4 derived tables, two are of technical coefficients - Technical Coefficients of Total Dimension, and Technical coefficients of Domestic/Import Dimension. The other two tables are of the Leontief inverses - Full Input Coefficients of Total Dimension, and Full Input Coefficients of Domestic/Import Dimension. The basic tables at producers' prices of total dimension provide the rows of indirect taxes and subsidies to arrive at market prices.

## 2.3. Treatment of imports

The I-O tables in Kenya give enough information on the use of imported goods by sectors of origin. The intersectoral transactions are recorded separately for domestically produced goods and imported goods. The basic table of end use analysis of imports divides the use of imports into 3 categories : intermediate use, gross fixed capital formation, and stocks. The use of imports in each category is sub-divided into c.i.f. value and duty paid.

## 2.4. Distributive margins

Interindustry tables can be constructed at producers' prices and at purchasers' prices. The difference between producers' prices and purchasers' prices comprises of transport charges ; traders costs such as warehousing,

insurance and traders margin ; and taxes. These changes combined together are known as distributive margins.

In Kenya, the I-O tables for the year 1967 is constructed at producers' prices. This table was initially compiled at purchasers' prices. In converting the intermediate matrix into producers' prices the marketing costs are transferred to the "distributive sector". The I-O table for the year 1971 is prepared both at producers' prices and purchasers' prices. Intersectoral flows at purchasers' prices are recorded inclusive of distribution charges. The distribution charges in the table prepared at producers' prices are treated as payments for services by the "trade and distribution" sector. The I-O table for the year 1976 is prepared at producers' prices. The flows are net of distribution charges which are included in the "trade and distribution" sector similar to the 1971 table.

Indirect taxes (excluding import duties) and subsidies for each sector are recorded in the quadrant of primary inputs in all three I-O tables for 1967, 1971 and 1976. The uses of primary inputs when adding indirect taxes less subsidies give gross value added at market prices. Sector-wise import duties are also recorded in a row under imports.

## 2.5. Concluding remarks

There has been a considerable improvement in compiling and preparing I-O tables in Kenya since 1967. The tables are fairly detailed and comprehensive in comparison to tables prepared in other developing countries at a similar stage of development. The estimates on intersectoral transactions are being improved in the light of better sources of data. The treatment of imports in these tables provides an opportunity to make detailed analysis of import-substitution.

Some points which can be taken into account while preparing I-O tables in the future :

1. Efforts should be made to prepare I-O tables in more disaggregation. The number of sectors should be disaggregated in order to study with great precision the production pattern, intersectoral linkages, and employment and income generation in individual sectors of the economy. For example in agriculture, there can be sectors like maize, wheat, rice, coffee, tea, cotton, etc.

2. Although to make an I-O table of the economy is a cumbersome process and involves many resources, the lag in preparing tables should be reduced. These tables can be updated at frequent intervals of at least 2-3 years in order to use them especially in development planning.

3. It is observed that operating surplus especially of the traditional and agricultural sectors has been included in profit, which is one of the rows of gross value added in I-O tables. In the informal and agricultural sectors, there is much labour whose wages should be estimated on the basis of opportunity cost. Family labour should be included in wages and salaries row instead of profit.

### 3. STRUCTURAL CHARACTERISTICS OF THE KENYAN ECONOMY .

An attempt is made in this section to study some structural characteristics of the Kenyan economy using the recent input-output table for the year 1976. This table of 37 sectors is aggregated into ten main sectors, namely, traditional sector ; agriculture ; mining and quarrying ; food processing, agro-based industries ; other manufacturing ; utilities, transport, and communication ; building and construction ; trade and distribution ; and other services. The sector-grouping scheme is given in Appendix 1. The systematic grouping of sectors broadly explains the structural aspects of the economy.

#### 3.1. Sectoral distribution of gross value added

Table 1 depicts sector-wise gross value added both at factor cost and at market prices. Value added at market prices includes depreciation, wages and salaries, profits, indirect taxes (excluding import duties), interest paid, and excludes subsidies. Value added at factor cost is equal to value added at market prices less indirect taxes. Moreover, the sectors have been ranked, in Table 1, on the basis of the magnitude of their contributions to the total gross value added of the economy.

Primary production activities, consisting of traditional sector, agriculture, and mining and quarrying, are seen to contribute 42.09 percent of the gross value added at factor cost and 39 percent of the gross value added at market prices. Manufacturing industries, which include food processing, agro-based industries, and other manufacturing, account for 11.56 percent and 16.60 percent of gross value added at factor cost and at market prices, respectively. Tertiary activities (Utilities, building and construction, trade and distribution, and other services) combined together account for 46.35 percent of gross value added at factor cost and 44.40 percent at market prices.

The ranking of the sectors reveals that maximum contribution is made by the agricultural sector alone (36.44 percent of gross value added at factor cost and 33.78 percent of gross value added at market prices). The second largest contribution of 26 to 27 percent is made by the other services. Next in order is the trade and distribution sector. The mining and quarrying sector makes the least contribution to gross value added. The ranking of these sectors is the same at factor cost and at market prices. The ranking of the other sectors differs (but not greatly) between factor cost and market prices.

#### 3.2. Cost composition of sectoral outputs

The two main components of gross output-cost of material inputs and services, and gross value added are shown in Table 2. For the economy as a whole, cost of material inputs and services accounts for 47.9 percent of output while gross value added with indirect taxes less subsidies contributes 52.1 percent to output.

For sectors where the cost of material inputs and services are low, the share of gross value added in gross output is high and vice versa. This is mostly true for primary production activities, like traditional and

Table 1

Sectoral Distribution of Gross Value Added - Kenyan Economy, 1976

Agregate sector	Gross value added			
	At factor cost		At market price	
	Million K ₤	Rank	Million K ₤	Rank
1. Traditional sector	69,81 (5.39)	5	69,81 (4.97)	7
2. Agriculture	472.29 (36.44)	1	474.70 (33.78)	1
3. Mining and quarrying	3.41 (0.26)	10	3.55 (0.25)	10
4. Food processing	53.38 (4.12)	7	95.87 (6.82)	4
5. Agro-based industries	39.00 (3.01)	9	51.84 (3.69)	8
6. Other manufacturing	57.43 (4.43)	6	85.61 (6.09)	5
7. Utilities, transport and communication	83.35 (6.43)	4	84.67 (6.03)	6
8. Building and construction	46.20 (3.56)	8	46.63 (3.32)	9
9. Trade and distribution	119.20 (9.20)	3	121.71 (8.66)	3
10. Other services	352.05 (27.16)	2	370.75 (26.39)	2
All activities	1296.12 (100.00)	-	1405.14 (100.00)	-

Figures in parentheses are percentage shares of sectors in total gross value added.

Source of primary data : Central Bureau of Statistics,  
Input-Output Tables for Kenya 1976, Nairobi : Government Printers, October 1976.

agricultural sectors, tertiary activities, like trade and distribution and other services. For example, in agriculture the cost of material input and services is very low (12.26 percent). The gross value added for this sector comes to 87.74 percent of gross output. On the contrary, for the sector of other manufacturing the cost of material inputs is very high (75.27 percent) and as a result the share of gross value added in gross output is low (24.73 percent).

### 3.3. Composition of demands of sectoral outputs

In Table 3 the total demands for outputs have been categorized under two main headings, namely, (a) intermediate demands and (b) final demands.

The intermediate uses of outputs are those which relate to flows of current inputs and services required to maintain the current production activity of the different sectors. These, obviously, exclude capital inputs.

The final demands are the outputs which directly go for final uses. These are sub-divided into five types, namely, private consumption, government consumption, gross capital formation, exports, and changes in stocks.

The private consumption and government consumption demands together constitute total consumption demand in the economy. Capital formation is gross and covers both private and public capital outlays. Exports can be visualized as demands for domestic outputs by foreign countries. Changes in stocks of outputs are shown as being held by the sectors producing such outputs.

From Table 3 it is clear that for agriculture intermediate demand account for 25.32 per cent of the aggregate demand, while 74.68 per cent comprises final demand of which 46.13 per cent is consumption, 25.56 per cent is exports, and the remaining 3 per cent is capital formation and addition to stocks of output. The traditional sector contributes 63.73 per cent of its total output for private consumption and 26.40 per cent for capital formation. For the mining and quarrying sector, the intermediate demand goes as high as 97.24 per cent.

The intermediate demand for manufacturing products (food processing, agro-based industries, and other manufacturing) ranges from 42 to 53 per cent, while for tertiary activities (excluding building and construction) it is from 33 to 44 per cent. The building and construction sector contributes 27.20 per cent of its output for intermediate uses and as much as 72.54 per cent for capital formation.

### 3.4. Composition of supplies of sectoral outputs

The two components of supplies, namely, (i) imports (c.i.f. value plus import duties), and (ii) domestic outputs with taxes other than import duties, have been presented in Table 4. For the economy as a whole, imports account for 15.75 per cent of total supplies while domestic production accounts for the rest. In agriculture, imports contribute about 2 per cent of total supplies. The share of imports in total supplies of the mining and quarrying sector is very large (90.29 per cent) and it is very small (0.61 per cent) in building and construction.

Table 2

Cost Composition of Value of Sectoral Outputs-Kenyan Economy, 1976  
(in Million K£ )

Aggregate Sector	Cost of material inputs and services	Gross value added	Gross output
1. Traditional sector	17.34 (19.90)	69.81 (80.10)	87.15 (100.00)
2. Agriculture	66.33 (12.26)	474.70 (87.74)	541.03 (100.00)
3. Mining and quarrying	8.59 (70.76)	3.55 (29.24)	12.14 (100.00)
4. Food processing	267.28 (73.60)	95.87 (26.40)	363.15 (100.00)
5. Agro-based industries	108.80 (67.73)	51.84 (32.27)	160.64 (100.00)
6. Other manufacturing	260.54 (75.27)	85.61 (24.73)	346.15 (100.00)
7. Utilities, transport and communication	152.96 (64.37)	84.67 (35.63)	237.63 (100.00)
8. Building and construction	116.02 (71.33)	46.63 (28.67)	162.65 (100.00)
9. Trade and distribution	57.20 (31.97)	121.71 (68.03)	178.91 (100.00)
10. Other services	236.69 (38.97)	370.75 (61.03)	607.44 (100.00)
All activities	1291.75 (47.90)	1405.14 (51.10)	2696.89 (100.00)

Figures in parentheses are percentage shares of cost of inputs and value added in gross output.

Source of primary data : Central Bureau of Statistics, Ibid., 1976.

For agro-based industries and other manufacturing sectors, the share of imports in total supplies is 25.69 and 36.68 per cent, respectively. In the case of the food processing industries, about 95 per cent of supplies are met by domestic production.

### 3.5. Contribution to gross domestic product per unit of final demand

There are a number of production sectors in the economy whose activities are interrelated. All sectors are viewed both as producers of outputs and users of inputs from other sectors. In this sub-section we intend to present the contribution to gross domestic product per unit of final demand of each sector by the sector itself and by other sectors.

In the open Leontief model, if the final demand vector  $F$  and the input-output coefficients matrix  $A$  are given, the equilibrium output vector  $X$  is computed as :

$$(1) \quad X = A^* F \quad \text{where } A^* = (I-A)^{-1}$$

Related to the equilibrium output relation, the value added relationship can be expressed as :

$$(2) \quad V = KA^*F$$

where  $V$  is the vector of gross value added and  $K$  is the diagonal matrix of the elements of value added-output coefficients. The value added per unit of final demand in each sector is :

$$(3) \quad V/F = KA^*$$

Equation (3) gives the total contribution, direct plus indirect, to value added (gross domestic product) per unit of final demand by various sectors. The value added-output coefficient of each sector is given in Appendix Table 2. The Leontief inverse  $(I-A)^{-1}$  is also presented in this appendix. The  $KA^*$  matrix is shown in Appendix Table 3. It is easy to see that sum of the elements of each column in  $KA^*$  matrix is equal to one since a unit worth of final demand in each sector has been considered.

In Table 5, the contribution to gross domestic product per unit of final demand of each sector is grouped into two categories : (i) contribution by the same sector, and (ii) the sum of contributions by other sectors. For example, in the agricultural sector 0.92 worth of gross domestic product per unit of final demand is contributed by the 'agriculture' sector itself, while 0.08 units are contributed by all other sectors. In manufacturing industries (food processing, agro-based industries, and other manufacturing) 0.35 to 0.50 units are contributed by the same sectors. The contribution of other sectors to the portion of gross domestic product from building and construction is as much as 67 per cent.

It is interesting to observe that the contribution by other sectors to gross domestic product is high when the particular sector depends primarily on other sectors for its inputs. On the other hand, if the dependence on other sectors for inputs is low, the contribution to gross domestic product by the sector itself to meet a unit worth of final demand of output of the same sector proves to be considerably large.

Table 3  
Composition of Demands of Sectoral Outputs - Kenyan Economy, 1976  
(in million K£ )

Aggregate sector	Intermedia- te demand	Final demands					Total Demand
		Private consump- tion	Govt. consump- tion	Capital formation	Exports	Changes in stocks	
1. Traditional Sector	8.60 (9.87)	55.55 (63.73)	-	23.01 (26.40)	-	-	87.16 (100.00)
2. Agriculture	139.86 (25.32)	254.84 (46.13)	-	5.25 (0.95)	141.18 (25.56)	11.29 (2.04)	552.42 (100.00)
3. Mining and quarrying	121.69 (97.24)	0.95 (0.76)	-	-	2.52 (2.01)	-0.02 (-0.01)	125.14 (100.00)
4. Food processing	164.58 (42.89)	183.09 (47.71)	-	-	33.15 (8.64)	2.90 (0.76)	383.72 (100.00)
5. Agro-based industries	108.12 (50.01)	91.95 (42.54)	-	2.86 (1.32)	18.26 (8.45)	-5.02 (-2.32)	216.17 (100.00)
6. Other manufacturing	288.18 (52.72)	88.42 (16.17)	-	91.88 (16.81)	83.99 (15.36)	-5.82 (-1.06)	546.65 (100.00)
7. Utilities, transport and communication	116.56 (44.34)	73.91 (28.11)	-	-	72.42 (29.45)	-	262.89 (100.00)
8. Building and cons- truction	44.52 (27.20)	-	-	118.71 (72.54)	-	0.42 (0.26)	163.65 (100.00)
9. Trade and distribution	68.22 (37.74)	53.18 (29.42)	-	9.33 (5.17)	49.95 (27.63)	0.08 (0.04)	180.76 (100.00)
10. Other services	231.42 (33.91)	107.79 (15.79)	253.79 (37.20)	39.38 (5.77)	50.08 (7.33)	-	682.46 (100.00)
All activities	1291.75 (40.35)	909.68 (28.42)	253.79 (7.93)	290.42 (9.07)	451.55 (14.11)	3.83 (0.12)	3201.02 (100.00)

Figures in parentheses are percentage shares of intermediate and final demands in total demand.

Sources of primary data : Central Bureau of Statistics, Ibid., 1976.



Table 4  
Composition of Supplies of Sectoral Outputs- Kenyan Economy, 1976  
(in million K£)

Aggregate sector	Imports (c.i.f. value with duties)	Domestic output with taxes	Aggregate supplies at market prices
1. Traditional sector	-	87.16 (100.00)	87.16 (100.00)
2. Agriculture	11.40 (2.06)	541.02 (97.94)	552.42 (100.00)
3. Mining and quarrying	112.99 (90.29)	12.15 (9.71)	125.14 (100.00)
4. Food processing	20.57 (5.36)	363.15 (94.64)	383.72 (100.00)
5. Agro-based industries	55.53 (25.69)	160.64 (74.31)	216.17 (100.00)
6. Other manufacturing	200.51 (36.68)	346.14 (63.32)	546.65 (100.00)
7. Utilities, transport and communication	25.26 (9.61)	237.63 (90.39)	262.89 (100.00)
8. Building and construction	1.00 (0.61)	162.65 (99.39)	163.65 (100.00)
9. Trade and distribution	1.85 (1.02)	178.91 (98.98)	180.76 (100.00)
10. Other services	75.02 (10.99)	607.44 (89.01)	682.46 (100.00)
All activities	504.13 (15.75)	2696.89 (84.25)	3201.02 (100.00)

Figures in parentheses are percentage shares of imports and domestic output in aggregate supplies.

Sources of primary data : Central Bureau of Statistics, *ibid.*, 1976.

Table 5  
Sectoral contribution to Gross Domestic product per Unit  
Worth of Final Demand- Kenyan Economy, 1976

Aggregate sector	The same sector	Other sectors	All sectors
1. Traditional sector	.8887	.1113	1.0000
2. Agriculture	.9212	.0788	1.0000
3. Mining and quarrying	.3743	.6257	1.0000
4. Food processing	.3534	.6466	1.0000
5. Agro-based industries	.4989	.5011	1.0000
6. Other manufacturing	.4002	.5998	1.0000
7. Utilities, transport and communication	.4902	.5098	1.0000
8. Building and construction	.3330	.6670	1.0000
9. Trade and distribution	.7032	.2968	1.0000
10. Other services	.7629	.2371	1.0000

Source : Calculated as explained in the text.

# Appendix 1

## Sector-Grouping Scheme

Traditional sector represents traditional economy (1).

Agricultural sector consists of agriculture (2) ; and fishing and forestry (3).

Mining and quarrying represents prospecting, mining and quarrying (4).

Food processing includes manufacturing of food preparations (5) ; manufacturing of bakery products, chocolates and sweets (6) ; and manufacturing of beverages and tobacco (7).

Agro-based industries consist of manufacturing of textile raw materials, rope and twine (8) ; manufacturing of finished textiles (9) ; manufacturing of garments, knitwear and made-up textiles (10) ; manufacturing of footwear, leather and fur products (11) ; manufacturing of wood products including furniture (12) ; manufacturing of paper and paper products, printing and publishing (13) ; manufacturing of rubber products (15).

Other manufacturing sector includes manufacturing of petroleum products (14) ; paints, detergent and soap (16) ; other chemicals (17) ; misc. non-metallic mineral products (18) ; and metal products, machinery and misc. (19)

Utilities, transport and communication sector is composed of electricity supply (21) ; water supply (22) ; transport and services allied to transport (25) ; and communication (26).

Building and construction represents building and construction (23).

Trade and distribution sector represents wholesale and retail trade (24).

Other services include building and repair of transport equipment (20) ; restaurant and hotel services (27) ; ownership of dwellings (28) ; financial services (29) ; misc. services (30) ; government services (31, 32, 33, 34, 35) ; ownership of business premises (36) ; and unspecified including hunting (37).

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\* Figures in parentheses are the sector number of Input-Output (I-O) Table of the Kenyan economy, 1976.

Appendix Table 2

Input-Output Coefficient (A) Matrix and the Leontief Inverse  $(I-A)^{-1}$  matrix Kenyan Economy, 1976

Aggregate Sector	1	2	3	4	5	6	7	8	9	10
A Matrix										
1. Traditional sector	.0987	-	-	-	-	-	-	-	-	-
2. Agriculture	.0156	.0393	-	.2897	.0265	.0192	-	-	-	.0018
3. Mining and quarrying	-	.0001	.0840	.0018	.0002	.3263	.0002	.0425	-	-
4. Food Processing	-	.0112	-	.2323	.0155	.0382	.0082	-	-	.0930
5. Agro-based industries	.0290	.0067	.0634	.0363	.3339	.0171	.0235	.0401	.0242	.0198
6. Other manufacturing	.0464	.0377	.2241	.0744	.1294	.2520	.1515	.3659	.0296	.0415
7. Utilities, transport and communication	-	.0037	.1129	.0204	.0217	.0202	.2400	.0252	.0810	.0325
8. Building and construction	-	-	.0239	.0033	.0044	.0080	.0004	.1187	-	.0332
9. Trade and distribution	.0093	.0159	.0329	.0456	.0565	.0297	.0236	.0468	.0162	.0105
10. Other services	-	.0080	.1664	0.322	.0892	.0420	.1963	.0741	.1687	.1574
Gross value added	.8010	.8774	.2924	.2640	.3227	.2473	.3563	.2867	.6803	.6103
$(I-A)^{-1}$ Matrix										
1. Traditional sector	1.1095	-	-	-	-	-	-	-	-	-
2. Agriculture	.0245	1.0499	.0392	.4114	.0757	.0720	.0362	.0419	.0166	.0562
3. Mining and quarrying	.0350	.0265	1.2802	.0855	.1340	.5787	.1376	.3193	.0422	.0596
4. Food processing	.0096	.0232	.0781	1.3387	.0835	.1187	.0839	.0750	.0404	.1623
5. Agro-based industries	.0570	.0187	.1659	.1018	1.5459	.1233	.0919	.1407	.0602	.0635
6. Other manufacturing	.0977	0.736	.5213	.2303	.3714	1.6183	.3819	.7445	.1166	.1595
7. Utilities, transport and communication	.0131	.0160	.2380	.0751	.1009	.1587	1.3759	.1350	.1340	.0786
8. Building and construction	.0031	.0027	.0549	.0149	.0249	.0418	.0235	1.1614	.0126	.0511
9. Trade and distribution	.0195	.0231	.0847	.0883	.1160	.0907	.0642	.1068	1.0336	.0365
10. Other services	.0256	.0303	.3769	.1307	.2615	.2720	.3950	.2733	.2615	1.2501

Source of primary data : Central Bureau of Statistics, Input-Output Tables for Kenya, 1976, Nairobi : Government Printers, October, 1979.

Appendix Table 3  
KA\* Matrix - Kenyan Economy, 1976

Aggregate Sector	1	2	3	4	5	6	7	8	9	10
1. Traditional Economy	.8887	-	-	-	-	-	-	-	-	-
2. Agriculture	.0217	.9212	.0344	.3610	.0664	.0832	.0318	.0368	.0146	.0493
3. Mining and quarrying	.0102	.0078	.3743	.0250	.0392	.1692	.0402	.0934	.0123	.0174
4. Food processing	.0025	.0061	.0206	.3534	.0220	.0313	.0222	.0198	.0107	.0429
5. Agro-based industries	.0184	.0060	.0536	.0328	.4989	.0398	.0297	.0454	.0194	.0205
6. Other Manufacturing	.0241	.0182	.1289	.0569	.0919	.4002	.0944	.1841	.0288	.0395
7. Utilities, transport and communication	.0047	.0057	.0848	.0267	.0360	.0566	.4902	.0481	.0478	.0280
8. Building and construction	.0009	.0008	.0158	.0043	.0071	.0120	.0067	.3330	.0036	.0147
9. Trade and distribution	.0132	.0157	.0576	.0601	.0789	.0617	.0437	.0726	.7032	.0248
10. Other services	.0156	.0185	.2300	.0798	.1596	.1660	.2411	.1668	.1596	.7629
Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Source : Calculated as explained in the text.

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On aura pareillement pour les facteurs de production, en superposant les G modèles (3) :

$$(6) \quad g = y_b + w$$

Lorsque le nombre d'entreprises K dépasse le nombre des outputs J, on peut appliquer les moindres carrés aux modèles (5) et (6). Les estimations obtenues pour a et b sont sans biais si

$$E(u) = 0 \quad \text{et} \quad E(w) = 0$$

Remarquons avant de développer le modèle que les équations (2) ont en coefficients des lignes du tableau entrées-sorties et non des colonnes comme on pourrait s'y attendre. Les variables "expliquées" ici sont les inputs et non pas les outputs. Il ne s'agit pas d'estimer des fonctions de production, que ce soit selon une hypothèse de complémentarité (de type Léontief) ou admettant une certaine substituabilité. Précisément, les équations (2) donnent les quantités d'inputs demandées par les entreprises sachant qu'elles suivent toutes des fonctions de productions Léontief à entrées complémentaires et à rendements d'échelle constants pour chacune de leurs productions.

On notera alors le double statut du modèle linéaire tel qu'il est employé dans les équations (2) et (3).

Dans l'optique de l'économiste, il a pour objet de vérifier cette hypothèse de comportement économique des entreprises : une demande en facteurs de production, ou en entrées intermédiaires, proportionnelle à la valeur produite, quel que soit le système de prix ; autrement dit, une hypothèse de comportement des entreprises extrêmement fruste. Sa validité suppose que l'ensemble des entreprises vérifient l'hypothèse de la technologie Léontief pour chacun de ses produits. Elargir cette hypothèse en admettant des fonctions de production à facteurs substituables, revient à se placer dans les hypothèses du théorème de non-substitution (rendements d'échelle constants, un seul facteur primaire rare et pas de production jointe). Mais on ne peut guère aller plus loin et proposer les résultats comme formalisation de la demande des entreprises en biens intermédiaires.

On peut aussi adopter la démarche du comptable national quand il construit le TES. Pour lui, très peu d'hypothèses économiques, mais simplement l'objectif de résumer l'ensemble des flux au sein de la production, sans préjuger de la diversité des comportements individuels que ce résumé recouvre. Un cadre descriptif et non explicatif. Son problème se ramène à ceci : sachant un système de prix et de demande des biens et des facteurs, chaque entreprise vérifie une relation entre les inputs et les outputs donnée par les  $a_{ij}^k$ , dépendant de l'entreprise. Comment déterminer alors le  $a_{ij}$  macro-économique quand on agrège à la fois sur les agents et sur les biens ?

Dans cette optique empiriste, on cherche uniquement à régler un problème d'agrégation. Et le modèle linéaire intervient comme une façon, statistiquement contrôlée, de déterminer cette technologie "agrégée".

Bien entendu, les conclusions à tirer ne sont pas les mêmes dans les deux approches. Si la première peut être utilisée dans la vérification d'hypothèses sur le système productif (complémentarité ou substituabilité des entrées, productivité constante des facteurs selon la taille), c'est dans cette seconde approche que se place la méthode utilisée au Cameroun.

2. Pour chacun de leurs produits, les fonctions de production des entreprises sont à facteurs complémentaires et à rendements constants.

Ainsi l'entreprise produisant un bien particulier le fait selon une certaine structure d'inputs dépendant du produit. Ce qui lui est spécifique, c'est un certain aléa qui la fait s'écarter de cette structure fixe de coûts. Quand l'entreprise produit plusieurs biens, sa structure globale d'inputs sera le composé des inputs requis pour produire chacun de ses biens, toujours à une perturbation près.

Pour une entreprise  $k$ , l'hypothèse technologique faite implique pour la quantité utilisée de l'input  $i$  :

$$(1) \quad x_i^k = a_{i1} y_1^k + \dots + a_{ij} y_j^k + u_i^k$$

où

$x_i^k$  est la valeur de l'input  $i$  utilisé par l'entreprise  $k$

$y_j^k$  est la valeur du bien  $j$  produit par l'entreprise  $k$

$a_{ij}$  est la valeur de l'input  $i$  entrant dans une unité de bien  $j$

$u_i^k$  est un résidu aléatoire lié à l'utilisation de l'input  $i$  par l'entreprise  $k$ .

Pour un input  $i$  (ou bien un facteur  $g$  comme le travail, les impôts indirects...) on aura par conséquent  $K$  équations de la sorte, ( $K$  nombre d'entreprises de l'échantillon), qui permettent d'écrire les relations de base pour tous les inputs et tous les facteurs :

$$(2) \quad x_i = Y a_i + u_i \quad i = 1, \dots, I$$

$$(3) \quad x_g = Y b_g + v_g \quad g = 1, \dots, G$$

avec des notations vectorielles évidentes et où  $Y = [y_j^k]$  est la matrice ( $K, J$ ) des productions de  $K$  entreprises pour les  $J$  produits.

Si l'on écrit le modèle conjointement pour tous les inputs, on obtient, en empilant les équations (2) :

$$(4) \quad \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_i \\ \vdots \\ x_I \end{bmatrix} = \begin{bmatrix} Y & 0 \dots 0 \\ 0 & Y \\ \vdots & \vdots \\ 0 & Y \end{bmatrix} \times \begin{bmatrix} a_1 \\ a_2 \\ \vdots \\ a_i \\ \vdots \\ a_I \end{bmatrix} + \begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_i \\ \vdots \\ u_I \end{bmatrix}$$

(KI, 1)                      (KI, IJ)                      (IJ, 1)                      (KI, 1)

ou encore, de façon plus condensée :

$$(5) \quad X = Y a + u$$

## UN MODELE ECONOMETRIQUE POUR ESTIMER DES TABLEAUX ENTREE SORTIE : LE CAS DU CAMEROUN

par François MEUNIER

Ce papier traite d'une méthode de construction des tableaux entrées-sorties utilisée au Cameroun. L'approche employée est micro-économique : elle conduit à des estimations économétriques des coefficients techniques de branches à partir de données individuelles d'entreprise.

La méthode est issue des travaux de ARKHIPOFF et CHAUMONT (1975), qui l'utilisèrent les premiers au Cameroun, de G.J.A. MENSİK (1974) aux Pays Bas et GERKING (1976). Elle a été mise en oeuvre à la Direction de la Statistique de YAOUNDE par G. OSBERT et appliquée sur des données françaises par F. MEUNIER (1981). Dans une première partie, on présente la méthode en développant les problèmes économétriques qui ont été rencontrés. La seconde partie traite de sa mise en oeuvre au Cameroun.

L'idée sous-jacente à la méthode est de partir de données micro-économiques d'entreprise pour calculer les coefficients macro-économiques de branche. Quand toutes les entreprises sont "pures", c'est-à-dire quand chacune d'elles produit un seul produit, ce passage n'est pas difficile à faire puisque la simple agrégation des entreprises par produit donne les coefficients de branche. Mais en général, les entreprises sont diversifiées et les données comptables ne fournissent que les inputs et outputs associés sans détailler la façon dont chaque input est affecté à chaque output.

Le problème est dès lors le suivant : comment utiliser l'information contenue dans les documents comptables de chaque entreprise de façon à opérer cette affectation au niveau macro-économique ? Autrement dit, comment relier les bons inputs aux bons outputs ?

Depuis longtemps, on considère que ce problème doit être traité à l'aide d'un modèle probabiliste. Dans l'allocation d'un input à ses différents usages productifs, chaque entreprise de l'économie ou d'un échantillon représentatif s'ajuste statistiquement à une structure technique moyenne, selon l'hypothèse Léontief d'un coefficient fixe de branche. Le cadre probabiliste offre pour ce calcul au moins trois types d'avantages sur les méthodes déterministes. Il donne une mesure de la dispersion de coefficients. Il prend en compte le fait que les entreprises ne suivent qu'approximativement les hypothèses techniques. Il permet aussi de prendre en compte d'éventuelles erreurs statistiques dans les documents comptables.

### I. LE MODELE

#### A. Hypothèses :

On introduit les deux hypothèses suivantes concernant les techniques du système productif.

1. A chaque produit homogène de l'économie, on peut associer une unique technologie, qui dépend du produit et non pas de l'entreprise productive.



- /14/ BULMER-THOMAS, V., Application of Input-Output Analysis for Less Developed Countries (LDCs)  
Queen Mary Collège, Department of Economics, University of London, 1982.
- /15/ BRAUERS, W.K. and HURT, A.R., Impact du pole industriel d'Arzew sur l'environnement oranais, INPED, Algeria 1975.

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- /6/ BRAUERS, W.K., "De evolutie van de input-output technische coëfficiënten met bijzondere toepassing voor België", Revue belge de statistique et de recherche opérationnelle, May 1965, pp.11-40.
- /7/ BRAUERS, W.K., "De opstelling van een input-output tabel voor de Belgische economie in 1958", Cahiers Economique de Bruxelles, n° 21, 1964, pp.115-136.
- /8/ BOTTOMLEY, A., A Sixty Sector Input-Output World Model, University of Bradford, England, no date. See also in this report Appendix E : Some Existing World Models. For developing countries : Construction the UNIDO World Industry Cooperation Model, prepared by the International Centre for Industrial Studies, Vienna 1977.
- /9/ RASMUSSEN, P.N., Studies in Inter-Sectoral Relations, Copenhagen-Amsterdam 1956.
- /10/ GHOSH, A., "Input-Output Analysis with Substantially Independent Groups of Industries" Econometrica, January 1960, pp. 88-96
- /11/ National Institute for Statistics, Bulletin de Statistique "Tableau Entrées-Sorties de la Belgique pour 1970", n° 4-5, Brussels 1975.
- /12/ BACHARACH, M., "Estimating nonnegative matrices from marginal data", International Economic Review, n° 3, September 1965, pp. 294-310.
- /13/ BRAUERS, W.K. "Le travail comme élément d'une économie interdépendante dans les pays en voie de développement", ALA, College for Developing Countries, University of Antwerp, n° 8, 1980, pp. 23-28.

At another occasion the use of labor matrices in developing countries was suggested /13/. At that moment, labor will be the common denominator for all the sectors. The question posited is whether labor statistics are currently more available in developing countries than statistics in value terms. For that reason labor coefficients and a matrix of employment levels after the professional training are introduced. The conclusion of the research is that the labor approach is more complementary than substitutionary to traditional input-output tables, even if the last ones are incomplete in developing countries.

#### 8 - ON THE STABILITY OF TECHNICAL COEFFICIENTS IN D.C.'s

For the stability of technical coefficients in D.C.'s a distinction has to be made between the traditional sectors in rural areas and the non-traditional sectors. For the first ones, it is evident that there exists a long period of stability in technical coefficients. This may be the other way round for the non-traditional sectors, which may show a fast growth rate and a quick change in technical coefficients. However, information from developed countries may here be useful. As in the Western World the energy crisis of 1973-75 may have altered the technical coefficients in a substantial way. In that case the validity of input-output tables from after 1975 is only guaranteed. The possibility of the use of inverse models in developing countries and consequently the prediction and planning starting from a possible or desired final demand will depend on the a priori knowledge of ex-ante technical coefficients. Some authors are pessimistic about an application in that sense /14/.

#### 9. IS THE INPUT-OUTPUT APPROACH SUITABLE FOR PLANNING PURPOSES IN A DEVELOPING COUNTRY ?

The input-output approach is certainly very useful for planning purposes in a developing country. We advised to use it for the region of ORAN-ARZEW (Algeria) /15/. The expansion and the industrialization of the port of Arzew on basis of petroleum products and natural gas put an important drain on the agricultural population of the region, beside the wellknown problems of urbanization. The existing interdependence and the structural changes could be the building blocks form the basis for a prediction or decision model for planning purposes. In this way the final model would be a mixture of input-output and something else such as regression analysis, linear or quadratic programming, simulation etc ...

The conclusion is that the input-output approach is useful as an analytical tool for the economist and for the economic policy maker ; for the first one as an overall insight into the economy of a developing country ; for the second one as an instrument for changing policy measures (simulation). As a planning tool, the a priori input-output model is only a part of a larger model inspired by econometrics or systems theory.

### 7.3.1. Structure analysis comes first in developing countries

For developing countries the other way round has to be used, as sometimes no input-output table was set up in the past. The research on structural changes will mean here the study of the interdependent structure of the economy. Check list, check table and SWOT-analysis considerations will form a first basis of this research on interdependent structure. Sectors particularly important for the economy have to be studied in detailed monographs on these key sectors. It would be recommendable that in countries with a mono-culture, limited to one or two sectors, these sectors would be at least analysed thoroughly. For each key sector, two kind of equations will be finally given.

The first kind of equations will be of the form (I), (V) and (VII), with  $i = 1, 2$  if two key sectors are considered.

The other kind of equations will be of the form :

$$(X_i + M_i) = \sum_{k=1}^{k=n} x_{ki} + \sum_{k=1}^{k=n} m_{ki} + VA_i \quad (XVI)$$

with  $i = 1, 2$

$VA_i$  = as gross value added.

### 7.3.2. Extrapolation or intrapolation and price changes developing countries

In developed countries in an updating exercise the less important sectors are extrapolated from a previous input-output table after the marginal data.

In developing countries, this method may be less effective in absence of previous input-output tables. Here, intrapolation takes place from information borrowed from countries with an analogous structure.

Difference in price structure in the two countries also have to be taken into consideration.

### 7.3.3. Quantity Terms and Labor Units

Till now, the argumentation on input-output in developing countries was carried out in value terms. Is it not more useful for developing countries to come back to the original but theoretical approach of input-output in quantity terms ?

## 7.2. The P.E.S. method for a regional table

The elaboration of regional input-output tables is also a heavy money and time consuming business. Once again a short cut is used : the P.E.S.method.

The starting point is an existing national input-output table for a base year i.e. a transaction matrix  $o_x$  with elements :  $o_{q_{ik}}$   $o_{p_{ik}}$ . From this matrix a new matrix is derived :

$$p_x = (o_{q_{ik}} \ t_{p_{ik}}) \quad (x)$$

given  $t_{p_{ik}}$  with  $i, k = 1, 2 \dots, m$  (price variations).

Quantitative extrapolations mean that a new transaction matrix is composed :  $(p_x \ t_q)$  with  $(t_q)$  as a diagonal matrix

of given sectoral production indexes over the period,  $o \dots t$ .

In regional analysis, quantitative intrapolations replace the quantitative extrapolations. With other words, a new transaction matrix is derived, viz. :

$$q_j^x = (p_x \cdot t_j^q) \quad (xv)$$

with  $(t_j^q)$  as a diagonal matrix of given sectoral production indexes in region  $j$  and  $(p_x)$  as a national matrix, which may have the form of  $(p_j^x)$  if regional prices differ from national prices.

In an autonomous way the important producing sectors of the region are studied. The results are an input column and an output row per sector considered. These columns and rows replace columns and rows of the corresponding sectors in the matrix  $j \times x$ .

## 7.3. The P.E.S.-method as applied for a developing country

In general, in developed countries a series of older input-output tables exists. Therefore price and quantity variations generally come first and structural changes afterwards.

with :  $x$  : the column vector of the production totals  
 $m$  : the column vector of the imports  
 $y_{11}$  : the column vector of the final demand from  
domestic origin  
 $y_{21}$  : the column vector of the final demand from  
foreign origin  
 $q$  : the column vector of the row totals

b) column totals (secondary inputs)

$$k = x - v \quad (XIV)$$

with :  $x$  : the vector of the production totals  
 $v$  : the vector of the value added at market-  
prices  
 $k$  : the vector of the secondary inputs

Starting from a matrix of period 0 and the marginal data from period  $t$  an iterative procedure is used/12/ in order to bring correspondence between row and column totals (1).

After this step, the structure disappears as present in the matrix of period 0. Substitution (on the rows) as well as fabrication effects (on the columns) are automatically introduced in the new matrix.

This matrix had to be disaggregated into an import matrix and a domestic matrix. If their elements are not present for period  $t$ , the elements from the matrix of period 0 have to be used. Row totals of both matrices have to add up to input totals and production totals respectively. Once again an iterative method is used in which the original structure of period 0 disappears.

#### Structural Changes :

In an autonomous way the most important producing sectors are studied and not all the sectors for time and money saving reasons. The result will produce new columns and rows replacing the corresponding ones in  $q_x$ .

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(1) Iteration is the most suitable if it is done step by step for quantities and prices separately and not for quantity and price changes together.

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## 7 - APPLICATION OF A SHORT-CUT METHOD : THE P.E.S. -METHOD

### 7.1. The national P.E.S. method

The setting up of complete national input-output tables is a heavy money and time consuming business. Moreover, official input-output tables have rather a late date of publication even in developed countries. The last officially published input-output table for Belgium e.g. concerns the year 1970 /11/.

For these reasons, "shortcut methods" for setting up input-output tables are used. We already applied such a method for the 1958-input-output table for Belgium on the basis of the 1953-table. In this method, called the P.E.S. method, three stages are foreseen : Price variations, Extrapolations (quantitative) and Structural changes.

Till now the input-output system operated in value terms (products of quantities and prices together). From now on a distinction is made between prices and quantities.

#### Price Variations :

$$O_X = (O_{q_{ik}} \cdot O_{p_{ik}}) \quad (IX)$$

a new matrix is derived :

$$P_X = (O_{q_{ik}} \cdot t_{p_{ik}}) \quad (X)$$

#### Quantitative Extrapolations :

$$q_X = P_X \cdot t_{\hat{q}} \quad (XI)$$

In economics however, data are given by rows and columns (the marginal data). Have to be considered as given per sector : final demand, imports, value added and production. The "marginal data" in constant prices are composed as follows :

a) row totals (intermediate outputs)

$$q = x - y_{11} \quad (XII)$$

$$i = m - y_{21} \quad (XIII)$$

6 - SWOT-ANALYSIS FOR A DEVELOPING COUNTRY THROUGH INPUT-OUTPUTTABLES

Some definitions have to be given in the framework of input-output analysis.

Table III : Triangularization Effects in a Developing Country

	1	2	3	4	5
1	$x_1$	0	0	0	0
2	$x_{21}$	$x_2$	0	0	0
3	$x_{31}$	$x_{32}$	$x_3$	0	0
4	$x_{41}$	$x_{42}$	$x_{43}$	$x_4$	0
5	$x_{51}$	$x_{52}$	$x_{53}$	$x_{54}$	$x_5$

Sector 1 possesses a power of dispersion which is extremely important in any case if  $x_{21}$ ,  $x_{31}$ ,  $x_{41}$ , and  $x_{51}$  are very significant. Sensitivity of dispersion is the largest in sector 5, if  $x_{51}$ ,  $x_{52}$ ,  $x_{53}$ , and  $x_{54}$  are very significant. Table III also shows a triangularization effect /9/.

As shown in table I, power of dispersion and sensitivity of dispersion are only found in the industrial and not in the rural areas in developing countries. Dispersion effects possess however their own characteristics in D.C.'s. Power of dispersion is very relative in D.C.'s, as this power is very often exercised on foreign imports, which are rather elastic in their supply due to lack of financial funds of the D.C.'s. Sensitivity of dispersion is very large in a developing country, on the one side through the instability of internal demand from industrial or private origin, on the other side through the instability in sales to developed countries. Finally, as remarked earlier, block formation is a characteristic in the economy of a developing country /10/.

Till now the input-output approach was explained in terms of values : the importance of quantities multiplied by prices. From now on, statistical fitting of input-output tables will be discussed. As statistics are rather limited a short-cut method will be shown : the P.E.S. -method.



It is strange that capital input is more important than the labor input in a developing country. It stems from the fact that labor is underpaid and capital is scarce i.e. very expensive (1). An example is taken from the Egyptian economy.

Table II : Factor Shares in the Egyptian Economy 1970.

SECTOR	PRIVATE SECTOR			PUBLIC SECTOR	
	LABOR	CAPITAL	RENT	LABOR	CAPITAL
1. Staple Food	0.443	0.306	0.251	0.464	0.536
2. Non-Staple Food	0.372	0.402	0.226	0.312	0.688
3. Cotton	0.456	0.312	0.232	-	-
4. Other Agriculture	0.451	0.182	0.367	-	-
5. Food Processing	0.299	0.701	0.0	0.539	0.461
6. Textile Industry	0.314	0.686	0.0	0.687	0.313
7. Other Industries	0.383	0.617	0.0	0.358	0.642
8. Construction	0.496	0.504	0.0	0.529	0.471
9. Crude Oil & Products	0.070	0.930	0.0	0.604	0.936
10. Transportation and Communication	0.388	0.612	0.0	0.387	0.613
11. Housing	0.400	0.600	0.0	0.110	0.880
12. Other services	0.400	0.600	0.0	0.909	0.091

Source : R.S. ECKAUS, F.D. MC CARTHY, A MOHIE-ELDIN

Social Accounting Matrix for Egypt 1976

February 1980, Working Paper, International  
Institute for Applied Systems Analysis (IASA) Laxenburg,  
Austria

(1) It is due to the fact that traditionally input-output tables are expressed in value terms. In quantity terms however, labor would show a larger importance.

TABLE 1

TABLE I-TRANSACTION MATRIX FOR A L.D.C.	Rural area I A F M H T	Rural area II A F M H T	Industrial zone 1 2 3 4 5 6 7 8 9 10 11	Consump- tion	Invest- ments	Final sector Stocks	Exports
$1^R_1$ Agriculture (A) (+ tobacco)	1			3	-	-	2
$1^R_2$ Fishing (F)				2			
$1^R_3$ Mining (M)							
$1^R_4$ Handicraft (H)	1			2			
$1^R_5$ Trade (T)	1 1 1 1 1			2			
$2^R_1$ Agriculture (+tobacco)		1		3	-	-	2
$2^R_2$ Fishing				2			
$2^R_3$ Mining							
$2^R_4$ Handicraft		1		2			
$2^R_5$ Trade		1 1 1 1 1		2			
$3^R_1$ Agriculture (+tobacco)			1	1			
$3^R_2$ Mining			2 2 2 - - - - -	-			3
$3^R_3$ Industries I			1 1 2 1 2 2 2 2 - - -	2	2		-
$3^R_4$ Industries II			2 2 2 2 2 1 1 1 1 1 1	2	1		-
$3^R_5$ Electricity			1 2 2 1 2 2 - - 2 2 2	2			
$3^R_6$ Railway			1 3 2 - 3 1 - - 2 1 1	2			
$3^R_7$ Water transport			1 1 2 - 3 - 2 1 - 1 -	1			
$3^R_8$ Sea transport			1 2 2 - - - 1 1 - 1 -	1			
$3^R_9$ Auto transport			1 1 1 - 1 - - - 2 1 2	3			
$3^R_{10}$ Trade			1 1 1 - - - 2 2 2 2 2	3			
$3^R_{11}$ Modern services			1 2 1 - 3 2 2 2 2 2 2	2			
$C^I$ Competitive Imports							
$C^I_1$ Agriculture (+tobacco)				3			
$C^I_3$ Industries I (machinery)			3 3 3 3 3 3 3 3 3 3 3	-			
$C^I_4$ Industries II (construction materials)			3 3 3 3 3 3 3 3 3 3 3	2			
$C^I_8$ Sea transport			3 3 3 3 3 3 3 3 3 3 3	1			
$C^I_{10}$ Trade			2 2 2 2 2 2 2 2 2 2 2	-			
$C^I_{11}$ Modern services			2 2 2 2 2 2 2 2 2 2 2	-			
$n^I$ Non-competitive imports			3 3 3 3 3 3 3 3 3 3 3	2			
T Indirect taxation on imports			1 1 1 1 1 1 1 1 1 1 1	1			
$V_1$ Value added (Labor)	1 1 1 1 1	1 1 1 1 1	2 2 2 2 2 2 2 2 2 2 2	1			
$V_C$ Value added (capital and rent)			3 3 3 3 3 3 3 3 3 3 3				
Total Production							

#### 4. EXAMPLE OF THE ELABORATION OF A CHECK LIST

The check list given here is not a complete list but only a possible example of application of the method of check lists :

- degree of existence of a subsistence economy ;
- degree of existence of the first dualism (agricultural-industrial or rural-urban) ;
- degree of existence of the second dualism (the formal or capitalist versus the informal or traditional sector) ;
- subdivision of the formal sector into nationalized or non-nationalized subsectors ;
- degree of existence of mono-culture ;
- size of the firms (small business versus large multi-nationals) ;
- covariance between the size of firms, the formalization and the nationalization of sectors ;
- existence of a primary, secondary and tertiary sector ;
- degree of availability of ;
  - . production statistics
  - . final demand statistics
  - . importation statistics
- degree of control of these statistics by international organization such as I.M.F., World Bank etc ... ;
- degree of standardization of these statistics.

#### 5. EXAMPLE OF THE ELABORATION OF A CHECK TABLE

As for the check lists, the check table is kept very broad in order to give a general application for all possible L.D.C.'s (See table I).

Consider an imaginative less developed country consisting of three regions : two rural areas and one industrial zone. Indeed polarization in less developed countries generally means a disequilibrium to the advantage of one or some industrial zones (mostly the capital or a mining region) without any link with the remainder of the national territory. This is called in input-output terms : block formation. There are no or limited input-output relations between these blocks. This is understandable as the industrial zone is contrasted with rural areas and their traditional sectors : agriculture, fishing primitive handicraft and trade.

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Are these domestic and ipso facto external technical coefficients also constant over a certain time period ? The problem is less relevant in countries like the U.S. or Japan, where national imports for the whole economy are relatively unimportant. This is certainly not the case in Western Europe, where international trade is one of the main features of economic activity and where price elasticity of imports is large. In any case import substitution will be different after the final destination of goods and services : viz. importation for intermediate or for final demand.

Perhaps a better insight in the flows between the input-output tables of the C.E.E.-countries will shed some light on the import substitution problem. Another suggestion may be to link the national input-output tables to one or another sectoral world model, suggestion which is also very useful for developing countries /8/.

Input-output data are in general presented in tables, in such a way that the link is easily made with matrix algebra. Moreover, each column vector of intermediate demand gives the production function of a sector.

### 3 - INPUT-OUTPUT IN DEVELOPING COUNTRIES

The elaboration of input-output tables for developing countries is a very strenuous work, mostly due to the fact that statistical data are lacking. For that reason special or indirect methods are proposed here.

First of all, check lists and a check table are presented as a pre-testing exercise for the elaboration of an input-output table in a developing country. Check lists and check table are kept very broad in order to give a general application for all possible D.C.'s.

The second step is a SWOT-analysis in which the strength is explained by the dominant sectors in the economy of the D.C. under consideration. A thorough study is made of these dominant sectors.

This thorough-going inquiry will form the structural basis for the indirect elaboration of input-output tables by the P.E.S. method ; method which was at different occasions applied by the author in cases where statistical data are incomplete. The P.E.S. method will :

- extrapolate or intrapolate data in a time or in a spatial relationship (E) ;
- apply the correct price scheme (P) ;
- introduce the above cited structural studies into the framework of the sectors obtained by extra- or intrapolation.

then :

$$(I-A)x = y \quad (III)$$

and if :

$$|I-A| \neq 0$$

then :

$$x = (I-A)^{-1}y \quad (IV)$$

The inverse model is very often used for prediction and planning purposes starting from a possible or desired final demand.

What is the behavior of imports in the national model ?  
If the national economy is closed for international trade then  $M_i = 0$  and  $m_{ik} = 0$ . Otherwise the system of equations (with a total delivery transaction matrix) is split up into two sub-systems.

The first one concerns a domestic transaction system :

$$X_i - x_{i1} - x_{i2} - \dots - x_{ik} - \dots - x_{in} = Y_{i,n+1} \quad (V)$$

with as production coefficients :

$$d_{ik} = \frac{x_{ik}}{x_k} \quad (VI)$$

( $d_{ik}$  stands for production or domestic technical coefficient)

The other sub-system (imported transaction system) is :

$$M_i - m_{i1} - m_{i2} - \dots - m_{ik} - \dots - m_{in} = m_{i,n+1} \quad (VII)$$

with as technical coefficients :

$$e_{ik} = \frac{m_{ik}}{x_k} \quad (VIII)$$

( $e_{ik}$  stands for external technical coefficient)

It would be interesting to look after any regularity over time in the behaviour of the technical coefficients. Unhappily, statistical information on the technical coefficients is too limited to set up time series for a sufficiently long time.

LEONTIEF made the following important statement " Anybody familiar with the economies of industry and agriculture knows that most of the major technological developments are well discernible far in advance of their actual culmination, while minor innovations are frequently planned by leading enterprises well ahead of their general adoption". /4, p. 152/. His experiences on the 1919-29 period and his postdictions from 1939 to 1929 are well known /4/. CAMERON cited a stability for the technical coefficients for five till ten years /5/. We do not think that such a long period of stability is acceptable for Western Europe after the Second World War. Indeed, Western Europe had to catch up with the industrial development of the United States. We found out that the first Belgian input-output table (1953) was out of date in 1958 /6/. Therefore, we set up a 1958 national table /7/. The fact that the European Economic Commission asks the member-countries to elaborate an input-output table for approximately each five years (1959, 1965, 1970 and 1975) shows the necessity for this updating for all the membre countries. Moreover, the period 1973-1975 may be considered as a trend break period. On the one side, since the energy crisis of 1973-1974, the energy inputs in the input-output sectors were disturbed and essentially changed. On the other side, for the first time since the Second World War significant negative growth rates were observed in the United States, Japan and Great-Britain in 1974 and in the United States, Italy and Belgium in 1975, while Western Germany had a zero growth rate in 1975. Since then nearly all the countries of the industrialized world show tremendous high inflation and interest rates. It is quite clear that technical coefficients (including also sectoral value and importcoefficients) are seriously altered since 1973-1975. For that reason the actual validity of input-output figures from before 1975 is doubtful. The consideration of trend breaks is also very important for developing countries.

Once the stability of technical coefficients accepted, it is not difficult to explain the inverse models as expressed in matrix algebra.

Suppose :  $X$  as the matrix of total and sectoral intermediate demand  
 $x$  as the vector of total deliveries originating from internal production or from imports  
 $I$  as the identity matrix  
 $A$  as the matrix of technical coefficients defined as :  $A = X \cdot \bar{x}^{-1}$   
 $y$  as the vector of sectoral final demand;  
 $(I-A)$  as the technological matrix ;

In a modern economy, however, sectoral production is not directly made for final demand but also for semi-products or for products which are inputs into the other sectors. We call the latter "intermediate demand". Intermediate demand will be presented by small  $x_{ik}$ , i.e. an input from sector  $i$  into sector  $k$ . This intermediatedemand may also be satisfied by imports, presented by small  $m_{ik}$ , i.e. an import from foreign sector  $i$  into sector  $k$ .

The final purpose of this model building is to study the repercussions of the means on the expenditures and vice versa (inverse models). Such an analysis is called input-output, the name given by the pioneer in this field, W.W. LEONTIEF /1/.

The principle goes back to the idea of general interdependence, already found in QUESNAY's "Tableau Economique" : "One hundred and fifty years ago, when Quesnay first published his famous schema, his contemporaries and disciples acclaimed it as the greatest discovery since Newton's laws. The idea of general interdependence among the various parts of economic system has become by now the foundation of economic analysis". /1, p. 105/. The real father however of general interdependence and also of mathematical economics is L. WALRAS/2/.

The fact has also to be mentioned that our analysis does not take the factor time into consideration till now. Repercussions are either immediately viz. maximum one year or involved in time, without knowing at what moment they will occur. "We may say that a system is dynamical if its behaviour over time is determined by functional equations in which 'variables at different points of time' are involved in an 'essential' way."/3, p. 314/. In this sense we limit ourselves to a static analysis.

## 2. THE INTERSECTORAL MODEL OPEN FOR INTERNATIONAL TRADE

$$(X_i + M_i) - (x_{i1} + m_{i1}) - (x_{i2} + m_{i2}) - \dots - (x_{ik} + m_{ik}) - \dots \quad (I)$$

$$- (x_{in} + m_{in}) = (Y_{i,n+1} + m_{i,n+1})$$

with  $i = 1, 2, \dots, n$

$n$  being the number of sectors.

From this system of equations, the definition of technical coefficient is derived :

$$a_{ik} = \frac{(x_{ik} + m_{ik})}{X_k} \quad (II)$$


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## SPECIAL METHODS FOR AN INPUT-OUTPUT APPROACH IN DEVELOPING COUNTRIES

by Willem K. M. BRAUERS

Economic information on developing countries is rather limited. The input-output approach may be helpful here. In which way ?

Firstly, the rather scarce existing economic information on developing countries is classified through the interdependence philosophy of the input-output approach.

It is clear that for developing countries input-output will have a broader meaning than in developed countries. That is the reason why we speak of an input-output approach rather than of input-output tables. Secondly, this input-output approach will form the basis for an analytical model for a developing country from which economic policy conclusions may be derived. Thirdly, the inverse input-output model may be helpful for prediction and planning purposes in a developing country.

First of all a general insight is brought into static input-output analysis ; dynamical analysis being too sophisticated even for developed countries. Then special methods are introduced which make the application of input-output for developing countries. Then special methods are introduced which make the application of input-output for developing countries possible.

### I - INPUT-OUTPUT ANALYSIS

The purpose of input-output is to analyse, predict or decide upon the national economy but in such a way that the national economy is disaggregated into sectors, branches or product classes on the one side, into regions on the other. Furthermore, the national economy is considered as open to international trade. It signifies that the means of the national economy come either from the own production ( $X_i$  for sector  $i$ ) or from importation ( $M_i$  for sector  $i$ ). These means are used for the own consumption (private or public), for investment and for exports, while the remainder is piled up in desired or undesired inventories. All these expenditures are represented by  $(Y_{i,n+1} + m_{i,n+1})$  for e.g. sector  $i$  delivering to final demand  $n+1$ .



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SESSION 3

We conclude with a plea for more extensive computerisation of national accounts and related economic statistics, which with recent developments in micro- and mini-computers and interactive systems is now a much less costly exercise. Discussion of the uses and advantages of computers in the compilation of national accounts is beyond the scope of this paper, but two advantages which may be briefly mentioned here are :

- (a) the more rapid processing and dissemination of data, thus reducing the time lag in the availability of up-to-date statistics ;
- (b) the facility to re-assemble primary data in alternative forms of classification and aggregation, i.e. increased flexibility in use of data .

inter alia, collect information on the occupational structure of employment by sector and the earnings of different occupational groups. Although labour force surveys, like censuses of population, cannot be seen to fall within the area of national accounts estimation, the earnings data can assist in the estimation of national income and the occupation-industry employment data are essential for manpower policies and projections. Assuming that a large-scale labour force survey is conducted once in the course of the 5-year planning cycle, the inclusion of employment questions in the annual sample inquiries referred to in the previous section will enable the benchmark labour force data to be updated.

## V. SUMMARY AND CONCLUSIONS

The compilation of reliable national accounts data is a means to more efficient management of the economy, including the formulation and implementation of development plans, which is the primary concern of this paper.

Although the conceptual framework, needs and objectives of development planning vary from country to country, with respect to national accounts data a number of general and particular principles can be proposed. At the most general level, the schedule of survey work required for national accounts should be co-ordinated with the normal planning horizon, so that a regular and up-to-date flow of data is available to the planners. This implies at least one and probably two censuses or major surveys each year, supplemented by regular annual sample inquiries for inter-censal years, the whole cycle of censuses and surveys being repeated at 5-year intervals.

Given the typical priorities and constraints in development planning, a number of priority areas in national accounts estimation were suggested. These include as expected agriculture and industry, but also construction and distribution, about which there is typically a serious absence of information in developing countries; an annual multi-purpose household survey was also recommended, and the importance of retail and wholesale price index numbers to convert national accounts data to constant prices was stressed. Finally, though not central to national accounts estimation, a regular labour force survey was suggested. For years in which an industrial census is carried out an input-output table should be constructed. Apart from its value as a planning tool, the process of balancing input-output tables can highlight inconsistencies in the national accounts and enable revisions to be made.

While emphasising these priority areas, other sectors such as tourism, transport and communications, finance and small-scale or artisan industries should not be overlooked, and if resources permit regular surveys of these sectors should be carried out, though perhaps at less frequent intervals.

Although the adoption of such a programme may imply a substantial increase in resources allocated to national accounts work, the potential payoff from an improved series of national accounts statistics is large and the cost is small in relation to total expenditure on administration and regulation of the economy. Better statistics will yield better-informed decisions and policy evaluations.

Given capital stock in any base year, and a time series of net investment for succeeding years, a time series for capital stock by sector can be compiled. Allied with data on changes in output over the same period, incremental capital-output ratios can be calculated and these can be used by the planners to estimate capital requirements for the next Plan period. However it must be admitted that the use of historical capital-output ratios to estimate future capital requirements in developing countries is subject to severe qualification. If the existing industrial base is small, and major industrial developments are planned to transform the structure of industry, historical capital-output ratios may be meaningless. Moreover in many developing countries there are problems of under-utilisation of capacity (due to market limitations, frequent breakdowns and lacks of spare parts), so that observed capital-output ratios may be influenced more by capacity utilisation than by technical conditions of production. Thus, while data on capital stock by sector are very useful for planning purposes, their value lies mainly in assessing plan performance rather than as a statistical forecasting device.

In recent years the problem of estimating the contribution of the informal or traditional sector to gross domestic product has received much attention. There are two aspects to this problem. The first is that of estimating the actual output and added value of the informal sector for inclusion in the national accounts. Otherwise gross domestic product will be substantially under-estimated. The second aspect, with which we are concerned here, is the significance of the informal sector in relation to development planning. In this respect, the fact that the activities of the informal sector cannot be easily measured is not necessarily a serious problem, except possibly in a small number of sectors where the informal sell goods and services to the "modern" sector e.g. metal goods, building materials, and hence is partly linked to the development of the rest of the economy. Hence, while the informal sector poses a challenge to national income statisticians, the absence of data is not generally a serious lacuna for development planning.

For years in which an input-output table is constructed, the contribution of the informal sector can be estimated through commodity balances (in fact commodity balances can be estimated independently of input-output tables). For any commodity or commodity group, domestic supply can be defined as imports plus output of the modern sector plus output of the informal sector, sales to households, exports, stock changes, investment and government. If all other elements in this supply-demand equation can be estimated independently, and adjustments made for trade margins and indirect taxes, the output of the informal sector can be estimated as a residual. It is hardly necessary to stress the hazardous nature of such a calculation, since many of the other items are also subject to large margins of error. However, this approach should yield rough orders of magnitude for the informal sector and indicate its significance as a supplier of certain goods and services. It will be noted that this method of estimating informal sector output implies the availability of independently estimated household expenditure data for the year in question.

The conventional national income accounts do not offer much information on income distribution, apart from distinguishing income from employment and other forms of income (mainly profits). Data on income and employment can be obtained through the multi-purpose household surveys discussed above, but it is desirable to supplement this by regular labour force surveys which will,

take the form of a conventional household budget inquiry, detailing expenditure on a large range of commodities and services, while for intervening years records of expenditure would be highly aggregated and would be used simply for updating the previous base-line data. In these other years the focus of the inquiry would be on different subjects - for example employment and occupational status, or educational qualifications, or migration, and so on. As mentioned above aggregate consumption expenditure is often calculated as a residual in the national accounts, so that the results of a household budget inquiry can be valuable as an independent cross-check on the national accounts estimate, as well as providing a means of estimating the pattern of household expenditure. Household budget data are also invaluable as a means of projecting future patterns of expenditure and savings and of assessing the potential impact of price or tax changes on the cost of living and the distribution of income.

To summarise the preceding discussion, the following are identified as priority areas in national accounts estimation :-

Agriculture	)	
Industry	)	Census or large-scale survey every 4 or 5 years,
Construction	)	with sample inquiries for intervening years
Distribution	)	
Multi-purpose household survey		Annual, but variable in scope and coverage
Indices of wholesale and retail prices		Annual and quarterly

#### IV. SPECIAL PROBLEMS

This section discusses a number of recurrent problems of data collection with particular reference to the priority areas listed in the previous section and, where possible, suggest possible solutions. The selection of topics for discussion is however highly subjective and it is not suggested that these are the only or even the principle problems which face national accounts statisticians.

As noted in Section II, capital requirements and the availability of investment funds often set the effective upper limit on the planned rate of growth of the economy. To estimate capital requirements it is desirable to have data on the stock of capital in some reference year, and a time series of investment (gross or preferably net) by sector. Data on capital stock can and should be collected as part of the periodic (4 or 5 year) censuses of industry, agriculture, etc., and data on investment flows can be collected as part of the annual sample inquiries in each sector. Since the latter are based on a sample they have to be scaled up, which leads to sampling errors, but a feasible alternative in many cases is to derive control totals for aggregate investment from import statistics of capital goods. In the majority of developing countries at the present time, there are no indigenous capital goods industries outside construction, so that expenditure on machinery and equipment is wholly imported.

quantity of information on construction and services is unsatisfactory, to put it mildly. Yet data on these sectors is vital for planning purposes, and the lack of such data can cause serious errors in estimates of current GDP, in projections of GDP and in estimates of investment, imports, incomes and employment. The construction sector is a major contributor to GDP and to changes in GDP in both urban and rural areas ; it is often a major source of import demand for both intermediate and capital goods, and its output contributes the overwhelming proportion of the domestic share of gross fixed capital formation. Unfortunately it must be admitted that there are considerable difficulties in making accurate estimates of the level of and year-to-year changes in construction output, for various reasons including the proliferation of small construction companies, the importance of "own construction" work, etc. Nevertheless a serious effort should be made to improve the supply of statistics on construction in view of its considerable impact on the development process. While space precludes an extended discussion, for monitoring year-to-year changes in the level of construction activity a number of indirect indicators may be useful supplements to direct sample inquiries; these include sales of cement, building permits issued and new utilities connections (e.g. electricity, water). To secure reliable base year data requires periodic censuses, and these pose formidable difficulties. Perhaps the best approach here is to decentralise the data collection process, requiring the local authorities to undertake comprehensive surveys of construction work in their area every five years ; aggregate data can then be checked by reference to indicators such as building permits issued, the domestic absorption (infrastructure) projects are usually the responsibility of central government departments and the value of work done is (in principle) directly available.

There are three main reasons for undertaking regular censuses or large scale surveys of commerce or internal trade, with sample inquiries for intervening years. In the first place this sector generates a significant proportion of gross domestic product and an even greater share of total domestic employment. Secondly, results of surveys of retail and wholesale trade can act as crosschecks on or as indicators of trends in consumption expenditure, which in many developing countries is estimated as a residual element in the national accounts and is therefore subject to significant but indeterminate margins of error. Thus if a sample retailing inquiry suggests an annual rise of 8 % in retail sales, while consumption expenditure as measured in the national accounts is recorded as increasing by 3 % over the same period there is a suspicion that the latter is underestimated, which in turn has implications for other components of the national accounts.

Finally, regular surveys of internal trade can be used to estimate wholesale and retail trade margins. These are necessary in compiling and balancing input-output tables, in particular in reconciling the difference between purchasers' and producers' prices. Moreover governments often have a strong interest in monitoring the behaviour of trade margins, particularly for basic consumer goods.

Turning to the personal sector, the most urgent priority here is a regular (i.e. annual) household survey. To save on resources, this should be a multi-purpose household inquiry which varies (but in a systematic way) in size and content from year to year. Thus every five years the inquiry should

At the most aggregative level the main sub-divisions of economic activity which are of interest for planning purposes are agriculture, mining and manufacturing, construction, utilities, transport and communications, and services ; transactions with the rest of the world (foreign trade, etc.) ; household incomes, consumption and savings ; capital stock and investment and, at least for some countries, expenditure on tourism and travel. For some of these categories specially-designed surveys are not required since comprehensive data are already available, most notably in the case of commodity trade with the rest of the world. However information on trade in services (including tourism and travel) and other transactions on current and capital account is often lacking ; if non-commodity flows are an important component of the balance of payments, then periodic surveys of external trade in services (perhaps in conjunction with the Central Bank) should be undertaken.

Turning to the production sectors, within each 5-year cycle a sequence of censuses or large-scale surveys should be undertaken for agriculture, industry (mining and manufacturing), construction and commerce (retail and wholesale distribution), with annual sample inquiries for non-census years. For years in which an industrial census is carried out, it is desirable to construct an input-output table of the economy, which would be a valuable descriptive and analytical tool in the preparation of the next 5-year plan.

A primary purpose in carrying out a census of agriculture, industry, etc. is to obtain accurate estimates of the contribution of these sectors to gross domestic product and to serve as reliable "base-line" estimates for the updating and projection of national accounts aggregates. In addition of course they also provide valuable information on the structure of production, on employment and productivity, on input structure and linkages, and so on. The main purpose in conducting the intervening sample inquiries is to provide indicators for updating the base-line national accounts aggregates, and here two points may be stressed. First, provided the base-year (census) data is comprehensive and reliable, accurate updates can be achieved using quite small (albeit carefully designed) sample inquiries, in which the information sought is the minimum necessary to update the base year aggregates. The smaller and simpler the sample is, the higher will be the response rate and the quality of the data.

Secondly, for planning purposes it is necessary to have times series of national accounts data in constant as well as current prices. For this reason it is essential to devise and construct a reliable series of wholesale and retail price indices which can be used to deflate GDP current value components. Especially in periods of rapidly rising prices, errors in estimates of relative price changes can cause significant errors in estimates of real rates of growth. While information on prices could be collected as part of the sample production inquiries referred to above, for statistical reasons (sample design and coverage) it is preferable to establish separate survey procedures to compile price index numbers. It may be noted here that in most developing countries a dominant influence on price changes is import prices, so that accurate import price indices are important.

While little need be said here about the merits and uses of censuses of agriculture and industry, in most developing countries the quality and

are often pitifully small in number. However, as implied above, the way in which existing resources are used does not necessarily correspond to the priorities of economic planning. All too often, a disproportionate share of resources is devoted to the collection of data on the modern industrial sector, while little or no systematic data are collected on the services sector and construction, although taken together these two sectors not only account for a major share of gross domestic product but quite frequently constitute the most dynamic element within the economy.

To summarise, the compilation of national accounts data must be regarded not simply as an end in itself but as an essential basis for sound economic planning. In turn, the priorities in national income accounting should reflect the philosophy and framework of development planning, and in particular the key relationships and constraints in the development process. It may be worth recalling here that the basic framework of national income accounting is still heavily grounded in Keynesian and post-Keynesian theories of income determination, and this influences the way in which we define and use the principal components of the national accounts. Without questioning the basic accounting principles, the theory of development may lead us to give a somewhat different emphasis to the measurement of economic activities, stressing perhaps the composition and origin of aggregate supply rather than the level and pattern of aggregate demand.

### III - THE COMPILATION OF NATIONAL ACCOUNTS DATA

As a general principle, the most cost-effective method of compiling a regular series of national accounts data involves determining the optimal combination of census and sample survey inquiries. For example, a census of agriculture may be undertaken in year 0, followed by sample inquiries in years 1, 2, 3 and 4, and then another census in year 5 (as a result of which revisions may be made to the sample-based estimates of agricultural output, employment, etc. in years 1-4). The structure and periodicity of census and sample inquiries for national accounts will vary according to the circumstances of particular countries, but in the following paragraphs we suggest a number of general guidelines, while the following section of the paper discusses some specific issues of data collection.

In most developing countries economic development plans are based on a 4-6 year time horizon, most commonly 5 years, sometimes complemented by outline or perspective plans for 10, 15 or even 20 years ahead. This suggests that the planning of survey work for national accounts (as well as for other purposes) should be based on a similar 5-year cycle, in the sense that at least one major survey or census should be planned for each major sector of the economy within that five-year cycle. Ideally, it would be desirable to time the incidence of major surveys within each cycle in concordance with planning priorities. Thus if the main thrust of a 5-year development plan is on, say, manufacturing industry, it would be best to undertake a census or large-scale survey of manufacturing industry in year 4 of the preceding plan period, allowing at least a year for the processing and analysis of the data. Conversely, the timing of a regular census of agriculture is probably less important, since even if agriculture is a major sector of the economy, its structure changes very slowly and it is usually feasible to accurately evaluate trends in agricultural output by sample survey methods.



In using national accounts data for economic planning, two types of problem are typically encountered. The first is the lack of information on certain key variables - for instance output and employment in services and construction, trade margins, prices, capital stock, etc. - which are essential to plan formulation. The second is the absence of up-to-date information for monitoring plan performance. Plans which relate to a 5 or 10 year time horizon need to be continuously revised in the light of contemporary (unforeseen) circumstances, if they are to be useful for practical policy purposes, and this means that the data base on which the plan is formulated must be continuously updated. All too often a great effort is devoted to collecting data during the phase of plan preparation, while little thought is given to updating the base year data during the period of plan implementation.

Apart from providing quantitative substance to the aspirations of a development plan, the most important use of national accounts data is in ensuring consistency in plan targets and in identifying the effective constraints to the rate and pattern of development of the economy. At the macro-economic level, developing countries typically face both capital and foreign exchange constraints, in the former case through low levels of domestic savings in comparison with ambitious investment plans, in the latter case through the need for imports of capital goods and intermediates required to sustain industrialisation. Given that one or the other of these constraints is likely to be a critical determinant of the highest feasible rate of growth of the economy, national accounts data on income and income distribution, consumption and savings, changes in output and investment in the major sectors of the economy (in order to calculate incremental capital-output ratios), imports (distinguishing imports of consumer goods, intermediates and capital goods) and foreign exchange earnings (distinguishing exports of goods and services, factor incomes, remittances and autonomous capital flows) are of particular importance.

These requirements in fact include all the major national income and expenditure aggregates, but the emphasis given here on their use as instruments of plan formulation and monitoring may suggest some re-ordering of priorities in the collection and presentation of national income statistics. For instance, although import statistics are amongst the most reliable of data in developing (and developed) countries, in very few is there an accurate or regular breakdown of imports into consumer goods, intermediate inputs and capital goods, although such a breakdown is extremely useful in estimating future import requirements and in the formulation of fiscal and tariff policies. Again, data on investment by sector, very important for estimating future capital requirements and hence the level of required investment funds, are often very scanty. As a third example, statistics of personal incomes and household expenditures, important for estimating future consumption requirements, savings propensities and the redistributive effect of various development policies, are often virtually non-existent or, if they exist, often very out-of-date.

These deficiencies are of course partly due to the fact that insufficient resources are devoted to the systematic collection and publication of national accounts statistics, and one purpose of this paper is to stress the need for more resources to be devoted to such work. In comparison with the large numbers of civil service cadres employed in administrative or regulatory capacities, those employed in the collection of basic data for planning

THE USE OF CENSUS AND SURVEY DATA IN COMPILING  
NATIONAL ACCOUNTS

by J.W. Mc GILVRAY

I. INTRODUCTION

This brief paper is based on the author's experience in working with national accounts data in a number of developing countries, primarily on projects concerned with national or regional development planning. It is therefore written from the perspective of a user of national accounts statistics, mainly for purposes of economic planning. National accounts of course have a wide range of applications other than those concerned with planning, so that the views expressed below on the major problems and priorities in national accounting in developing countries do not claim to constitute a comprehensive evaluation. Nevertheless the issues discussed here touch on a wide range of the most important features of the national accounts.

The remainder of the paper comprises four sections. Section II considers the role of national accounts data in economic planning and identifies a number of key national accounts data series essential for planning purposes. Section III discusses how such data series may be compiled by means of periodic censuses and surveys, and how existing data series may be updated. Section IV discusses a number of special problem areas of data collection and suggests various ways of overcoming some of these problems. Section V summarises the paper, and also briefly refers to the use of computers in the organisation of national accounts data.

II. NATIONAL ACCOUNTS AND ECONOMIC PLANNING

Even the most general type of indicative planning requires a good data base, while the more comprehensive, centralised planning attempted in many developing countries implies data requirements which frequently cannot be satisfied by the resources allocated to data collection. Thus all too often plans, however sophisticated conceptually, lack a sound statistical foundation ; consequently, they cannot be implemented or monitored in any meaningful way.

It is hardly necessary to labour this point. Economic planning is concerned with the use of a country's economic resources, and with changes in the level and allocation of those resources. Thus to formulate a plan we need to know something about the existing level and pattern of resources and the relationships between them ; including the way in which the economy has evolved over time. The national accounts provide an obvious starting point for such an analysis, though this has to be supplemented by additional information on, for example, population, fertility, participation rates, etc.

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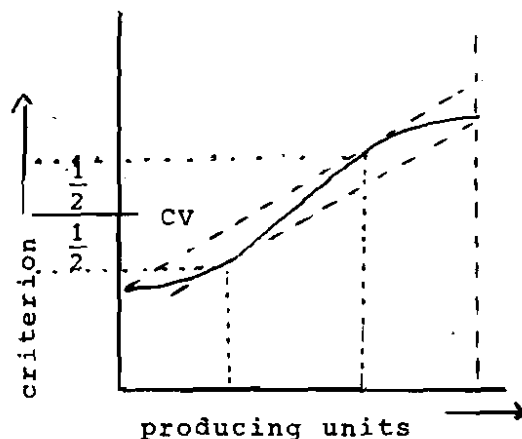
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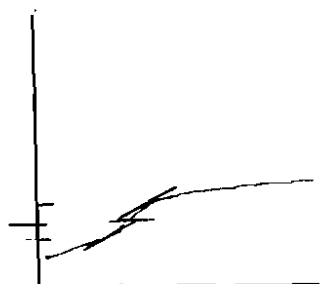
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Part II includes also an outline of the framework in which the distinction between traditional and modern activities may be applied. This framework consists of a "Basic Table" which describes the supply and disposition of goods and services and of a set of supporting accounts.

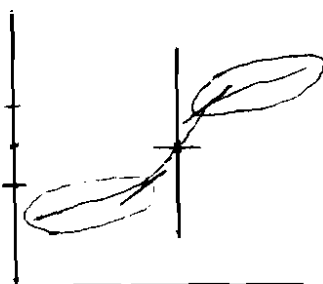
SCHEMA 4 DETERMINING THE CRITICAL VALUE GRAPHICALLY



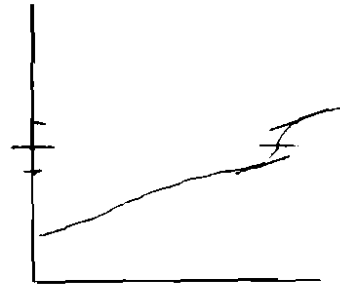
The values for the criteria or its proxy are listed by increasing size along an arithmetic scale against cumulative numbers of producing units. This gives a step distribution, the line of which can be smoothed. If the criterion or its proxy hold up, two distinct categories, one of high values, the other of low values, will become apparent; if the categories are very pronounced, the curve of the distribution will be S-shaped. The critical value (cv) which determines the sector to which a producing unit is assigned, can be derived conventionally by halving the difference between the last value which clearly still belongs to the lower category, and the first value which clearly belongs to the higher category; if the curve is S-shaped these last and first values can be determined by the tangents to the curve through its beginning and its end (excluding, of course, obvious extreme values at the two ends). (The case A,B,C show applications of this method for different shapes of distributions).



A



B



C

The basic criteria are applicable in principle to unprocessed data, that is to data when they are observed or collected. After data have been compiled, aggregated and arranged (available statistics generally consist of such processed data), the user cannot introduce new criteria. The user can only assume that certain underlying properties of the processed data will be appropriate for his uses also. Any ex-post rearrangement is constrained by these limitations. This is particularly awkward in the present study since data are to be distinguished by new criteria although they have not been collected according to these criteria. Therefore any use of existing data for such new interpretations will have to apply proxies the properties of which only approximate the ones required for the purpose.

SCHEMA 3 : THE THREE BASIC CRITERIA AND THEIR CHARACTERISTICS

Criterion	Basic characteristics considered	Measure	Proxy
organisation	division of labour	Output classified by higher or lower division of labour	Number of steps per product, or number of different operators
technology	use of sophisticated installations of standard reproducible quality	capital inputs used for producing outputs of reproducible quality	sophisticated machinery per unit of output
labour	labour intensity	total labour share including equivalent training requirements if measured simply in hours	weighted time worked per unit of output

Closing remarks : Part II of the original paper then proceeds with the discussion of proxy criteria which may be used on existing data when the above outlined theoretical criteria cannot be used because they apply directly at the data collecting stage.

This part, however, is not reproduced here and readers are referred to the original paper which may be obtained from the OECD Development Centre.

- The technology criterion classifies inputs by the type of input according to certain characteristics of the corresponding output which represent higher or lower technology input. This input would be given by sophisticated capital that enables reproduction of an output with exactly the same qualities.
- The labour criterion classifies the share of the total labour input (labour intensity) in output quantity. In principle this would be the total labour input into a process according to the cumulated sum that represents the total labour requirements for a product.

It is important that these distinctions are made in such a way that the different characteristics are discernible by the producers themselves, so that in any enquiry they can effectively establish the various categories or at least a corresponding value for a particular measure.

The results of such enquiries can then be listed according to size to produce distributions from which critical values can be determined. When the values for the respective criteria are plotted by increasing size on an arithmetic scale against the number of producing units on a cumulative scale, a step distribution is derived. A conventional distinction can be made between "high" and "low" values by halving the difference between the last value which clearly still belongs to the lower category and the first value which clearly belongs to the higher category. In cases where two distinct levels in the distribution exist the "curve" will be S-shaped ; the last and first values can be determined by the tangents to the curve through its beginning and its end. If there are no distinct levels the "high-low" distinction may not be applicable. However if it can be maintained (as it can be for all three criteria discussed in this study) a simple arithmetic average over all values could be used, or preferably the mid-point between the lowest and the highest values (excluding the obvious extreme values at both ends).

The shape of these distributions will alter from period to period which in itself constitutes an important piece of information. It also means that the resulting critical value in each of these distributions will also vary from period to period. Thus comparisons between periods will have to be made with reference to the value and situation in some base period. These comparisons will be of the same value as those for other size distributions such as of enterprises by number of employees or of incomes by income groups. The changing contents of the different categories will supply useful information on the development of the structure of the total under consideration providing the high and low values of the underlying data correspond to the criteria. This condition is necessary because the character of underlying data may change over time and space. For example in advanced countries a similar distribution may refer entirely to modern production units ; the high and low values of the same criterion cannot be interpreted as producing the traditional-modern distinction discussed here but categories that indicate the extent of modernity.



inputs need to be quantifiable in comparable units. Labour inputs are not easily measurable in comparable units since it is not just the amount of labour but its quality as well which needs to be expressed in such units. To be able to add quantities of different qualities they must first be made equivalent. It is not sufficient to have the same units since a doctor's hour is as different from a plumber's hour as is a litre of milk from a litre of wine. For this reason, equivalence scales on the basis of common characteristics for all the items of a group, such as calories for food and alcohol content for beverages, or the characteristic qualities of one item of a group, like for instance "wheat units" or "hard coal units", are used. For labour inputs no such equivalence scale has been devised. Even deflated values do not supply such an equivalence scale even in a perfect market; relative values are also the result of the scarcity of factors and not only of the actual quantities supplied.

In principle the total labour input into a product is the cumulative input of labour through all the different stages of production and in all inputs of production from other enterprises plus the training for the different activities. Now assuming on average that there are no basic differences in the duration of services during the lifetimes of individuals, the relative quantities of labour inputs are a product of different training. Thus the time required to train persons for particular activities may be considered as a basis for an equivalence scale for all labour services. Since such a scale can be objectively evaluated it is operational. The average around which the scale would be constructed will be conventional.

The measure "total labour time weighted with such an equivalence scale per total output quantity" will enable a distinction between processes requiring much accumulated labour and those where these labour inputs are low. This will be a useful distinction for several purposes, but it should in any case be made separately from the other two criteria which define the four basic sectors. The initial distinctions by organisation and technology (even if the latter also depends to some extent on the distribution and combination of labour and other inputs) enable the perception of productivity as an additional criterion rather than, as it is sometimes proposed, the primary distinction between traditional and modern modes of production.

#### 2.1.4. Application of the criteria (1).

Each of the three criteria distinguishes a different characteristic of production :

- the organisation criterion classifies outputs by the way in which they have been produced according to certain conditions which represent higher or lower organisation input; for example the number of steps carried out by different people in the production of a particular product.

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(1) See Schema 4 on page 19.

If technology is used as a quantifiable criterion, it has to be measurable in units which enable the distinction between high and low technology inputs to be made, that is in units which are open to scaling. Such quantifiable measures may be seen in those parts of input which represent technology input and these have to comply with certain conditions if the related data are to be classified into separate categories. These conditions may be derived from a certain quality of the corresponding output. Thus technology inputs have to make possible a production of output units that have identical characteristics and which are reproducible with the same inputs, that is a certain standard quality of output must be directly attributable to the use of certain inputs. What would be measured is the amount of the respective inputs into these outputs.

Such a measurement of technology input would follow in reverse order the production process. It would start with the final products, distinguishing between outputs requiring technology input and others. The next step would trace all inputs and only at the final stage would there be a calculation of the percentage shares of the respective inputs in the total input for each identified separate process. This circulation may be made indirectly by calculating it as the complement of the percentage share of the "straightforward" inputs of basic labour plus intermediate consumption, where "basic labour" may be seen as the number of persons employed valued at a representative average price for manual labour. This measurement is operational in as much as with appropriate instructions the required information can be supplied directly by any production unit, that is the producer himself can answer the question without any intermediary interviewer.

### 2.1.3. Labour

The combinations of the first two criteria produce four sectors ; any additional criterion only subclassifies these four sectors, it does not identify new sectors. Such a criterion is the third input considered here, namely that of labour. This input represents the labour intensity of a production process, where "labour intensity" is the share of "properly weighted" labour in total output. It is often used as an analytical measure such as for measuring productivity, although the output of labour can hardly be seen separately from that of other inputs ; but this argument obviously works both ways. To consider labour inputs next is arbitrary ; for certain purposes other subclassifications may be of equal or greater importance. But there is a certain logical sequence since labour is to a large but limited degree complementary to capital.

The fact that the input of labour is the complement of the input of technology only to a certain extent is because not all inputs other than labour represent technology. The input of labour measures the participation of persons in the process of production ; but to distinguish high and low labour inputs, these

Measurement by the types or mix of inputs may be necessary in the case of services where the product is linked to goods which are not changed by the service. For example in trade the same product may be sold by a variety of processes such as over-the-counter, self-service or mail order. Each of these require different inputs and usually different personnel. Measurement could be made in terms of percentage shares of the inputs that differ from those of the "original" organisation ; this would require a classification designating their correspondence to high or low organisation input. Such an approach would be particularly applicable to different categories of personnel.

### 2.1.2. Technology

Technology input is the other basic criterion. It measures the extent to which factors apart from manual or animal labour enter into the production process. Since organisation is being measured separately, technology refers to the degree of sophistication of capital. In its widest sense this would encompass installations and human capital, but so far there is no general consensus about the measurement of human capital.

Technology input is the second criterion because it can be applied to both of the primary distinctions of high and low organisation ; each of these can be subdivided into sectors with high or low technology input. In many instances high organisation and high technology inputs take place simultaneously, but there are circumstances where only one of these factors prevails. In fact the fully traditional sector (where both factors are low) and the fully modern sector (where both factors are high) could probably be identified even without a selection by basic criteria. However for the other two sectors the category to which they belong is not clear in many instances ; without the two basic criteria together they could easily become mixed up if based on one or other of the criteria alone.

Low and high technology inputs may be seen in the way in which a process is carried out, for example from the extent of mechanisation. But such an approach would represent a measure of the degree of mechanisation of the procedure and not of the technology input as such. Technology input should be measurable by factors of production other than basic labour, non-sophisticated capital or consumption of raw materials. These other factors of production include all inputs that are not subject to further processing and enter into total output cost just as capital costs do ; as such they may be considered as "quasi-capital". "Technology" in this context is the input of all types of capital irrespective of their relative qualities that result from their form, origin or age. Any distinction other than the one (relatively high or low technology input) already made is left to subsequent analysis ; no matter how desirable (1) further distinctions cannot be made without additional criteria.

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(1) See /14/ p. 141, 142.

### 2.1.1. Organisation

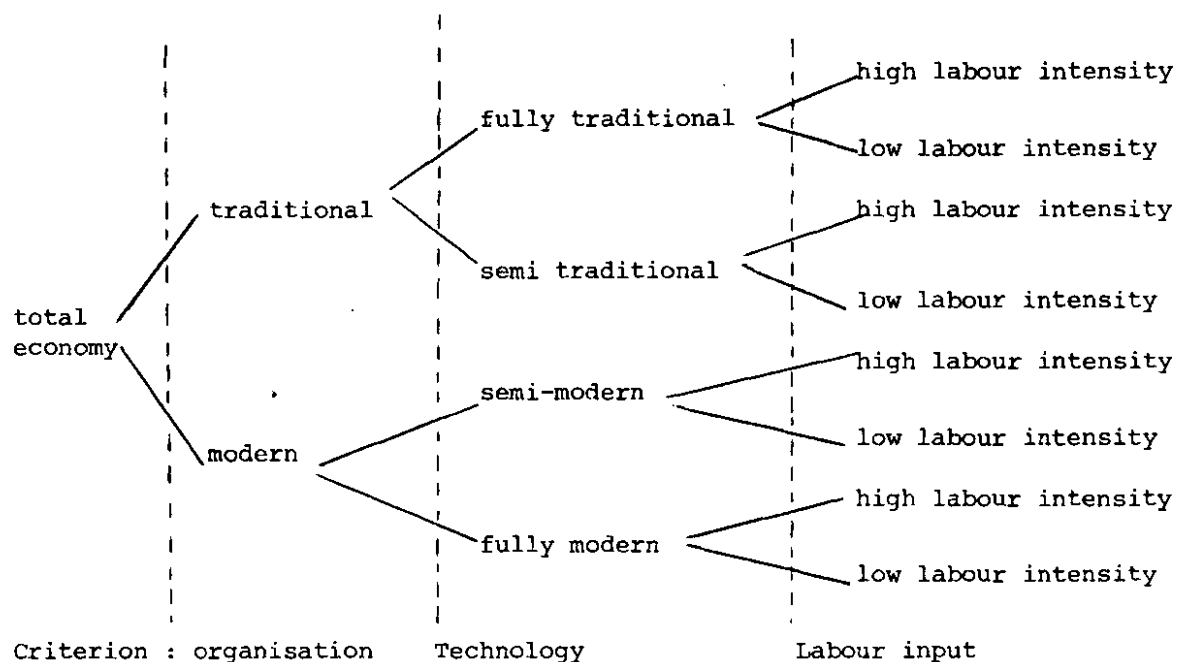
The organisation input is the first basic criterion which determines the mode of production. Different modes of production can be distinguished by the way in which production is organised. Organisation usually manifests itself through deliberate efforts to arrange the process of production in a particular way. The presence or absence of such efforts can thus be considered as high or low organisation input. To be able to make this criterion operational, the effects of these efforts have to be observable. Such observable effects may be reflected in the method by which output is produced. A process could be called "traditional" if output is produced by methods used previously. To rely entirely on such a test would probably be incorrect since undoubtedly a number of processes with high organisation input exist in historical activities.

Organisation as a quantifiable criterion must then be measured another way. Quantifiable measures may be seen in those parts of output which have been produced under conditions representing higher or lower organisation input. Hence distinct parts of output produced under different conditions have to be classified. These parts may be classified by their production process or, if this is not feasible, either by the characteristics of the parts of output themselves or by the qualities of the labour or capital inputs used in their production. Depending on circumstances each of these can represent high or low organisation input.

Production processes are organised differently so that varying levels of organisation may be distinguished. It is from this basic distinction that a more independent meaning of "organisation" and particularly of "modern organisation" is derived. "Modern organisation" is one which represents a higher amount of organisation input which usually results in more efficient production. In other words this is the assembly line effect which, through a division of a production process into a number of small steps and by having the same steps repeated by the same labour, enables a more efficient arrangement of all inputs as compared with the same labour carrying out each step successively. The amount of organisation input normally increases as the number of steps introduced into a production process becomes larger. Measurement may be given by the number of steps carried out by different persons or by the number of persons carrying out different steps in the production of a particular product.

In production statistics where an enterprise produces the same type of products but not by the same procedures, each output should be registered as being produced by a different unit or establishment ; often they are not. In some such cases where it is not possible to measure separately all outputs according to the way they have been produced, it may be necessary to resort to direct comparison of the products themselves, observing differences in their characteristics to determine the type of production process used and the organisation input involved. The relative shares in total output may then be gauged for each part of output ; classification of the enterprise being dependent on the dominant share.

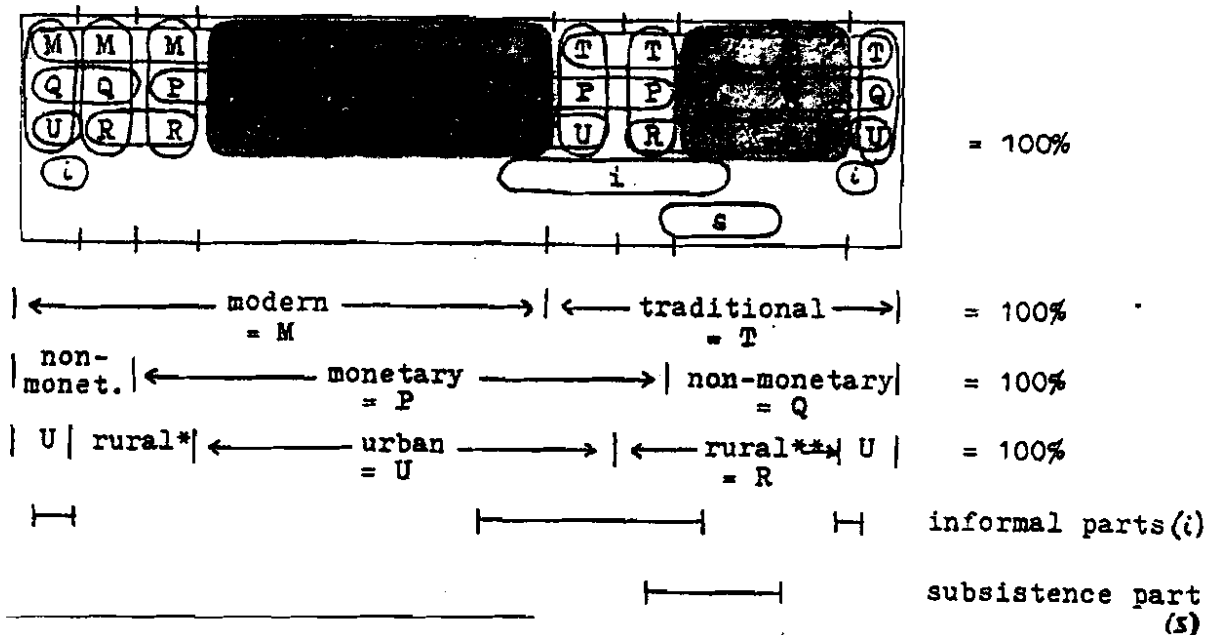
SCHEMA 2:SECTORS, CATEGORIES AND SUBCATEGORIES



The intention in this study is to use the two criteria of organisation and technology together to establish four sectors ; the categorisations based on the third criterion are considered as subdivisions of these sectors. Hence if low and high organisation inputs are cross-classified with low and high technology inputs, four sectors emerge labelled "fully traditional", "semi-traditional", "semi-modern" and "fully modern". In this way the demand for distinguishing those intermediate categories which are neither completely traditional nor wholly modern is met.

The three criteria are operational in that for each one low and high values can be observed for economic production units and so enabling a classification of these units into one of the categories. The calculation of high and low values for the criteria is described in greater detail later in this section. What needs to be stressed here is that the respective combinations of the criteria serve only to facilitate decisions about the category in which a production unit belongs and thus the category in which all data for the unit is to be assigned.

SCHEMA 1 GRAPHIC COMPARISON OF DIFFERENT DUALISTIC TERMS  
AND THEIR OVERLAPPING



x = large farms and modern rural enterprises.  
xx = small farms and rural traditional enterprises.

Note : The two large shaded areas are the ones which cover similar elements of the three pairs, and which probably are the ones that are usually referred to and in fact are the same for the three pairs ; but there exist also six other combinations of elements of the same pairs, which are normally not mentioned.

## II - CRITERIA

## 2.1. Basic Criteria

One criterion is required for distinguishing two categories, two criteria for four categories, and three criteria define eight categories. Accordingly with three criteria the two main sectors ("traditional" and "modern") can each be divided into two subsectors ("fully" and "semi") and each of the resulting four categories can be divided into two subcategories ("high labour intensity" and "low labour intensity"). The three criteria are organisation, technology and labour inputs.

will, however, not give rise to a clear-cut dualism, since only purely traditional activities will mostly be labour-intensive, whereas for activities of mixed character this is not generally so, so that this distinction does not constitute a criterion for distinguishing between all traditional and all modern activities. Actually, the share of factors in the two kinds of activities varies over time and space for both traditionally and modernly organised activities. High and low capital intensity therefore can be used to distinguish two sub-categories of a given category ; however, the point made in this study is that the category to be divided in this way is not the general economic total of any activity but (each) one of the categories already singled out as either "traditional" or "modern" (by the organisation criterion), being only subdivided further by the capital intensity criterion. In fact, this criterion is here narrowed down to "technology input" which refers only to a specified part of the total capital input.

#### 1.3.4.5. "low-high productivity" (distinction by output per input factor)

Labour productivity, seen as the output per unit of input, will, in principle, but not necessarily, be high in fully modern production processes and lower in traditional processes of production for same or comparable goods (and services). Accordingly, it is sometimes proposed to use productivity as a criterion for distinguishing between traditional and modern activities. Apart from the fact that, if at all, this could be made only where a systematic comparison of related processes is possible, i.e., normally, only for the same kind of goods and services, such a distinction would not yield dualistic categories. A simple distinction of two sub-categories of any category does not already constitute a "dualism", as already outlined in the general discussion above. Different productivity may therefore coincide with the distinction of a particular dualism, in particular the traditional-modern one ; however, the productivity criterion will in no case correspond with or apply to the entire dualistic categories, so that it would not be a valid criterion for distinguishing those categories. On the other hand, in certain instances, i.e. where the identity with a certain category is obvious, it may, therefore, serve as a proxy for the required basic criterion, if corresponding measures are not available.

But even when it can be assumed that "small" establishments use less organisation and technology per unit of output, it still remains to be established which sizes are to be considered as "small" - which in fact may vary from branch to branch and from country to country. Where certain characteristics of establishments coincide with certain sizes, and if these characteristics are divided into distinct kinds, dividing lines will be discernible from current statistics by a size distribution which should show definite frequencies for the different kinds - or else there is no clear-cut distinction, and size is not a useful proxy.

However, a size distribution requires a relatively fine detail, and countries often tend to collect data only by large groups. India, for instance, uses categories of "less than 20 employees", and also of "less than 10 employees (with additional criteria)" ; the SNA proposed a category "engagement of less than 5 persons" ; and Kenya uses the categories : "1-4", "5-19", "20-49", and "50 and more" persons engaged. But in most cases the original data are available by actual numbers, so that only appropriate listing is required. Once the importance of such listings has been recognised, there may be quick progress in all those cases in which size distributions would supply useful (proxy) criteria.

#### 1.3.4.3. "Poor-rich" (distinction by income distribution)

Some authors (1) have proposed to make also a distinction - or they have at least used this distinction for their arguments - between data concerning the "poor" and data concerning the "richer" strata of the population or of households. In fact, "some components of the definition of the informal sector are important features of occupations accessible to the poor . But the informal sector cannot only be identified with the... poor"(2). On the other hand, the "poor" category is closely interwoven with the traditional, the non-monetary, and the informal sectors, so that, if it is considered important to show it separately, it requires separate statistics or, at least, corresponding sub-categories. In any case, it also cuts across the sectors outlined so far, and this distinction is not by itself sufficient to separate the whole economy as by organisation, technology, or labour content.

#### 1.3.4.4. "Labour-intensive - capital-intensive" (distinction by factor inputs)

In fact, still another distinction may be considered by the capital and the labour intensity of an activity. This

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(1) e.g. Mukherjee, Choudhury and Rao /21/, p. 447 ;  
Chenery and Duloy /7/, p. 184 ;  
Powelson/23/, pp. 130, 133, 134 ;  
Seers /26/, p. 13.

(2) D.C. Rao /24/, p. 137.