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**RESULTS OF THE SURVEY ON SOFTWARE AND  
MODULES USED IN THE COMPILATION OF  
NATIONAL ACCOUNTS**

# CONTENTS

	<u>Page</u>
A. Introduction .....	1
B. The place of national accounts in the computerization of national statistical services.....	1
C. Results of the survey.....	3
C1. Layout of the questionnaire.....	3
C2. Analysis of the responses:..... overview of the computing tools used in national accounting operations	3
D. Other sources of information.....	6
E. Concluding remarks.....	7
F. Recommendations, and the role of Economic Commission for Africa.....	8
G. Annex	
H. Bibliography	

## **A. Introduction**

1. As a result of the economic programmes put in place in Africa, and in particular, the structural adjustment programmes, the demand for statistical information has assumed a short-term perspective. Few African countries were ready to meet this demand, owing to the steady reduction of human and financial resources committed to national accounting systems. Consequently, national accounts are often published late, and in some cases, irregularly and piecemeal in response to occasional requirements, usually from donor circles and confined to the gross domestic product and its breakdown by expenditure.

2. National accounting systems are also hampered by a number of other factors, particularly in the following areas:

- Staffing: accounting professionals gravitate to more lucrative occupations owing to lack of recognition or motivation;
- Methodology: when there is no reference document that can be used as a concrete standard for national accounting and arbitrage operations; calculations; and
- Consistency in statistical series: when there is a shift of basis, or when there is no data to evaluate certain items in an account or table.

3. Consequently, the computer has become an essential tool for statisticians whether or not they are also well versed in information technology. It has facilitated improvements in accounting systems and presentation, making it possible to meet various needs promptly. In particular, data can be processed and disseminated more quickly; there is a larger capacity for data storage and management; and methodological consistency is achievable.

4. Against that background, the Conference of African Planners, Statisticians and Population and Information Specialists, within the framework of statistical development activities in Africa, gave the Economic Commission for Africa (ECA) the mandate to conduct a survey of software and modules used in the computerized compilation of national accounts in Africa, with a focus on assessing the degree of penetration of computerized statistics and, in particular, the level of automation in national accounting.

5. The present document examines the salient developments in the process of computerization of national statistical services, and in particular, national accounts. It contains a comparative table of software and modules used in Africa in national accounting systems, as an aid to the choice of tools and in the perspective of a common platform and/or some degree of compatibility among those tools.

<h2><b>B. The place of national accounts in the computerization of national statistical services</b></h2>
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6. The main functions of micro computing in statistical services are reducible to two broad categories:

- overall automatized management of statistical services and activities, such as surveys, and statistical data files used in generating information, as needed, for the production of bulletins, catalogues and other statistical publications;
- automatized management of statistical data proper, including extraction, checking, tabulation and keyboarding, as well as the processing of composite data for day-to-day statistical purposes such as national accounts and the compilation of national accounts summary tables (e.g. TES, TOF, etc.).

7. Micro computing in national accounts necessitates technologies that are fairly complex, and a broad spectrum of competencies, to translate concepts and processes into machine language, and to facilitate highly accurate calculations, which improves accounting quality and enhances regularity of publication. Hence, adequate data processing is congruent with the essential strategic choices designed to facilitate statistical operations in general, and national accounts in particular; this is relevant, too, from the standpoint of the users of the accounts.

8. Until recently, however, few of the standard software programs or modules were especially adapted to national accounting. In general terms, three characteristics are observable in the penetration of computerized national accounting. There have been, firstly, examples of passivity and rigidity in the use of computer programs, with no modifications. This has resulted in a limited scope of application mostly suited to non-computer experts and non-national accountants who are mainly engaged in preprogrammed keyboarding operations. The second example is characterized by the use of commercial programs and/or software to construct data files the use of which is either confined to those tools or transferred for use in other software – usually spreadsheets. There are, lastly, examples where programs, software and/or modules are adapted to the specific requirements of national accounting, with the use of highly developed operating systems. Such a system requires a higher level of computing and accounting expertise, to properly interpret the various procedures of compilation of accounts and of arbitrage.

9. Of the above-mentioned examples, the first two are more widespread, owing mainly to the level of computing expertise among statisticians engaged in national accounting, and the degree of complexity of the calculations involved, which often require costly checking procedures. In both cases, computers are used in the management of basic statistical data, in the compilation and storage of data, and in the arrangement of data into tables that conform with the system of national accounts. These functions explain the preponderance of spreadsheets (such as Lotus 1-2-3; QuattroPro, Excel, etc.) and of simple data base management systems (such as Dbase, Paradox, Access, etc.).

10. The development of micro computing, and progress in capacity, processing speed and memory is a turning point towards more widespread use of micro computing in national accounting operations. Thus, the situation where national accountants and computer specialists operate in different milieux need not continue. The organization and management of national accounts compilation operations can be both centralized at the level of the team leader and distributed to different workstations.

### C. Results of the survey

11. For the purposes of the survey on the use of micro computing in national accounting operations in Africa, a questionnaire was sent to 53 member States of the Commission, in September 1998. Following a reminder sent out in January 1999, 23 responses were received, which represents a response rate of 43 per cent. The breakdown of responses by subregion is as follows: North Africa, 2; West Africa, 7; Central Africa, 2; Eastern Africa, 5 Southern Africa, 7.

#### C.1 Layout of the questionnaire

12. The questionnaire is divided into five main parts, dealing with the following areas:

- accounts compilation system  
(Manual or computer-assisted)
- type of computers, software and modules used;
- staffing (volume, and level of expertise);
- Type of accounts and tables drawn up (characteristics and no. of years); and
- Problems encountered in the use of software and/or modules (time taken to train national staff, degree to which needs are met, "user-friendliness" and development prospects).

#### C.2 Analysis of the responses

13. The overview of programs, software and modules in use is focused on the following elements: language; functions; linkages among various conjoint programs; input-output data files; the required calculating environment, i.e. the specifications and configuration of the computers used, including the operating system, coordinates and designers, conditions of acquisition and maintenance. Following is a breakdown of the responses.

##### Accounts compilation systems

14. A majority of the respondents affirm that they do use microcomputers in their national accounting operations. Within this group, 53 per cent have systems of national accounts that are wholly computerized, on microcomputers, while 43 per cent of the remainder have systems that are partially computerized. The remaining 4 per cent still rely on manual.

##### Type of equipment

15. In only one of the countries that responded to the survey is mainframe still used. The others use personal computers (PCs), with 386,486 processors and Pentium. In only 30 per cent of them are the PCs networked. The workstations in the remaining 70 per cent operate separately. To a large extent, the equipment has been acquired in the form of grants, either directly by way of bilateral arrangements, or as the culmination of census projects and budget-consumption surveys. There are very few cases of direct acquisition from national resources.

### The software and modules used

16. None of the countries covered has a complete module in place for the comprehensive compilation of national accounts. However, data storage, macro-computations and tables are processed on EXCEL, LOTUS 123, DBASE and QUATTRO PRO software. To a lesser extent, PROGRESS and ACCESS are used. Windows appears to be common. There is a fairly wide variety of applications, including keyboarding of basic data, external trade, balance of payments, corporate and quasi-corporate accounts, accounts of government departments, input-output tabulation, appropriation tabulation and, on occasion, public-sector financial operations.

17. At present, expatriate personnel are relied on to construct the modules. This usually means that the user-country is dependent on external aid in that form. In such cases, the length of the expatriate expert's stay can determine the longevity of a programme. There are other constraints, notably the long duration of training programmes for in-country staff, and the time they take to acquire an adequate grasp of the modules. (This ranges from a few months to several years, depending on the level of complexity of the module and the degree to which the national accounting personnel are conversant with computing). There is the problem of high installation and maintenance costs, and inadaptability vis-à-vis local realities, as a result of poor quality, limited supply and lack of consistency in the profile of basic data.

### Staffing: volume and level of expertise

18. In the main, the staff working with these tools are statisticians, with few economists and hardly any computer experts. The number ranges from three to 13, in the case of in-country personnel (on average, three are highly qualified professionals, and five are middle-level), while there is usually only one expatriate engaged on a full-time basis, and in some cases, none at all. There are, in addition, consultants engaged for a limited duration to help instal and maintain software and/or modules.

### Type of tables, accounts and aggregates compiled on the modules

19. These are similar to those mentioned above, namely input-output tables, appropriation tables, corporate accounts, production accounts, external accounts, and the main aggregates featured in series which vary in duration from five to six years.

### Degree of satisfaction with the software and modules

20. The use of micro computers in national accounts has the following advantages:

- it is a "user-friendly" tool, so that, with some initiation into the operation of the equipment, software and modules, a non-computer expert can use it;
- it facilitates data management, particularly through efficient mechanisms for the circulation and storage of data and arbitrage, where standardized presentation is required in the form of data files; and through a system of codification that indicates, in respect of

a given item, its position in the system, when it was established, the author, and a cross-reference;

- it facilitates memory of data, thus ensuring continuity over time, by means of the building-up and maintenance of archives through the managed erasure of some of the documentation and data files, and as an aid to updating operations and retrieval as needed;
- it reduces operational costs;
- it facilitates the transfer of data and software from machine to machine, by means of systemic standardization;
- it facilitates the integration of large bodies of data into statistical information systems and the systematic internationalization of records of the quality of data. Thus, computing offers vast capacities for the storage of basic data and accounting equations contained in tables which are essential for arbitrage between conflicting sources and considerably hasten the processing of data.

21. The two last-mentioned aspects are essential because the methods employed have to be documented so that they can be scrutinized, if need be, or critically reviewed as a whole.

22. The software and modules covered appear to meet the needs of users, in terms of the present quality, the volume of the basic data, the time taken in publication, and the results of the accounts realized. The main consideration here is the computation of baseline GDP indicators, appropriation tables, input-output tables, and institutional accounts.

Problems encountered: constraints and bottlenecks in the utilization of information technology in national accounting operations

23. Two main constraints were identified: (i) rigidities in some of the software and modules, necessitating a fairly high degree of detail and structuring, which hampers the compilation of rapid-release accounts with minimal data content, and (ii) lack of financing to renew user contracts with designers.

24. There are, in addition, the following constraints:

- inefficiency in the public-service structures;
- limitations in the useful life of software and equipment, and the need for updating, which inflates costs and hampers cost control operations (i.e. high costs, the rapidity of changes in technology and absorption capacity, and time limitations for the purposes of amortizing investments to suit the available tools to national accounting operations);

- lack of coordination within the material technical assistance apparatus and in terms of technical know-how to apply such assistance effectively. This necessitates closer cooperation among donors to ensure that the technologies used correspond to the needs and actual conditions obtaining at the level of the statistical services.

**D. Other sources of information**

25. Owing to the low level of coverage realized in the survey, the study had recourse to other sources as well, namely, the Economic and Statistical Observatory for sub-Saharan Africa (AFRISTAT) and the Statistical Office of the European Communities (EUROSTAT).

**AFRISTAT**

(Economic and Statistical Observatory for sub-Saharan Africa)

26. An AFRISTAT survey on the capacities of the statistical services of its member States reveals the following range of microcomputers in use by them: 386, 486 and Pentium PCs, Word software, Lotus, Excel, Quattro-Pro, Dbase, Ariel, IMPS, Trace, SPSS, etc. These tools can be used for operations that are directly (and occasionally, indirectly) linked to national accounting operations, balance of payments, external trade and economic indicators in general, among others.

27. Three of the AFRISTAT member States use the ERE/TES (resources-outlays/input-output tables) modules developed at the University of Lyon's CREPFI laboratory, with assistance from the European Union and the French cooperation ministry, in collaboration with the Institut national des la statistique et des études économiques (INSEE). Feasibility studies were conducted in some countries, while a module simulation was realized in a non-member of AFRISTAT.

**EUROSTAT**

(Statistical Office of the European Communities).

28. A meeting on modules used in the compilation of national accounts was organized by EUROSTAT in Luxembourg (May 1998). The annex to the report on that meeting features five modules designed for the compilation of national accounts in developing countries. These are: ERE/TES, IAS-96 (the last-named being the Integrated Accounts System), SNA-NT (System of National Accounts Application Software for Windows NT), SNAPC (System of National Accounts on a Personal Computer) and UNSNA (United Nations System of National Accounts, a systems approach to national accounts compilation)<sup>1</sup>. These modules were developed, respectively, in France, the Netherlands, Norway, Sweden and the United Nations Statistical Division.

<sup>1</sup> For details regarding the various modules, see the document, 'National Accounts Support Software Packages for Developing/Partners Countries Descriptive Part of the Comparative Table'. EUROSTAT, October 1998



29. Apart from SNA-NT, all the modules operate on PC Windows 95, using the EXCEL and/or LOTUS format. The main advantage with these modules is that they are equipped with the System of National Accounts 1993 (SNA 1993) common program.

30. In the design of the modules, national accounts staff had the benefit of collaboration with experts in informatics for ERE/TES, SNAPC and UNSNA, specialists in modeling and social and economic statistics for IAS-96, and information technology specialists for SNA-NT, which enabled them to acquaint themselves with the complexities of the Windows NT system.

31. At present, only UNSNA is available in English, Spanish and Portuguese; the French version is expected to be ready during 1999. IAS-96, SNA-NT and SNA-PC are available in English only. ERE/TES is programmed in French, though the English version should have been out towards the end of 1998; the Portuguese and Spanish versions can be obtained on demand.

32. Training facilities in the use of the various modules, in informatics for the supporting basic data management systems (PROGRESS, in the case of ERE/TES), and directly in national accounts (SNA 1993) are available in the countries where the various modules were designed.

33. To-date, in terms of breadth of coverage, UNSNA is the most widely used (seven countries), followed by IAS-96 (six countries). In the Africa region, ERE/TES heads the list (four countries, namely, Cameroon, the Central African Republic, Côte d'Ivoire and Ghana), followed by SNAPC (three countries, i.e. Namibia, South Africa and Swaziland) and UNSNA (two countries: Angola and Mozambique). At present, there is no IAS-96 or SNA-NT coverage in Africa.

#### E. Concluding remarks

34. Inevitably, the trend will be towards a surge in the ever-wider usage of these tools, resulting in further development of compilation methods and higher quality in the arbitrage operations and processes employed. At every stage of development, greater sophistication is realized in national accounting operations, in terms of concepts, methods and processes as well as the frequency of arbitrage operations and synthesis. None the less, these developments should not be to the detriment of national accounts personnel, or lead to the reduction of the pertinent procedures to "an algorithmic approach to the resolution of contradictions". It should also be a means of resolving communication bottlenecks among different workstations and with the databases used for the various operations.

35. There are obvious technological and financial constraints, not least of which is the low level of development of statistical structures in Africa, which will have an impact on the above-mentioned developments as well as on the modernization of national accounts compilation systems. The challenges that will be faced in introducing information technology in national accounts compilation should facilitate further development of data gathering, processing and dissemination, and the realization of economies of scale over time. These challenges should also facilitate the networking of operations, and the commonality of rules and procedures.

36. In view of the need to develop national accounting operations, some countries have shown an interest in the possibilities offered by other modules used in the developed countries for accounts compilation purposes, both within their own subregion and farther afield. The environment also appears to be propitious for the adoption of the modules developed in France (ERETES), Norway (SNA-NT), and Sweden (SNAPC), with the spreadsheet interface standardized to MS-EXCEL. The last-named appears to be the most viable, because the use of SNA 1993, which details the basic design of the modules, is more or less universal. On the whole, these products require minimal adaptation or transformation of the systemic configuration. They have been tried and tested in the pioneering countries, and pooled utilization should therefore reduce the costs of installation. The main bottleneck is in the area of cost of acquisition and maintenance, which necessitates coordination in the interventions of partners in the computerization of national accounting operations.

#### **F. Recommendations**

37. Three of the five modules currently available internationally are used in Africa. Human-resources and financial constraints, compounded by variations in statistical traditions, may jeopardize the process of modernization of accounting systems.

38. One ideal solution would be the adoption of a standard module for all countries. Owing, however, to disparities in the level of development of the various statistical services, preference has been given to the use of the currently available modules while conducting compatibility studies with a view to the development of interface among them, in terms of programs as well as language. This could facilitate not only the harmonization of accounting operations, but also the training of national accounts practitioners and users, as well as data gathering at the subregional, regional and global levels.

39. The range of choices is all the more germane because of the prospect of affording national accounts personnel throughout the region, and users of national accounts, more opportunities to benefit from regional and/or subregional workshops for the purposes of demonstration and training in the use of modules, and the opportunity to update national accounts expertise on a continuous basis. The pertinent considerations will necessarily be related to issues such as the ease of acquiring knowledge of the use the module, the capacity of the module as an aid to the entire accounts compilation process, the flexibility of the module in terms of adaptability to local conditions, its compatibility with other modules, and the extent to which costs of acquisition and maintenance can be borne by the national budget.

#### **The role of ECA**

40. The role of the Economic Commission for Africa would be to (a) firstly, conduct in-house training, (b) regularly update member States on the existence, availability and development of modules, (c) ensure coordination in the adoption and installation of modules in each country, (d) provide technical assistance and technological expertise, particularly for current problems such as the millenium bug, which makes it necessary for national statistical services to put in place contingency plans to guard against the risk of interruption of external data supply mechanisms or their own electronic supply channels. These imperatives, like the very process of accounts compilation,

requires time, the continuous availability of staff, and resources. It could therefore constitute the national accounts component of a regional programme for statistical development in Africa.

G. Annex  
Table 1:

Results of ECA survey on the use of micro computers in the compilation of national accounts

Item in questionnaire	Angola	Benin	Cape Verde	Côte d'Ivoire	Djibouti
<b>Method</b>					
Manual					
Computerized	X		X	X	
Both		X			X
<b>Mode</b>					
Networked					
Separate	X	X	X	X	X
Software	Quarto, Excel	Lotus 123, Excel	Excel, Lotus 123, Windows	Excel, Dbase, Access, Word, Progress	Dbase, Excel
<b>Module</b>	UNSNA			ERETES	
Applications in which software and modules are used	Institutional accounts	Sectoral accounts, ERE, TES, TEE		ERE, TES, Keyboarding SAP, COMEXT	External trade, GDP by origin and distribution
Problems encountered				Staff mobility	
Future prospects	Excel to be installed '97	Acquisition of ERETES			Installation of EUROTRACE

Table 1 (cont'd)

Item in questionnaire	Gabon	Madagascar	Mali	Mauritania	Niger
<b>Method</b>					
Manual					
Computerized	X		X		
Both		X		X	X
<b>Mode</b>					
Networked					
Separate	X	X	X	X	X
<b>Software</b>		Excel, Word, Access	Excel, Lotus	Excel, Access, Windows, Publisher 97	Excel, Lotus, Word
<b>Module</b>					
Applications in which software and modules are used	TEE, TES, ERE Sectoral accounts	BDP, ERE, TES	BDP, TES, ERE, External trade, price, Economic indicators	GDP computation. Publication of results, Terminologies	National accounts, corporate statistical reports
<b>Problems encountered</b>	No explanation of methodology, training takes too long, lack of flexibility		Adequate training	Training in Access software problematic	
<b>Future prospects</b>	ERETES to be adopted		New software and modules to be acquired	To acquire ERETES module	To acquire ERETES module

Table 1 (cont'd)

Item in questionnaire	Senegal	Chad	Tunisia	Botswana	Kenya
<b>Method</b>					
Manual					
Computerized	X	X	X	X	X
Both					
<b>Mode</b>					
Networked	X		X	X	X
Separate		X			
<b>Software</b>					
	Excel	Lotus	Excel, Access	Cobol	Excel
<b>Module</b>				SNAPC	
	Agreg				
Applications in which software and modules are used	SQS, AP, IF accounts Consolidation, TES, TEE	BDP, TES, ERE, TOFE, VA by industry and sector corporate accounts	TES, ERE, Institutional accounts, TEE, TOF	GDP computation Revenue accounts Capital accounts	GDP, CNP, FBCF accounts
<b>Problems encountered</b>		Lack of motivation and financial resources		Limitations arising from the fact that it is above all, a spreadsheet, and not really a data processing system	Programming aspect yet to be fully mastered
<b>Future prospects</b>	ERETES to be installed	ERETES to be installed	In contact with EUROSTAT for ERETES installation	Linkage between SNAPC and ERETES envisaged	

Table 1 (cont'd)

Item in questionnaire	Malawi	Mauritius	Namibia	Nigeria	Seychelles
<b>Method</b>					
Manual					
Computerized	X		X		
Both		X		X	X
<b>Mode</b>					
Networked			X		X
Separate	X	X		X	
<b>Software</b>	Excel Lotus	Excel	Excel, Word	Excel, Lotus	Lotus, SmartSuite
<b>Module</b>	Naup DATE, Macsol		SNAPC		
Applications in which software and modules are used	Production accounts, Revenue accounts, BDP	National accounts and tables (1968 version)	GDP by sector and distribution, Disposable revenue and savings	GDP by distribution, disposable national income, TES and other aggregates at current and constant prices	TES, ETE and other tables
<b>Problems encountered</b>	Training takes too long not enough computers	Process yet to be fully automated			
<b>Future prospects</b>	SNAPC may be used depending on availability of a microcomputer with large enough memory				Interest in using ERETES module, and in information about other available modules

Table 1 (cont'd)

Item in questionnaire	South Africa	Swaziland	Zambia
<b>Method</b>			
Manual			
Computerized	X		
Both of the above		X	X
Large computer	X		
<b>Mode</b>			
Manual	X		
Separate			X
<b>Software</b>	MS Office, PC SAS	Excel	Lotus, Dbase, SAS, WP 6.1
<b>Module</b>		SNAPC	
Applications in which software and modules are used	Quarterly GDP calculation	GDP computation, by distribution. Compilation of FBCF tables	TES, other accounts
<b>Problems encountered</b>			Inadequate training
<b>Future prospects</b>	Modules developed in France and Norway (ERETES and SNAPC) now being evaluated.		SPSS, Excel, Visual Basic and Access software under consideration, subject to adequate training being available

Source: ECA survey



Table 2  
Comparison of modules used in national accounts computation in developing countries

A. Available range	ERE/TES	IAS-96	SNA-NT	SNAPC	UNSNA
1. Main features					
1.1 Basic design					
1.2 Priorities in national accounts computation	SNA 1993	SNA 1993	SNA 1993	SNA 1993	SNA 1993
	Balance of goods and services	All accounts	Balance of goods and services	Current accounts	Industry and sector
2. Accounts and main aggregates compiled					
2.1 Goods and services/final expenditure, external trade balance at current prices	Yes	Yes	Yes	Yes	Yes
2.2 Goods and services/final expenditure, external trade balance at current prices	Yes	Yes	Yes	Yes	Yes
2.3 Production accounts/GDP, value added at current prices	Yes	Yes	Yes	Yes	Yes
2.4 Production accounts/GDP, value added at current prices	Yes	Yes	Yes	Yes	Yes
2.5 Income accounts/GDP, through income approach	Yes	Yes	Yes	Yes	Yes
2.6 Other income distribution accounts/disposable income by sector	Database	Yes	Early 1999	Yes	Yes
2.7 Income shares/savings by sector	Database	Yes	Early 1999	Yes	Yes
2.8 Capital accounts	Database	Yes	Early 1999	Yes	Yes
2.9 Financial accounts	Database	Yes	Early 1999	Yes	Yes
2.10 Other asset transfers/Net value transfers by sector	Database	Yes	Early 1999	No	Yes
3. Balance/Integration					
3.1 GDP: supply and disposition	Yes	Yes	Yes	Yes	Yes
3.2 Supply and disposition by product	Yes	Yes	Yes	Partially	No
3.3 Capacity/Financing requirement, by sector	Database	Yes	Early 1999	Partially	Yes
3.4 Matrix presentation, other multiple classification	Database	Yes	No	Partially	Yes
4. Other SNA tables and statistics, satellite accounts					
4.1 Balance sheet	Database	Yes	End 1999	No	yes
4.2 Population and employment statistics	Yes	Yes	Partially	No	No
4.3 Social accounting matrix	Database	Yes	No	No	Partially
4.4 Satellite accounts	No	Yes	Tourism	No	Partially

Table 2 (cont'd)

	ERE/TES	IAS-96	SNA-NT	SNAPC	UNSN A
<b>B. Advantages of the program</b>					
<b>1. Processing methods</b>					
a) SNA 1993 tabulation nomenclature	Yes	Yes	Yes	No	No
b) Pre-established, flexible tables/spreadsheets	Yes	Yes	Yes	Yes	Yes
c) Automatic transfer on networks	Yes	Yes	Yes	Yes	Yes
d) Systematic interface and variations	Yes	Yes	Yes	Yes	Yes
e) Automatic updating of ratios	Yes	No	No	Yes	No
f) Automatic updating of indices/growth rates	Yes	Yes	Yes	Yes	No
g) Automatic calculation of balances	Yes	Yes	Yes	No	No
h) Separate data base system	Indirect	Yes	Yes	...	...
i) Temporal items in the data base	Yes	Yes	Early 1999	Yes	Yes
j) Accounting tables publication materials					
<b>2. Additional support to the user</b>					
a) Pads for remarks	Yes	Yes	Yes	Yes	No
b) Connection/aid memoire on national accounts-related problems	Yes	For 1999	No	Yes	No
c) Notation of changes in the data	Yes	Yes	Yes	No	No
d) Compilation status displayed	Yes	No	No	No	No
<b>3. Coverage of data base</b>					
a) Supply and disposition accounts	Yes	Yes	Yes	...	...
b) Integrated economic accounts	Yes	Yes	Early 1999	...	...
c) Other SNA 1993 tables	Yes	Yes	No	...	...
<b>4. Type of data base</b>					
a) Data in national accounts format (nomenclature, concepts)	Yes	Yes	Yes	Yes	Yes
b) Adjusted accounts (disaggregates, complements)	Yes	Yes	No	Yes	Yes
c) Raw data from primary sources (aggregates)	Yes	Yes	No	Yes	Yes
<b>5. Data capturing (keyboarding) methods</b>					
a) On screen/model					
b) With scanner	Yes	Yes	Yes	Yes	Yes
c) By means of a transfer of data files	No	No	No	...	No

C. Operating environment									
<b>1. Description of system</b>									
a) PCs (Micro computers)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
b) Data exchange between base and results	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
c) Networked (direct, between micro computers)	No (ongoing study)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
<b>2. Equipment</b>									
a) Minimum memory capacity	486, RAM = 16 MB	Intel 486 RAM = 16MB or 64 MB with Wind				Pentium 100Mhz, RAM = 32 MB	486		486
b) CD-Rom	Yes	No				Yes	...		Oui
c) Disk drive	Yes	Yes				Yes	Yes		...
<b>3. Supporting software</b>									
a) Operating system	Wind' 95	Wind'95				Wind' NT	Wind'95		Wind'95
b) Independent data base management system	Progress 8.1	Borl'd, DB. Engine, Paradox v5 tab.				Oracle 7	...		...
c) "Word" program	Winword	Any Wind 95				Winword	Winword		Winword
d) Spreadsheet	Excel	Any Wind 95				Excel	Excel		Lotus
e) Computing tools used in programming	Progress L4G	Delphi III				MS Visual C++	MS-VBA		Lotus
<b>4. Working language(s) for program and documentation</b>									
a) English	End 1998	Yes				Yes	Yes		Yes
b) Spanish	On request	No				No	No		Yes
c) France	Yes	No				No	No		For 1999
d) Portuguese	On request	No				No	No		Yes
e) Other	On request	On request				No	On request		No

Source: Annex to the report on the meeting on support modules used in national accounts compilation. Luxembourg, 11-12 May 1998

	ERE/TES	IAS-96	SNA-NT	SNAPC	UNSNA
<b>D. Coverage and training</b>					
<b>1. By region</b>					
a) Africa	4	...	...	3	2
b) Caribbean and Pacific	...	2	1	...	...
c) Asia	...	1	...	1	2
d) Mediterranean	...	1	...	...	...
e) Eastern Europe	...	2	...	...	...
f) Latin America	...	...	...	...	3
g) Western Europe	...	...	1	...	...
<b>2. Installation and type of assistance available</b>					
a) Direct installation	Yes	Yes	Yes	Yes	Yes
b) Installation adapted to local conditions	Yes	Yes	Yes	Yes	Yes
c) Maintenance of software	No	No	No	No	No
d) Maintenance of program	Yes	Yes	Yes	Yes	Yes
e) Documentation on program	Yes	Yes	Yes	Yes	Yes
f) Available services on network	E-Mail, Fax Annually (envisaged)	E-Mail 3 years	E-Mail 3 years	E-Mail, Fax ...	No ...
g) Initial licence					
<b>3. Type of training</b>					
a) Training course in program access	Yes	Yes	Yes	Yes	Yes
b) Induction course in SNA 1993	Yes	Yes	Yes	Yes	Yes
c) Specialized training in informatics	Yes	Yes	Yes	Yes	No
d) Advanced training in SNA 1993	Yes	Yes	Yes	Yes	Yes
e) Consulting services	Yes	YES	Yes	Yes	Yes

Source: Annex to the report on the meeting on support modules used in national accounts compilation. Luxembourg, 11-12 May 1998.

## H. Bibliography

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