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FOOD AND AGRICULTURAL ORGANISATION (FAO)

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD)

DATA QUALITY AS LIMITING FACTOR IN THE MEASURING AND ANALYSIS OF FOOD SUPPLIES - FAO'S AFRICA EXPERIENCE

Invited paper submitted by Food and Agriculture Organization (FAO)*

Summary: This paper gives a broad overview of the problems which FAO faces in measuring food supply in African countries. The first part pinpoints the purpose and importance of FAO basic statistics. The second part presents the methodology for measuring food supply. The third part reviews food supply in Africa. The last part attempts to evaluate the agriculture data quality used for measuring food supply.

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* Prepared by Vincent Ngendakumana, FAO/ESSB.

I. Purpose and importance of FAO basic statistics

1. Article 1 of The FAO Constitution states that *« the Organisation shall collect, analyse, interpret and disseminate information relating to nutrition, food and agriculture »*. This work represents a significant part of the normative activities of the different FAO units. Currently there are several **Divisions that are involved in data collection and compilation from more than 200 countries (including 54 African countries).** The Statistics Division (ESS) is one of the main Divisions responsible for FAO statistical activities.

2. Among other activities, FAO Statistics Division covers data collection (from countries) related to all elements to be used for the construction of the commodity balances (Supply Utilisation Account) and the Food Balance Sheet for each country.

3. Data are stored and processed through the WAICENT/FAOSTAT in order to meet on-line/interactive FAO user requirements. Material in the form of printed publications, CD-ROMs and other electronic means are provided to external users, member nations and international organisations. The printed publications include the FAO Production Yearbook, Bulletin of Statistics, the FAO Trade Yearbook, the FAO Fertiliser Yearbook and the Food Balance Sheet Publication.

4. As for other member countries, statistical information collected on African countries is broadly disseminated (publications, Internet, etc.) and extensively used:

- **to provide information** (primary data and derived statistics/indicators) relating to production, trade, prices, consumption, means of production, structure and related aspects of agriculture, fisheries, forestry and forest products **to National Governments and International Organisations, academic and research institutions, private companies and individuals, NGOs, etc.**
- **To review and monitor development progress** in the field of food and agriculture of nations and regions in documents such as "The State of Food and Agriculture" (SOFA), "The State of World Fisheries and Aquaculture" (SOFIA), "State of the World's Forests" (SOFO), "The State of Food Insecurity in the World" (SOFI), Food Outlook, and to provide the necessary data for FAO global studies.
- **To provide inputs to various Intergovernmental fora** such as the Committee on Commodity Problems (CCP), its subsidiary Intergovernmental Groups (IGGs), Committee on World Food Security (CFS), Advisory Committee on Fisheries Research (ACFR), Committee on Paper and Wood Products (ACPWP), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

5. The rapidly growing demand for FAO statistics is signalled, among others, by the increasing number of queries on FAOSTAT through our web site which, in turn, provides an impetus for the systematic monitoring and improvement of the quality of our statistical products. Good quality statistics is then needed in order to effectively meet the demand and provide input for the analysis and support for studies on food and agriculture at global, regional and national level.

II. Methodology of measuring food supply

Type and volume of information needed

Statistical unit needed for SUA: each food commodity/item

- The database covers about 1500 commodity accounts for crops and crop products, livestock and livestock products, fish and fishery products. These commodities are also classified into major food groups for Food Balance Sheets (FBS) purposes (see Annex 1).

Variables needed: supply and utilization elements of each food item, in quantity

- The supply is composed of production, imports and stock changes and the utilization is composed of exports, food, seed, feed, waste, industrial use and other use, for each food item.

- Technical Conversion Factors (TCF)

Data source

- Each data cell has another cell attached to it that contains the data symbol corresponding to the data source.

Variables needed for FBS

- Population figures, nutrition factors (for converting the food into calories, proteins and fats).

Period: each year

- Database coverage started in 1961. The database is updated regularly (annually about 600 thousand data cells have to be updated). The Supply Utilization Accounts, as time series, are constructed annually. The FBS is also produced annually and can be calculated as an average of a number of years.

Area coverage: Each country

- The database covers more than 200 countries. Aggregates are also created by geographical and economic areas.

Supply Utilization Accounts and Food Balance Sheets as measure of food availability: steps for their preparation

Step 1. Documentation (to make a thorough search for all needed figures)

6. National food and agricultural data are collected and compiled along with other information pertinent to the preparation of SUA and FBS[1]. They are obtained through different channels. Generally, they come from many sources including censuses and survey reports as well as from administrative records, statistical abstracts, questionnaires, etc. If official information is missing or unreliable, other sources or estimates can be considered.

7. FAO's data collection methods are strongly dependent on the diversity of national data resources on food and agriculture statistics and on the national potential to disseminate reliable information and to utilise electronic means to archive statistics. The most common method for data collection uses the *questionnaires* as a support for statistical information. There are two main categories of questionnaires: the *annual questionnaires,* which request data for production, trade, fertilizer, forestry and fishery statistics on a considerable number of items and the *special or periodical questionnaires* which are used to collect information for a shorter list of commodities or items.

8. In recent years this traditional method for data collection has been replaced by more efficient ones based on new *electronic means* (CD-ROM, diskette, e-mail, ftp[2]) especially to collect import and export data. At present some 80 countries, comprising more than three-quarters of world trade, provide external trade data in electronic format.

9. The information received from authorised national institutions using one of these two methods cover an important part of the main indicators of statistical databases, but for many other items or elements data are still missing. The data obtained from questionnaires or electronic files are completed by statistics from many other sources: national or international organisations' publications or databases, private or non-governmental institutions, newspapers or Internet publications.

10. Recently, following the initiative of the Statistics Division, a new type of data collection method is under implementation using the *virtual questionnaire* to collect and verify data on production of primary and derived agriculture products, livestock numbers and livestock products, land use, and many other basic agricultural statistics. The advantages of this new tool will influence, in a positive way, the decisions on the standardisation of FAO's data collection and data transmission system.

Step 2. Data input and control (reconciliation, adjustments and estimates)

11. As the basic data are necessarily based on a large variety of sources, reconciliation, adjustments and estimation/imputation of the missing data are necessary. This is done in order to maintain a certain degree of consistency, completeness and reliability of the resulting FBS. Missing data are estimated on the basis of various surveys, other information available to the economics and statistics community through the media and particular professional journals, as

well as technical expertise available in FAO. Harmonization is necessary to facilitate international comparisons.

Step 3. Construction of Supply Utilization Accounts (SUAs)

12. To illustrate how to prepare SUAs, it is assumed that all information required is available and compiled. The account of every commodity has to be constructed keeping in mind that the balance of the equation (between supply and utilization) is always maintained.

Step 4. Calculating Per Caput Food Supply

13. The *per caput* figure of each food commodity is obtained by dividing the food available for human consumption figure by the total population consuming it during the reference period. It can be given in terms of quantity, in kilograms per year or in grams per day.

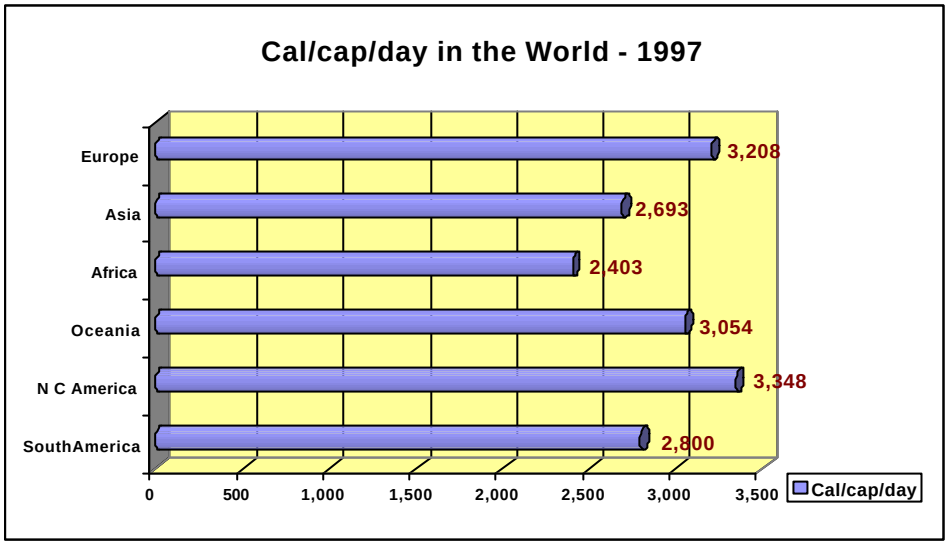
Step 5. Standardization and production of Food Balance Sheets (FBS)

14. The FBS are derived from SUAs' time series and calculated for a single year (or an average for a number of years), multiplying the food available by the nutritive factors, to assess the calories, protein and fat available to the population. Calorie supplies are expressed in kilocalories (calories) per day, while supplies of protein and fat are provided in grams per day. For the purpose of calculating the caloric value and the protein and fat content of the *per caput* food supplies, the choice of the appropriate food composition factors is very important. For example, the choice of the food composition factors for wheat flour depends, among other factors, on the water content, variety and the degree of milling involved.

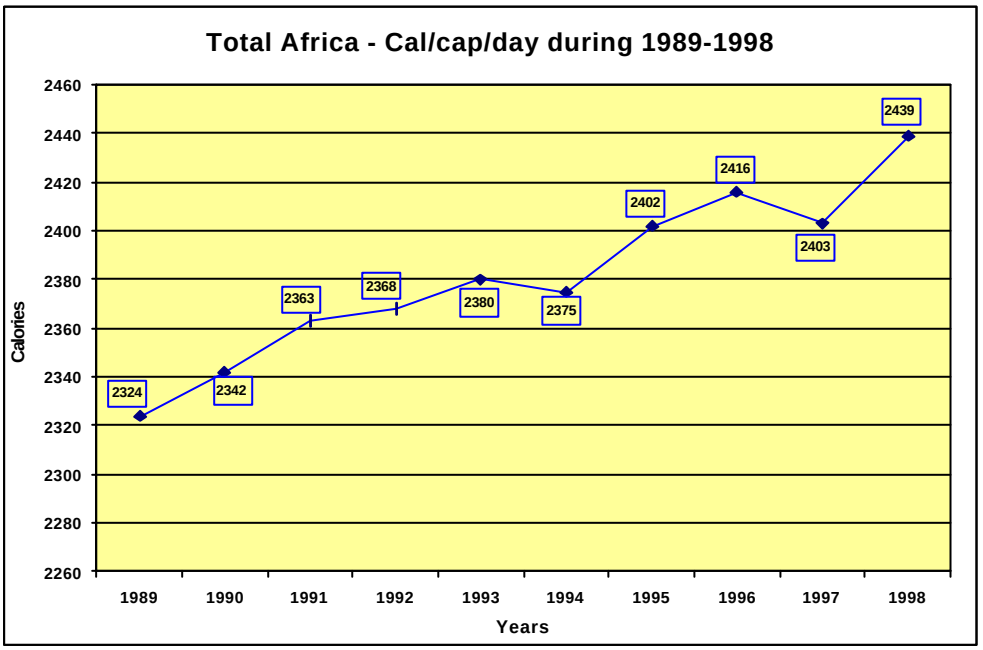
15. The utilization of all the information which was assembled for the construction of a Supply Utilisation Account and a Food Balance Sheet often ends up in a rather long list of food commodities. This is certainly very useful in order to select the appropriate food composition factors which are required for expressing *per caput* food supplies in terms of energy, protein and fat content. On the other hand, this detailed presentation no longer has the advantage of showing a comprehensive picture of a country's food supply. This dilemma can be solved by standardising the detailed food balance sheet. Standardisation can be achieved by showing only primary commodities, i.e. processed commodities are converted back into their originating primary commodity equivalent. This procedure greatly facilitates the analysis of food balance sheets with no loss of pertinent information. Annex 2 shows a concrete example (FBS for Africa in 1998).

III. Review of African food supply

3.1. Review of food supply in the World



3.2. Trend of African food supply (1989-1998)



National level of food supply (in 1997-1998)[3]

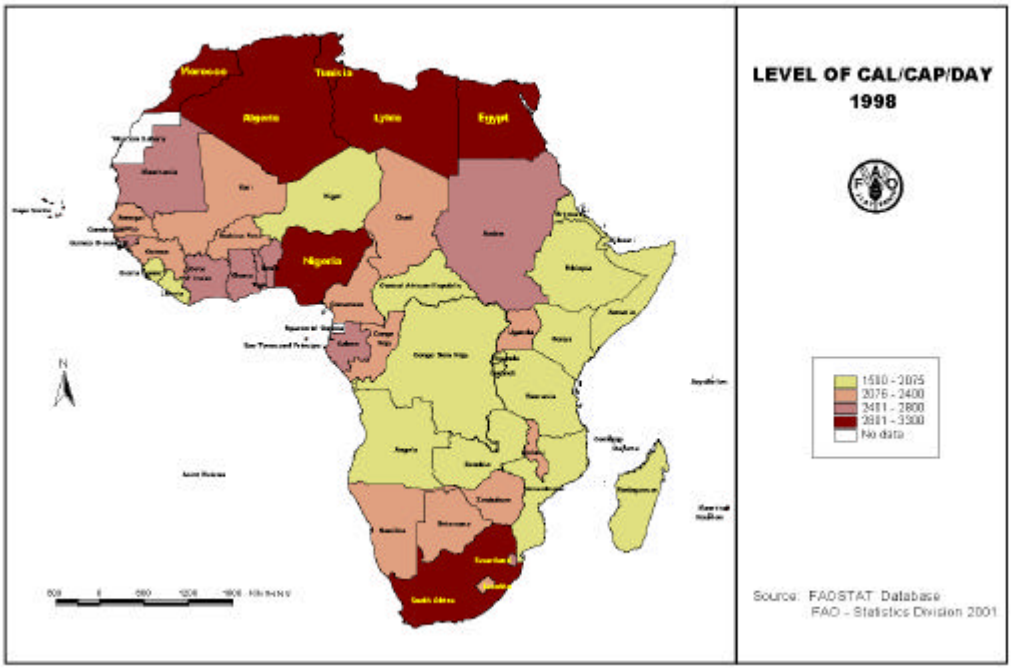
- Countries whose food supply is significantly below continental average: Somalia, Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Comoros, Mozambique, Angola, Zambia, Niger, Kenya, Liberia, Tanzania, Madagascar, Rwanda, Sierra Leone, Central African Republic and Djibouti.

- Countries below continental average: Namibia, Mali, Burkina Faso, Zimbabwe, Botswana, Chad, Sao Tome y Principe, Cameroon, Lesotho, Uganda, Malawi, Congo Republic, Senegal and Guinea.

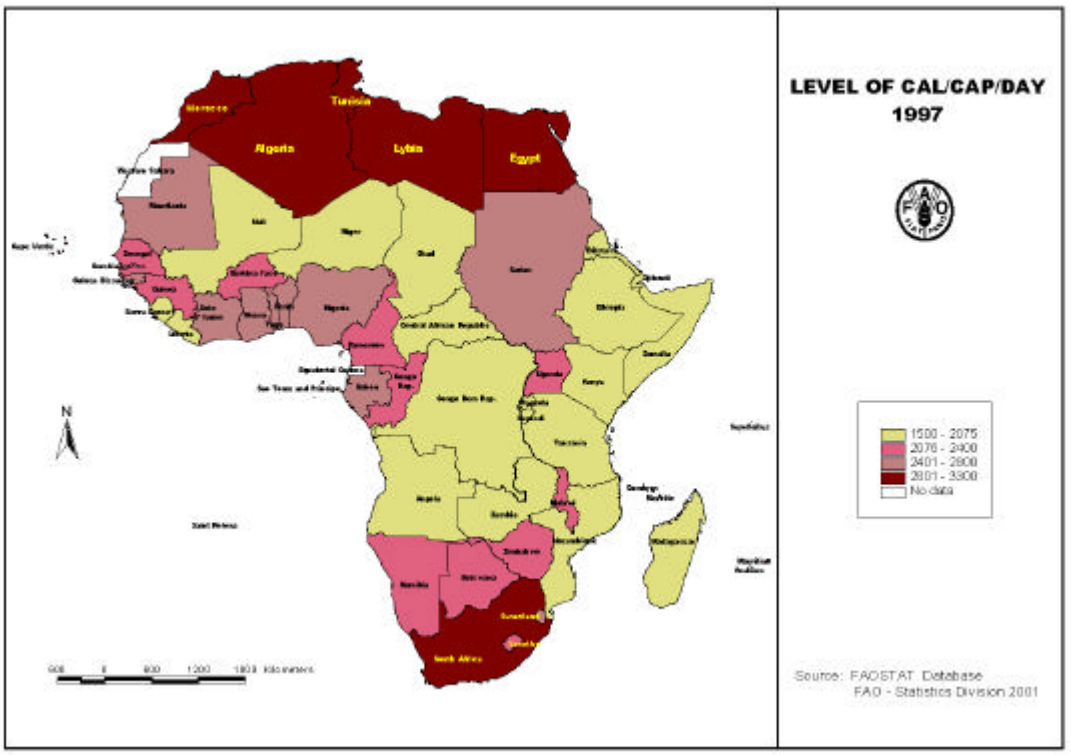
- Countries above continental average: Guinea Bissau, Sudan, Seychelles, Swaziland, Togo, Gambia, Gabon, Benin, Mauritania, Ghana, Côte d'Ivoire and Nigeria.

- Countries whose food supply is significantly above continental average: South Africa, Mauritius, Algeria, Cape Verde, Morocco, Libya, Egypt and Tunisia.

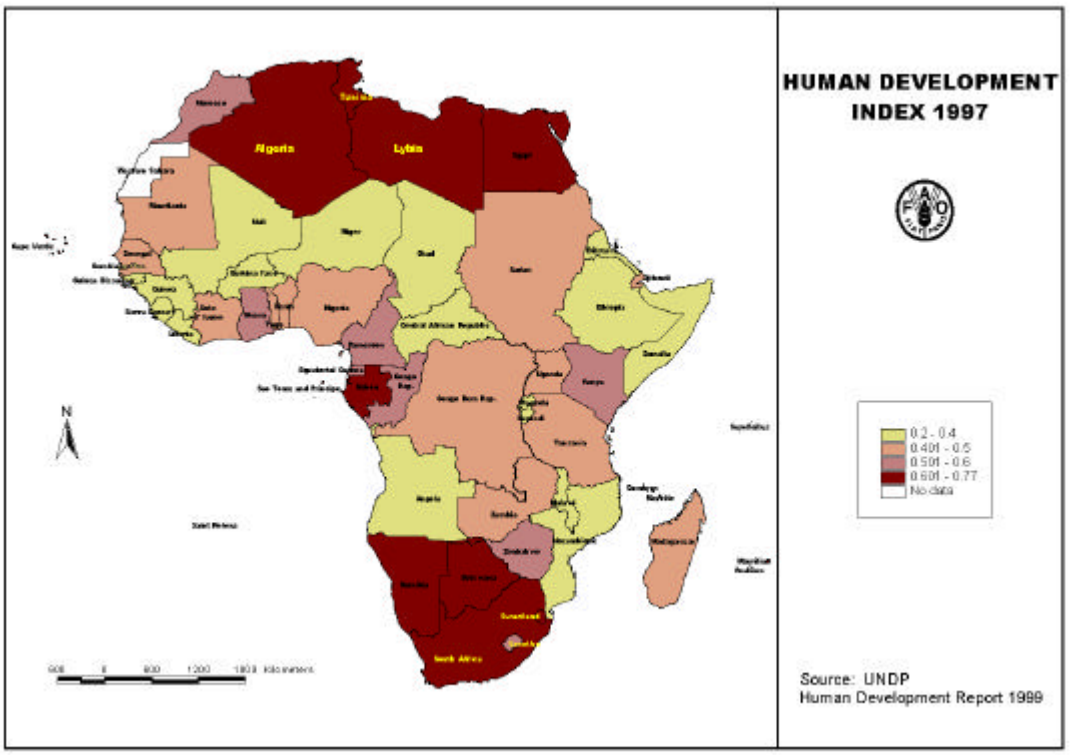
National level of Cal/cap/day in 1998



National level of Cal/cap/day in 1997



National level of Human Development Index (HDI) in 1997



IV. Evaluation of agricultural data quality

Criteria to evaluate data quality

16. The quality of statistics is a global concept with many dimensions as indicated in the definition adopted by EUROSTAT: *Relevance, Accuracy, Timeliness and punctuality, Accessibility and clarity, Comparability, Coherence and Completeness*. It is closely related to the use of the data. Individual users will attach more or less importance to each one of its components. Accuracy and comparability might be the most important components for statistical data that has a financial impact, while for assessing short term trends, speed and timeliness is a key factor. It is therefore up to the user to decide and determine the quality criteria most relevant.

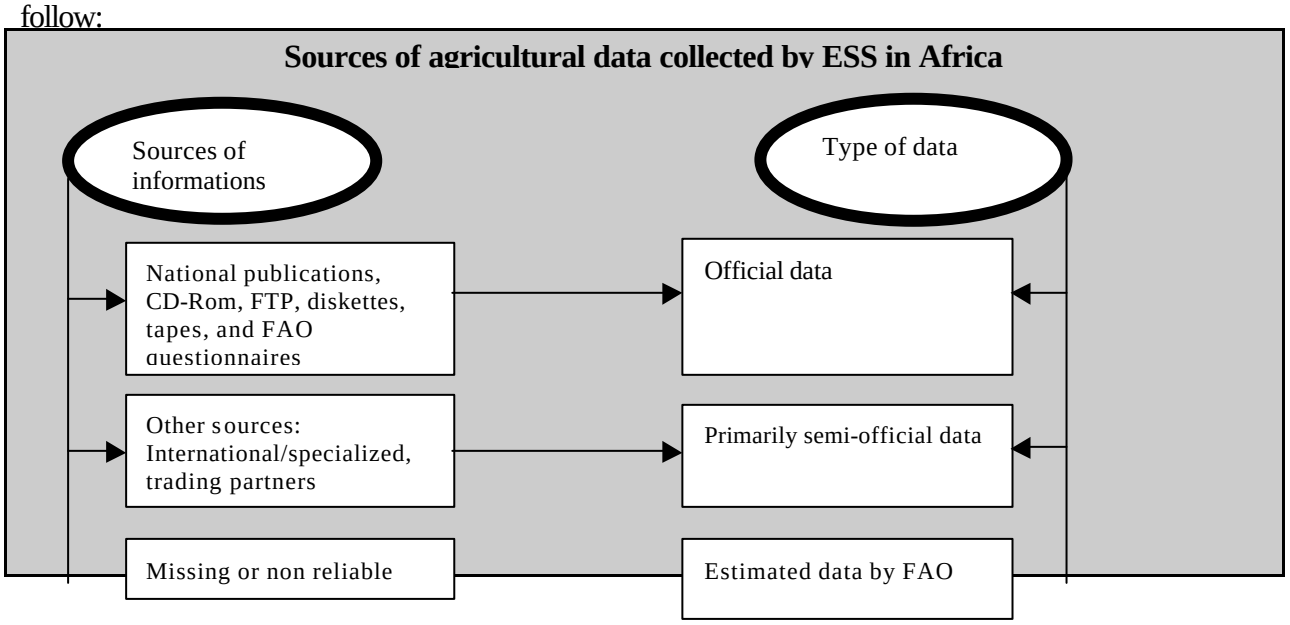
EUROSTAT definition of quality of statistics

1. *Relevance of statistical concepts* : A survey is relevant if it meets user's needs. The identification of users and their expectations is therefore necessary.
2. *Accuracy of estimates* : Accuracy is defined as the closeness between the estimated value and the (unknown) true population value. Assessing the accuracy of an estimate involves analysing the total error associated with the estimate and takes in account the metadata.
3. *Timeliness and punctuality in disseminating results* : Most users want up-to-date figures, which are published frequently and on time at pre-established dates.
4. *Accessibility and clarity of the information* : Statistical data are valuable when they are easily accessible by users, are available in the forms users desire and are adequately documented.
5. *Comparability of statistics* : Statistics have the greatest usefulness when they enable reliable comparisons of figures across space and over time. The comparability component stresses the comparison of the same statistics between countries in order to evaluate the meaning of aggregated statistics at the global level.
6. *Coherence* : When originating from different sources, and in particular from statistical surveys of different frequencies, statistics are coherent insofar as they are based on common definitions, classifications and methodological standards. The messages that statistics convey to users will then clearly relate to each other, or at least will not contradict each other.
7. *Completeness* : Domains for which statistics are available should reflect all the needs

Status of reporting channels in Africa : Unavailability and incompleteness of basic data

Reporting channels

17. National food and agricultural data are obtained through different channels summarised as follow:



18. For African countries, the problems related to the status of the reporting can be analysed considering four aspects/approaches: the number of reporting countries, the coverage of commodities reported, the weighted quantity/value share of commodities reported and the trend status.

Number of reporting countries

19. The major concerns with data reporting in African countries can be illustrated considering agricultural production and external trade data. Recent facts are alarming:

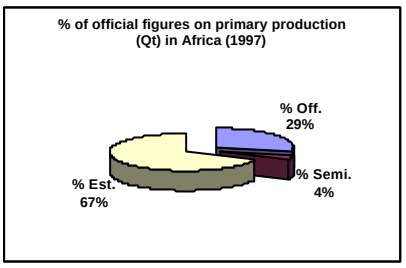
- In 1999, agricultural production statistics were requested from all 54 African countries; but only 26 replies were obtained on time (48 %). The countries which did not reply on time were: **Angola, Comoros, Democratic Republic of Congo, Djibouti, Eritrea, Gabon, Guinea Bissau, Liberia, Libya and Somalia**. Those same countries have not reported agricultural production in the last five years (and some of them in the last decade).
- The same number of requests for external trade data were made and 14 replies were received within the deadline (26%). Major countries which did not reply include: **Algeria, Angola, Benin, Burkina Faso, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Côte d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Gabon, Gambia, Guinea, Guinea Bissau, Liberia, Libya, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome y Principe, Sierra Leone, Somalia, Sudan, Tanzania, Togo and Uganda**. There are 35 countries which have not reported external trade data in the last five years and about a dozen which have not reported trade data for a decade.

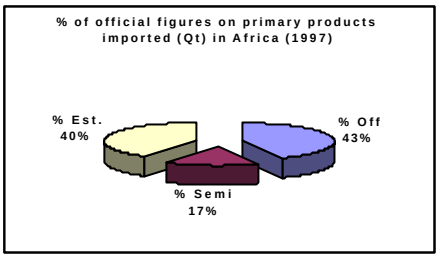
20. For some of the countries where no response is obtained, this may be so because of internal or external conflicts. Examples of such countries include: Sierra Leone, Somalia, Democratic Republic of Congo, Liberia. However, the above figures of non-response indicate that serious data reporting problems do exist in the Region.

Coverage of commodities reported

21. Even if a country can be considered as a "good reporter", its set of information can be partial, relating to some selected commodities only, especially in the commercial sector (generally for production). This situation distorts the numbers of official versus non-official data, as a number of countries have a very small commercial agriculture sector. In addition, data on livestock are the more troubling and more elusive.

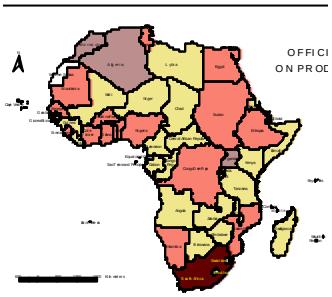
Number of official figures on primary products versus number of estimates in 1997[4] (commodity coverage approach)

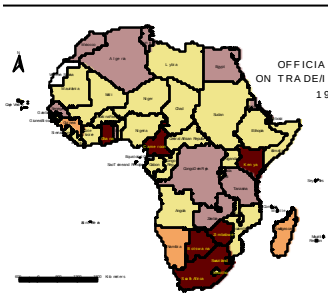




National level of official figures on primary production in 1997.

National level of official figures on primary products imported in 1997.

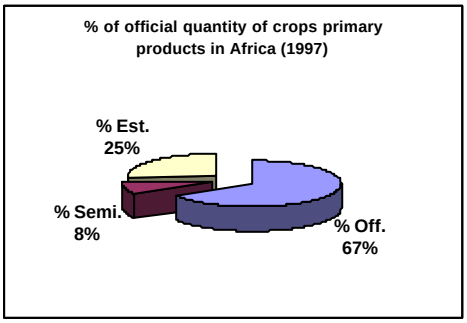


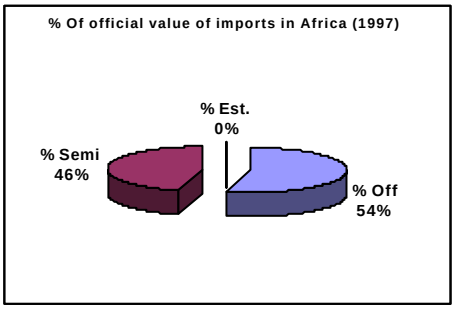


22. Unfortunately, this assessment does not take into account the weight (quantity or value) of each commodity reported. It just gives an idea of the level covered by the commodities reported.

Weighted quantity/value share of commodities reported

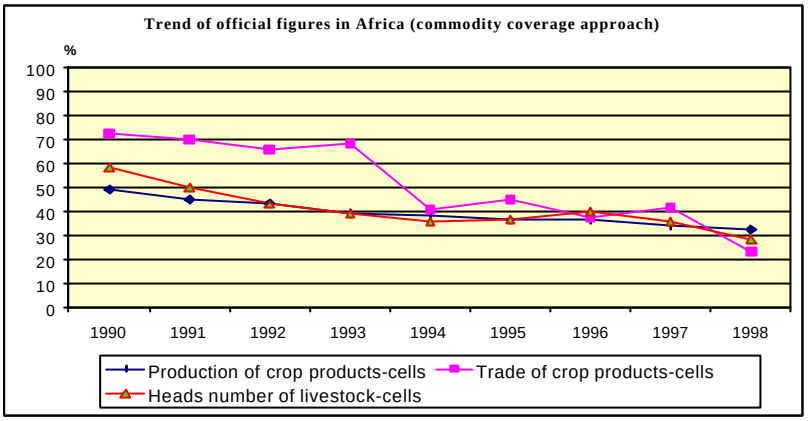
23. While many commodity data appear to be estimated in FAO data system, the percentage share of the official data weighted by value/quantity, however, is rather high, as shown below.



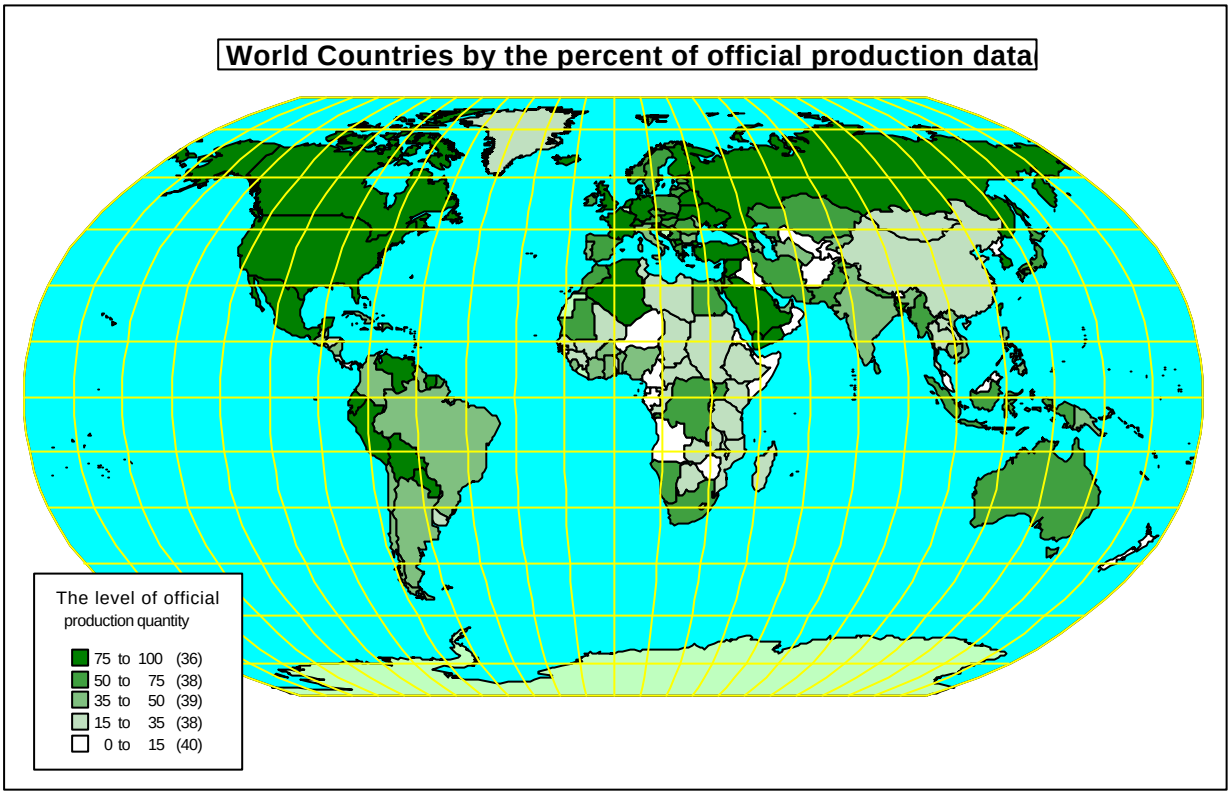


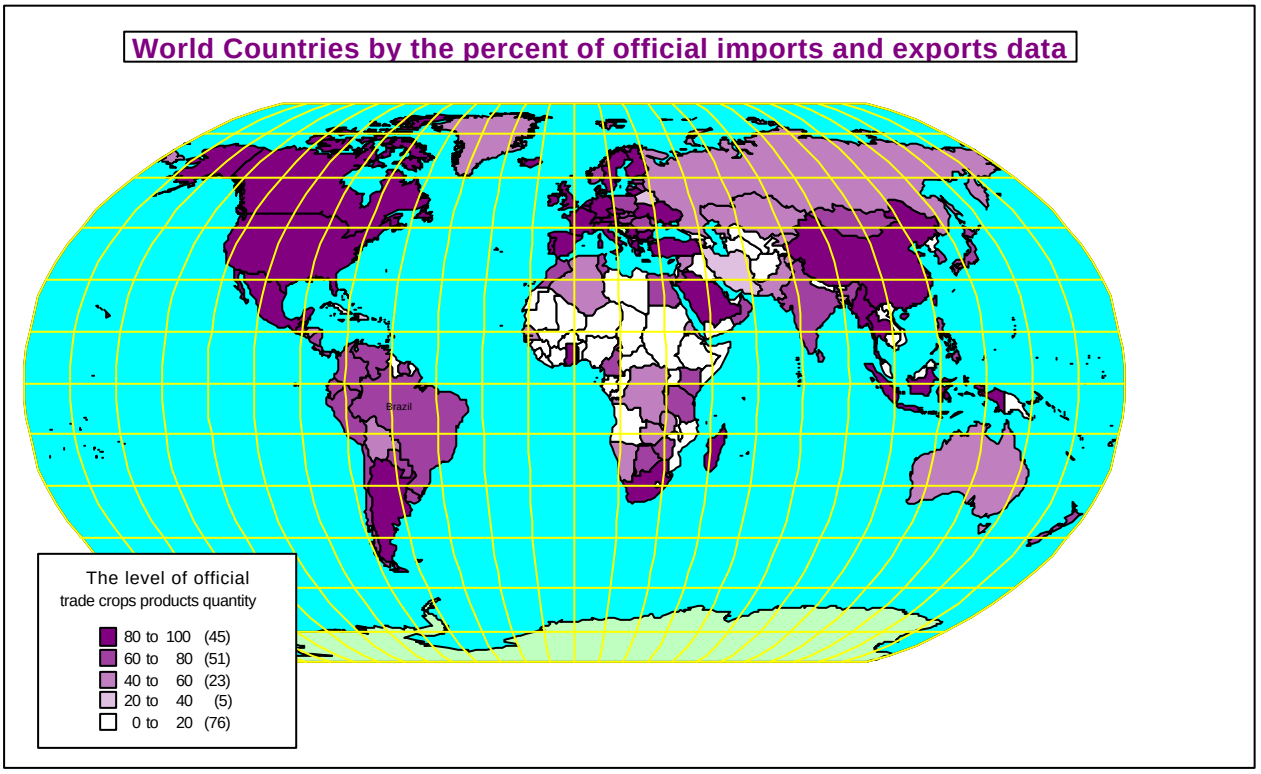
Trend status

24. This aspect has to be analysed, because one country can report one period and not others. For example the graph below shows that since 1990, the trend of official figures on primary crops seems to be decreasing. In fact, data collection is “a catch up process”; so this annual view of official data is not unexpected.



Part of official data in the total number of FAOSTAT database cells

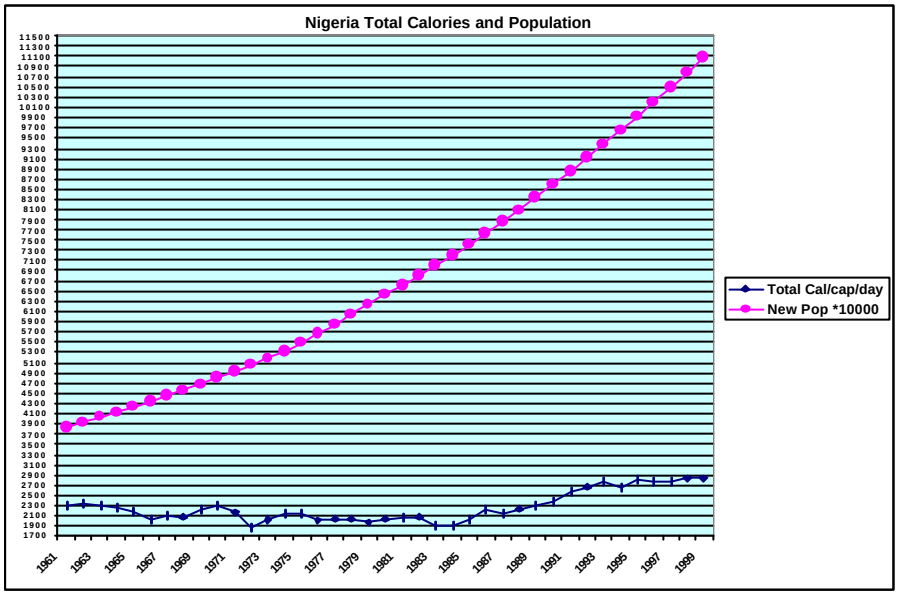


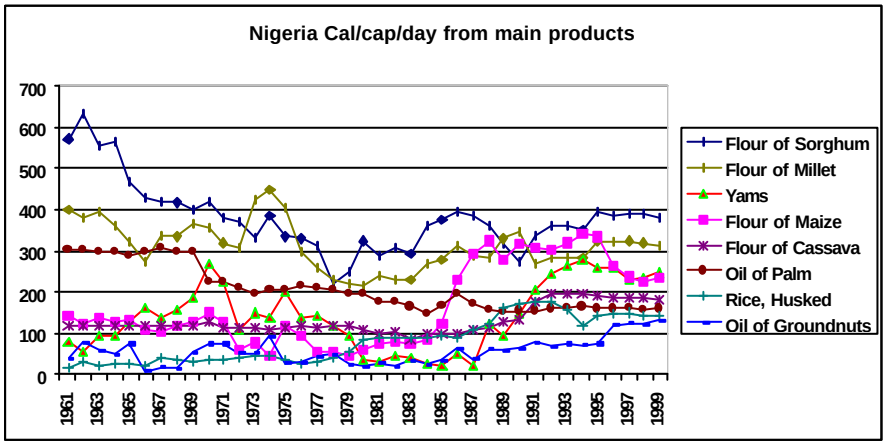


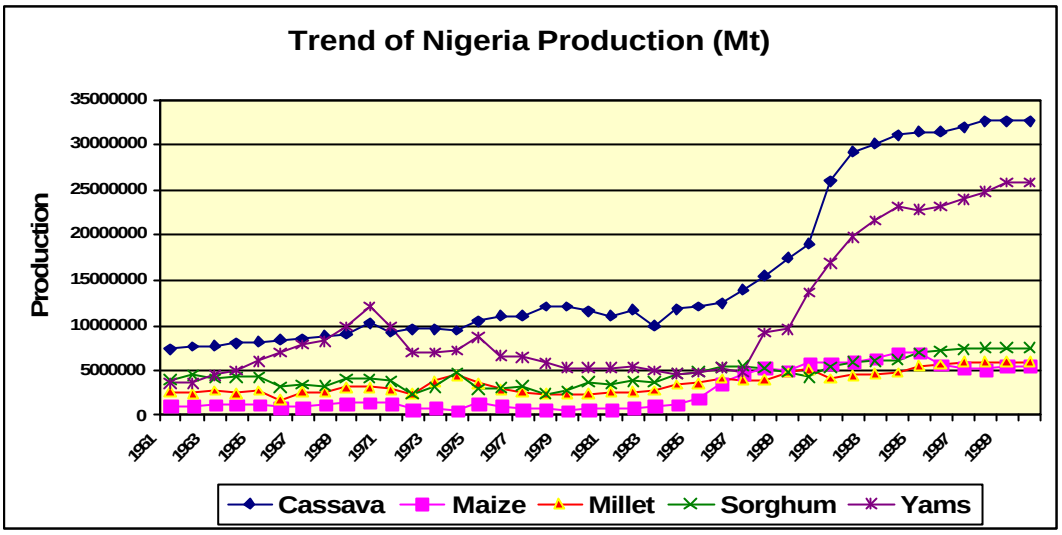
Inaccuracy/inconsistency of African basic data

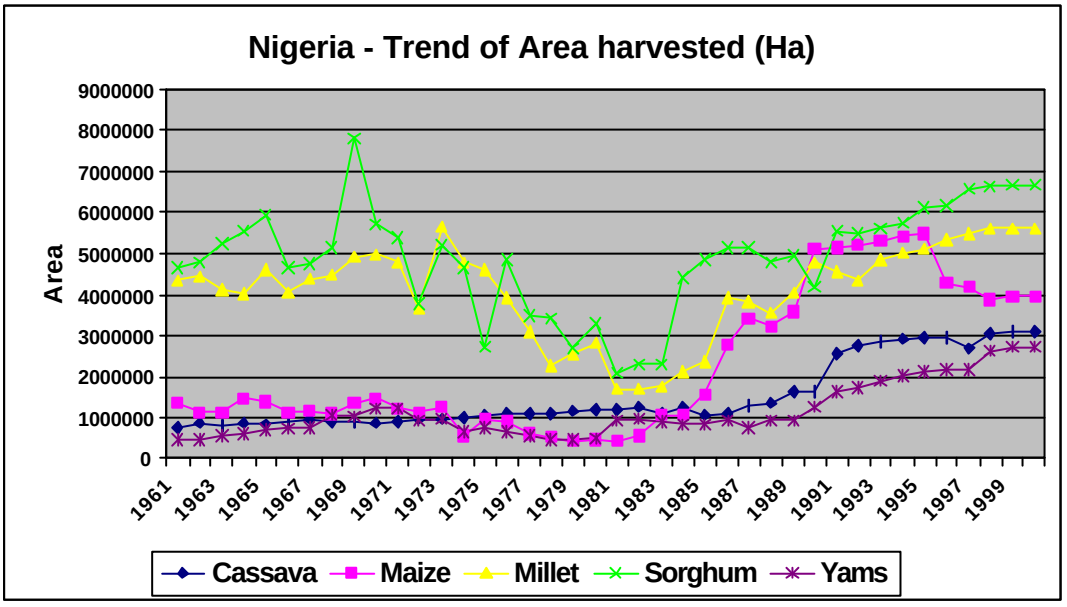
25. Even where statistics are available, there is sometimes a problem of their consistency (between data sources[5], SUA elements and time series) and reliability[6]. There is also a lack of relevant classification/nomenclature[7] and additional meta data (quality of data, clear concepts/definition of items reported[8], data source[9], etc.). In addition, methodology of data collection or estimation is not always available. This may be due to the fact that crop patterns and utilization of some crops in developing countries are sometimes rather complicated, making it difficult to make estimates and reconciliation.

Case Study: Nigeria





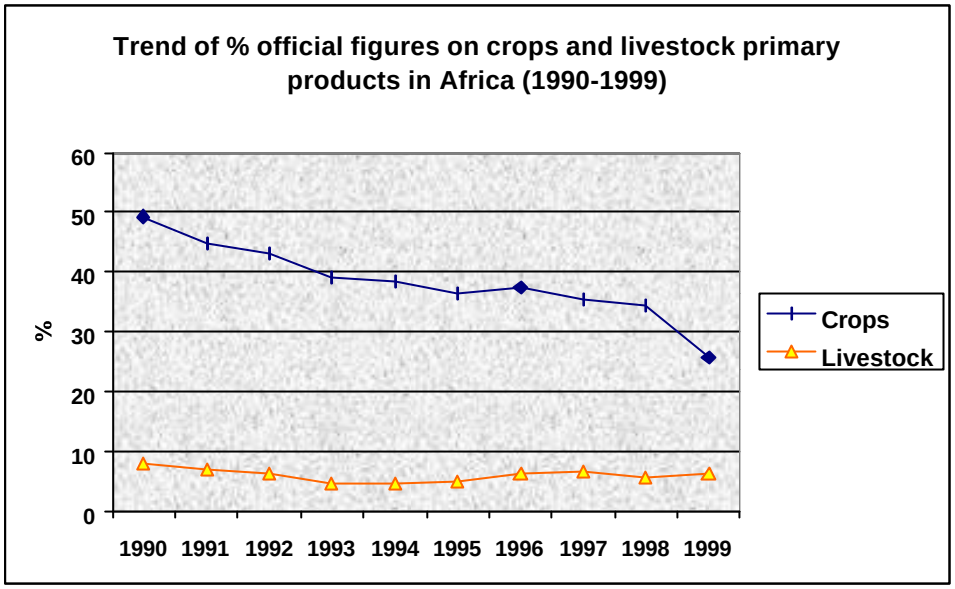

Trend of Nigeria Production (Mt)
Production
35000000
30000000
25000000
20000000
15000000
10000000
5000000
0
1961
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
Cassava
Maize
Millet
Sorghum
Yams

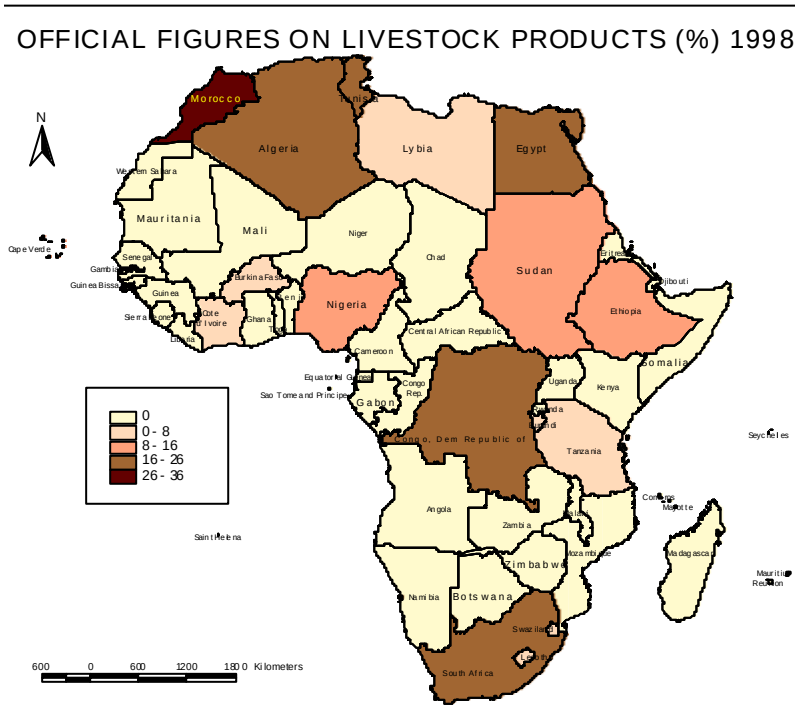

Nigeria - Trend of Area harvested (Ha)
Area
9000000
8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
1961
1963
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
Cassava
Maize
Millet
Sorghum
Yams

Case of some groups of products

26. Some typical examples are listed hereafter:

- *Root crops (e.g. cassava)*: they are not completely harvested at the same time; some is left as a reserve from which to draw if the need arises, or even allowed to rot.
- *Mixed crops:* major food crops may not be grown in pure stands but mix-cropped in fields of bewildering complexity.
- *Non commercial production*: this is a conceptual problem which arises frequently with respect to coverage/representativeness of the basic data. Production statistics are mostly confined to commercialised major food crops only. Non-commercial or subsistence production (i.e. home produce and food from hunting, fishing and gathering by the households for their own consumption) are usually not included. This might be an appreciable part of total production in some countries.
- *Livestock statistics*: they constitute a serious problem; data are absent or incomplete for almost all African countries, due to the problem of informally slaughtered animals, informal trade of animals (example: Chad, Burundi), nomadic livestock, milk not passing through dairies, etc.


Trend of % official figures on crops and livestock primary products in Africa (1990-1999)
60
50
40
30
20
10
0
%
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
Crops
Livestock

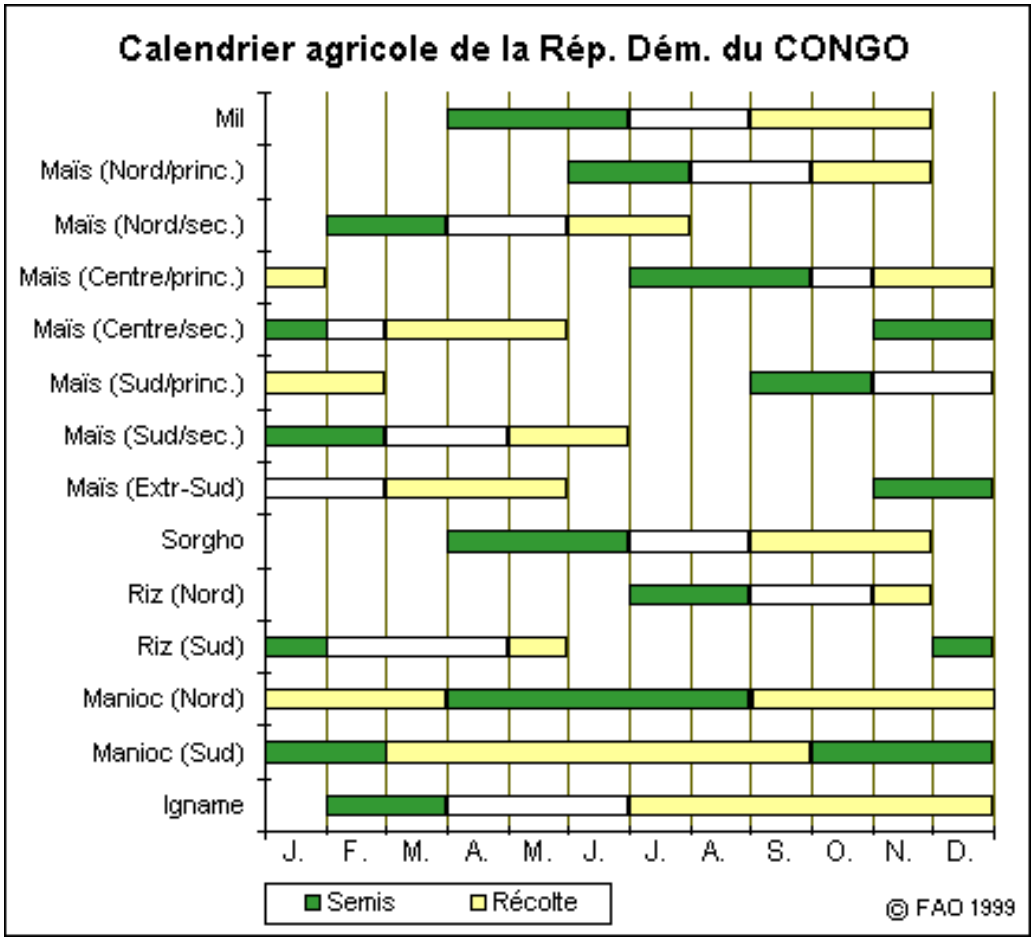

OFFICIAL FIGURES ON LIVESTOCK PRODUCTS (%) 1998
N
Morocco
Algeria
Lybia
Egypt
Mauritania
Mali
Niger
Chad
Sudan
Nigeria
Ethiopia
Somalia
Kenya
Tanzania
Angola
Zambia
Zimbabwe
Namibia
Botswana
South Africa
0
0 - 8
8 - 16
16 - 26
26 - 36
600 0 600 1200 1800 Kilometers

Case of categories of data in supply balances -food balance sheets

- *Production measurement*: Reliability of official production data may be questionable. This is because farmers frequently associate production with tax collection. In some cases, reliable information on pre-harvest food grain losses caused by pests and diseases are not usually available. Hence, the estimates of yield are likely to be inaccurate. In that case, production statistics derived from the harvested area and the estimated yield may be subjected to a biased estimation. Additionally, in some countries, only the planted area and not the harvested is measured. The consequence is that the production deduced is biological and not economic. Also, there is a problem about the units. Some farmers measure quantities in terms of common household containers.
- *Stocks*: information on commercial stocks may be available from official or marketing authorities, factories, wholesalers and retailers, but inventories of catering establishments, institutions and households may not be available.
- *Waste*: information on waste in industrial processing may be available, but waste during storage or transportation may not be available. Indeed, there are very few surveys on which to base sound figures for waste. In these cases, some adjustments and assumptions based on expert opinion (obtained in a country) are required to adapt the basic data to food balance sheets concepts/coverage. These estimates are usually subject to significant margins of error.
- *Trade data*: import and export data may be accurate in the majority of countries, but in some countries there may be significant amounts of trade across national boundaries that go unrecorded. Moreover, import and export transactions may not receive equal attention from the custom's administration because taxes or quantitative controls are generally concentrated more on imports rather than exports. Inaccuracies can be created by misclassification of the trade data, excluding quantity of food aid (example: Ethiopia, Mozambique, etc.) or lack of knowledge by detailed item, by status of item and nationality of beneficiaries. As a consequence, the reliability of trade data may also be questionable.
- *Feed, seed and other utilisation*: the availability of basic data on the feed, seed and industrial/manufacture use components are rather limited. The production surveys and manufacturing surveys, which are the appropriate sources of data, have not been conducted regularly in most developing countries. Even where the surveys are conducted, their coverage is usually limited (e.g. cost of production surveys cover only a few major crops or do not cover livestock commodities, etc.).
- *Population*: the estimate of the total population is also a part of the set of official statistics. However, for many countries, this figure may also be either incomplete or unreliable. The total population estimates may refer to resident population only. Thus, non-resident population, such as illegal immigrants, tourists, refugees, foreign diplomatic personnel and their dependents, foreign armed forces, etc., are not included. This omission may constitute a considerable number in some countries. This, therefore, would understate the total partaker population. Moreover, the impact of AIDS is not well evaluated. Services of civil status is not necessarily functional for demographic monitoring. One demographic census is carried out every ten years, etc. Finally, UN and national population figures are sometimes inconsistent.

Time-reference period

- There are also problems related to the time-reference period to be used in preparing supply utilisation accounts (food balance sheets). Several twelve-month periods, such as July/June, October/September, April/March, have been proposed and were indeed also applied. However, none of these periods satisfactorily and uniformly suits the production of all agricultural commodities, their trade and domestic utilisation. It can be assumed that there is no single twelve-month period which is fully suitable for recording supply and utilization for all products. It was therefore felt that although the calendar year time-reference period (January-December) might not be a completely satisfactory solution, its advantage would appear to outweigh its disadvantages. The application of a calendar year time-reference period during which the bulk of the harvest takes place also helps in linking the agricultural statistics with those of the industrial and other sectors of the economy.



V. Constraints to the development of sustainable agricultural statistics systems in Africa

27. Many of the problems and constraints associated with food and agricultural statistics are typical of the development of national statistical systems in general: poor co-ordination of scarce resources, especially of donor assistance; programmes reflecting the interests of donors rather than those of the country; non-sustainability of externally funded programmes; lack of trained manpower, high turnover of staff from statistical systems and poor management practices. More specific problems for agricultural statistics in Africa include:

- weak institutional arrangements: lack of clear identity and ownership for agricultural statistics (Ministries of Agriculture vs. Central Statistical Offices).
- Lack of co-ordination: lack of understanding and co-ordination between statistical agencies producing the data (data producers) and offices undertaking economic analysis, planning and decision-making (data users).
- Lack of government commitment: a key constraint in many countries.
- Lack of resources: Government priorities often exclude support to statistical systems.
- Poor data analysis and integration from various sources and poor access to and use of available data.
- Technical and methodological constraints: the complex environment of the agriculture sector in Africa (the bulk of African agricultural production comes from small traditional farmers using a wide variety of agricultural practices), coupled with a lack of documented and factual information on the farming practices used, presents a particular challenge for data collection. It also results in the high cost of data collection in Africa (more than 10 times the cost in developed countries).
- Role of technical co-operation: too much emphasis has been placed in the past on '*ad hoc*' and uncoordinated interventions over a short time period aimed at addressing a particular data gap rather than long term capacity building and the establishment of sustainable systems.

Annex 1
LIST OF COMMODITIES CLASSIFIED BY MAJOR FOOD GROUPS

CEREALS

Wheat	Rice (paddy)	Barley
Maize	Rye	Oats
Millet	Sorghum	Cereals, other

STARCHY ROOTS

Potatoes	Sweet potatoes	Cassava
Roots, other		

SUGAR

Sugar cane	Sugar beet	Sugar, non-centrifugal
Sugar (raw equiv.)	Honey	

PULSES

Beans	Peas	Pulses, other

TREE NUTS

Cashew nuts	Chestnuts	Almonds, Pistachio
Walnuts		

OIL CROPS-primary

Soybeans	Groundnuts	Sunflower seed
Rapeseed & Mustard seed	Cotton seed	Coconuts (incl.copra)
Sesame seed	Palm kernels	Olives
Oilcrops, other		

VEGETABLES

Tomatoes	Onions	Vegetables, other

FRUIT

Oranges & Mandarines	Lemons & Limes	Grapefruit
Citrus, other	Bananas	Plantains
Apples (excl. cider)	Pineapples	Dates
Grapes (excl. wine)	Fruit, other	

STIMULANTS

Coffee	Cocoa	Tea

SPICES

Pepper	Pimento	Clove
Spices, other		

ALCOHOLIC BEVERAGES

Wine	Barley beer	Beverages, fermented
Beverages, alcoholic	Alcohol, non-food	

MEAT

Beef & Veal	Mutton/goat meat	Pig meat
Poultry meat	Other meat	Offal

MILK

Cow milk	Sheep milk	Goat milk

EGGS

Hen eggs	Eggs, other

FISH AND SEAFOOD

Freshwater fish	Marine fish	Crustaceans
Molluscs		

VEGETABLE OILS- secondary

Soybean oil	Groundnut oil	Sunflower seed oil
Rape & mustard oil	Cottonseed oil	Palm kernel oil
Palm oil	Copra oil	Sesame seed oil
Olive oil	Oilcrops oil, other	

ANIMAL FATS

Butter, ghee	Cream	Fats, animal, raw

Annex 2 1998 FBS for Africa

COUNTRY Africa YEAR 1998 POPULATION 745,138,000

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRODUCTION	IMPORTS	STOCK CHANGES	EXPORTS	TOTAL	FEED	SEED	PROCESSING	WASTE	OTHER USES	FOOD	KILOGRAMS PER YEAR	PER DAY CALORIES	PER DAY PROTEIN	PER DAY FAT
	- 1000 METRIC TONS -													GRAMS	GRAMS
Grand Total													2439	60.6	50.8
Vegetable Products													2262	48.0	39.0
Animal Products													178	12.5	11.9
Cereals - excluding Beer	108906	42148	327	3088	148292	17188	3649	2898	14085	1158	109350	146.8	1236	33.1	8.3
Wheat	18804	27031	-2859	561	42415	1815	991	12	2929	654	36017	48.3	380	11.4	1.6
Rice (milled equivalent	10648	4480	736	444	15420	218	417	22	1117	126	13520	18.1	182	3.7	0.4
Barley - excluding beer	4523	2139	148	19	6791	1816	467	794	373	15	3327	4.5	32	0.9	0.1
Maize	38644	8049	3453	1825	48321	11409	707	620	4704	363	30517	41.0	357	9.2	3.5
Rye	30	4	0	1	33	2	2	23	0		6	0.1	0	0.0	0.0
Oats	157	40	14	2	209	53	71	1	6		79	0.1	1	0.0	0.0
Millet	13554	7	-666	27	12868	530	366	343	2135	0	9494	12.7	100	2.4	1.0
Sorghum	20808	243	-550	158	20344	1317	564	1083	2693	0	14687	19.7	162	4.8	1.6
Cereals, other	1738	154	51	53	1890	28	63	0	128	0	1703	2.3	21	0.6	0.1
Starchy Roots	154800	521	100	478	154943	4945	12162	-5	38514	628	98747	132.5	349	3.6	0.6
Cassava	90604	10	0	56	90558	4031		0	25344	534	60648	81.4	215	1.5	0.3
Potatoes	10136	457	0	403	10191	241	983	0	1045	93	7875	10.6	21	0.4	0.0
Sweet Potatoes	8578	0	100	6	8672	174	39		1176		7283	9.8	26	0.3	0.1
Yams	34349	1	0	7	34343	292	9120		8904	0	16027	21.5	59	0.9	0.1
Roots, other	11133	52	0	6	11179	205	2021	-5	2045		6913	9.3	29	0.4	0.0
Sugar crops	88065	0	0	4	88061	191	1657	78950	1754	2242	3267	4.4	3	0.0	0.1
Sugar Cane	83148	0	0	4	83145	91	1657	74784	1754	1592	3267	4.4	3	0.0	0.1
Sugar Beet	4917	0		0	4917	100		4167	0	650	0	0.0	0		
Sweeteners	9066	6451	-1151	2911	11454			32		226	11223	15.1	146	0.0	
Sugar, Non-Centrifugal	60	0	0	0	60			31			29	0.0	0	0.0	
Sugar (Raw Equivalent)	8772	6349	-1152	2855	11114			1		225	10889	14.6	142		

F O O D B A L A N C E S H E E T

COUNTRY Africa YEAR 1998 POPULATION 745,138,(

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRO-DUC-TION	IM-PORTS	STOCK CHAN-GES	EX-PORTS	TOTAL	FEED	SEED	PRO-CESS-ING	WASTE	OTHER USES	FOOD	KILO-GRAMS PER YEAR	PER DAY CALO RIES	PER DAY PRO-TEIN	PER DAY FAT
	- 1000 METRIC TONS -													GRAMS	GRAMS
Sweeteners, other	96	101	0	56	142			0		1	167	0.2	2	0.0	
Honey	137	1	0	0	138						138	0.2	2	0.0	
Pulses	8232	599	-295	177	8359	593	693		966	0	6126	8.2	76	5.1	0.4
Beans	1847	166	21	84	1950		148		172	0	1630	2.2	20	1.3	0.1
Peas	282	52	0	24	311	0	20		16		294	0.4	4	0.2	0.0
Pulses, other	6103	381	-316	70	6098	593	525		778		4203	5.6	53	3.5	0.3
Tree nuts	915	63	49	322	705				22	15	670	0.9	7	0.2	0.4
Oil crops	30856	875	339	1072	30998	20	788	24846	833	694	3851	5.2	57	2.5	4.6
Soyabeans	910	396	-18	68	1221	4	33	596	108	2	478	0.6	7	0.6	0.3
Groundnuts (Shld Eq.)	5125	91	146	123	5238		422	2694	351	263	1508	2.0	30	1.3	2.5
Sunflowerseed	791	107	32	12	918		14	866	12	2	24	0.0	0	0.1	0.0
Rape and Mustardseed	185	30		1	215		2	198	10	0	6	0.1	0	0.0	0.1
Cottonseed	2389	63	85	315	2222	3	231	1724	25	252					
Coconuts - incl. Copra	1835	84	0	174	1745			1050	130	1	571	0.8	3	0.0	0.3
Sesameseed	579	47	86	189	523		14	169	34	0	306	0.4	6	0.2	0.6
Palmkernels	938	1	2	12	928			872	3	44	9	0.0	0	0.0	0.0
Olives	2114	2	17	49	2084			1422	63	95	504	0.7	3	0.0	0.3
Oilcrops, other	1659	54	-10	128	1575	13	72	925	97	35	446	0.6	6	0.3	0.5
Vegetable Oils	5161	3336	177	665	8009			6	33	1501	6472	8.7	209	0.0	23.7
Soyabean Oil	102	863	4	8	961					97	864	1.2	28	0.0	3.2
Groundnut Oil	1187	3	1	129	1061					18	1043	1.4	34		3.8
Sunflowerseed Oil	344	630	61	29	1007					73	934	1.3	30		3.4
Rape and Mustard Oil	68	212	25	1	304					60	244	0.3	8	0.0	0.9
Cottonseed Oil	315	26	11	12	340					16	324	0.4	11	0.0	1.2
Palmkernel Oil	396	63	0	34	425					50	375	0.5	12		1.4
Palm Oil	1756	1076	91	201	2722				33	894	1795	2.4	58	0.0	6.6
Copra Oil	121	31	0	20	131					9	122	0.2	4		0.4

F O O D B A L A N C E S H E E T

COUNTRY Africa | YEAR 1998 | POPULATION 745,138,000

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRO-DUC-TION	IM-PORTS	STOCK CHAN-GES	EX-PORTS	TOTAL	FEED	SEED	PRO-CESS-ING	WASTE	OTHER USES	FOOD	KILO-GRAMS PER YEAR	PER DAY CALO RIES	PER DAY PRO-TEIN GRAMS	PER DAY FAT GRAMS
	- 1000 METRIC TONS -														
Sesameseed Oil	78	0	0	0	78					0	78	0.1	3		0.3
Olive Oil	261	20	12	141	152					12	142	0.2	5		0.5
Maize Germ Oil	131	135	-27	13	226					12	214	0.3	7		0.8
Oilcrops Oil, other	403	279	-2	77	603			6		259	339	0.5	10	0.0	1.2
Vegetables	40250	1019	88	872	40485	132		0	3987	7	36365	48.8	34	1.7	0.3
Tomatoes	11176	741	40	398	11559			0	1101	3	10456	14.0	7	0.4	0.1
Onions	2825	65	3	188	2705				227		2479	3.3	4	0.1	0.0
Vegetables, other	26249	213	45	286	26220	132		0	2660	4	23431	31.4	23	1.2	0.2
Fruit - excluding Wine	58054	522	57	3542	55091	2457		5398	5447	23	41815	56.1	97	1.1	0.4
Oranges, Mandarines	5987	73	1	1411	4651			3	441	0	4224	5.7	5	0.1	0.0
Lemons, Limes	614	3	0	61	557				57		500	0.7	0	0.1	0.0
Grapefruit	371	12	50	196	237			0	33	1	212	0.3	0	0.0	0.1
Citrus, other	3601	7	0	14	3594			49	519		3035	4.1	3	0.1	0.0
Bananas	7095	71	0	342	6825			931	745	1	5148	6.9	11	0.2	0.0
Plantains	22257	0	0	0	22257	2384		3217	2026		14631	19.6	48	0.4	0.1
Apples - excl. Cider	1465	118	0	367	1215			11	105		1102	1.5	2	0.0	0.1
Pineapples	2127	9	0	399	1737				188	0	1554	2.1	2	0.0	0.1
Dates	1762	12	0	51	1722	73		0	138	3	1508	2.0	9	0.1	0.0
Grapes - excl. Wine	2903	46	0	242	2707	0		1133	104	3	1467	2.0	3	0.0	0.0
Fruit, other	9871	169	6	459	9588			56	1091	15	8434	11.3	14	0.2	0.1
Stimulants	3511	442	-45	2985	923			0	81	195	658	0.9	2	0.2	0.1
Coffee	1186	179	14	968	412			0	21	72	325	0.4	1	0.1	
Cocoa Beans	1877	53	-39	1630	261			0	59	120	85	0.1	1	0.0	0.1
Tea	448	209	-20	387	250				1	3	249	0.3	0	0.1	
Spices	601	56	3	93	566				22	4	543	0.7	6	0.3	0.2
Pepper	9	8	3	8	11						11	0.0	0	0.0	0.0

F O O D B A L A N C E S H E E T

COUNTRY Africa — YEAR 1998 — POPULATION 745,138,(

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRO-DUC-TION	IM-PORTS	STOCK CHAN-GES	EX-PORTS	TOTAL	FEED	SEED	PRO-CESS-ING	WASTE	OTHER USES	FOOD	KILO-GRAMS PER YEAR	PER DAY CALO RIES	PER DAY PRO-TEIN	PER DAY FAT
	- 1000 METRIC TONS -													GRAMS	GRAMS
Pimento	406	5	0	36	375				19		356	0.5	4	0.2	0.2
Cloves	23	2	-1	18	6				0	1	4	0.1	0	0.1	0.0
Spices, other	164	40	1	30	174				3	3	172	0.2	2	0.1	0.1
Alcoholic Beverages	23007	383	4	522	22872			230	971	180	21744	29.2	38	0.3	0.0
Wine	884	159	3	130	916			230	1	3	683	0.9	2	0.0	
Barley, Beer	4597	129	0	107	4620					6	4613	6.2	8	0.1	
Beverages, Fermented	17034	10	0	2	17042				970	28	16044	21.5	24	0.2	0.0
Beverages, Alcoholic	472	51	1	10	514					110	405	0.5	4		
Alcohol, Non-Food	20	34	0	273	-219					33					
Meat	10406	536	-3	134	10805	1		0		23	10790	14.5	72	5.6	5.3
Beef and Veal	3783	226	25	86	3948			0		6	3942	5.3	27	2.1	2.0
Mutton & Goat Meat	1942	44	-28	17	1942					1	1941	2.6	13	1.0	1.0
Pig meat	965	63	0	6	1023			0		1	1022	1.4	12	0.4	1.2
Poultry Meat	2556	194	0	9	2741					14	2727	3.7	13	1.3	0.9
other Meat	1160	9	0	16	1152	1		0		2	1158	1.6	6	0.8	0.2
Offals	1112	62	0	2	1173	0				44	1129	1.5	5	0.7	0.2
Animal Fats	475	564	1	44	996	17			0	374	609	0.8	17	0.0	1.9
Butter, Ghee	194	84	0	5	273					0	272	0.4	7	0.1	0.8
Cream	4	4	0	3	5						5	0.1	0	0.0	0.0
Fats, Animals, Raw	247	462	1	25	685				0	372	317	0.4	9	0.0	1.0
Fish, Body Oil	30	14	0	11	34	17				2	15	0.0	0		0.1
Fish, Liver Oil	0	0		0	0	0				0	0	0.1	0		0.0
Milk - excl. Butter	25802	5251	-79	400	30575	1255		-2	1222	376	27747	37.2	63	3.5	3.5
Eggs	1901	18	0	6	1913		187	0	133	5	1588	2.1	8	0.6	0.5

F O O D B A L A N C E S H E E T

COUNTRY Africa | YEAR 1998 | POPULATION 745,138,000

PRODUCTS	DOMESTIC SUPPLY					DOMESTIC UTILIZATION						PER CAPUT SUPPLY			
	PRO-DUC-TION	IM-PORTS	STOCK CHAN-GES	EX-PORTS	TOTAL	FEED	SEED	PRO-CESS-ING	WASTE	OTHER USES	FOOD	KILO-GRAMS PER YEAR	PER DAY CALO RIES	PER DAY PRO-TEIN GRAMS	PER DAY FAT GRAMS
	- 1000 METRIC TONS -														
Fish, Seafood	5804	2237	40	1372	3009	1384		-25	0	100	5250	7.0	14	2.1	0.5
Freshwater Fish	2030	6	0	86	1950	0		0	0	38	1912	2.6	5	0.8	0.2
Demersal Fish	764	125	1	278	612	0		-9		0	621	0.8	1	0.2	0.0
Pelagic Fish	2393	1697	31	742	3378	1357		-16		62	1975	2.7	6	0.9	0.3
Marine Fish, other	357	377	1	75	659	26				0	633	0.8	1	0.2	0.0
Crustaceans	114	9	1	65	59						59	0.1	0	0.0	0.0
Cephalopods	133	11	5	121	28					0	28	0.0	0	0.0	0.0
Molluscs, other	13	11	1	4	22			0		0	22	0.0	0	0.0	0.0
Aquatic Products, other	4	0	0	1						1	1	0.0	0	0.0	0.0
Aquatic Animals, other	4	0	0	1	3					1	1	0.0	0	0.0	0.0
Miscellaneous													1	0.1	0.1

Annex 3. Number of calories/cap/day by country during 1990-98

Country	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Africa	***2342***	***2363***	***2368***	***2380***	***2375***	***2402***	***2416***	***2403***	***2439***
Algeria	2893	2911	2973	3008	2996	3007	3031	2889	3020
Angola	1810	1773	1809	1740	1840	1871	1916	1901	1920
Benin	2279	2351	2316	2416	2383	2394	2474	2569	2571
Botswana	2325	2353	2261	2116	2236	2226	2278	2200	2159
Burkina Faso	2072	1897	2466	2441	2394	2269	2164	2169	2149
Burundi	1948	1957	1927	1839	1651	1666	1659	1669	1579
Cameroon	2196	2177	2188	2152	2115	2157	2143	2206	2209
Cape Verde	2894	3008	3147	3170	3121	3046	3027	3027	3099
Central African Republic	1925	1907	1935	1931	1932	1930	1938	2005	2056
Chad	1679	1815	1815	1785	1827	1899	1961	2027	2171
Comoros	1860	1847	1853	1813	1816	1849	1836	1853	1858
Congo, Dem Republic of	2109	2081	2065	2026	1919	1905	1799	1757	1701
Congo, Republic of	2116	2122	2176	2100	2126	2118	2116	2147	2241
Côte d'Ivoire	2512	2572	2563	2462	2463	2581	2527	2611	2695
Djibouti	1815	1796	1789	2028	1975	2118	2080	2039	2074
Egypt	3172	3186	3208	3214	3228	3262	3275	3289	3282
Eritrea				1537	1723	1677	1586	1606	1744
Ethiopia				1641	1695	1738	1878	1852	1805
Ethiopia PDR	1658	1694	1670						
Gabon	2356	2497	2498	2509	2438	2491	2501	2543	2560
Gambia	2482	2435	2475	2312	2209	2351	2418	2584	2559
Ghana	1856	2103	2212	2285	2384	2469	2568	2539	2586
Guinea	2035	2107	2232	2257	2221	2227	2288	2324	2315
Guinea-Bissau	2402	2480	2544	2430	2455	2462	2427	2435	2411
Kenya	1889	1881	1866	1789	1947	1989	1960	1980	1968
Lesotho	2242	2170	2148	2190	2175	2216	2231	2236	2210
Liberia	1922	2007	1901	1934	1969	2011	2055	1968	1979
Libyan Arab Jamahiriya	3224	3223	3206	3220	3221	3225	3225	3256	3267
Madagascar	2191	2091	2097	2085	1998	2021	2007	2015	2001
Malawi	1956	1953	1834	1990	1970	2061	2172	2114	2226
Mali	2334	2468	2143	2338	1957	2279	2284	2057	2118
Mauritania	2519	2560	2580	2586	2539	2590	2627	2632	2640
Mauritius	2882	2893	2907	2899	2968	2940	2938	2933	2944
Morocco	3148	3146	3133	3073	3206	3061	3160	3057	3165
Mozambique	1867	1713	1629	1688	1616	1752	1822	1847	1911
Namibia	2203	2233	2104	2041	2129	2070	2134	2147	2096
Niger	2151	1925	1957	1880	1904	1905	1895	1951	1966
Nigeria	2340	2477	2603	2716	2648	2703	2709	2681	2882
Rwanda	1917	2123	2126	1929	1793	1998	2037	2016	2036
Sao Tome and Principe	2110	2126	2133	2129	2148	2115	2159	2162	2201
Senegal	2320	2363	2273	2292	2284	2281	2296	2305	2277
Seychelles	2315	2387	2396	2377	2374	2437	2437	2486	2462
Sierra Leone	2019	2077	1955	1898	2026	2037	2058	2039	2045

Somalia	1793	1609	1584	1545	1639	1557	1572	1549	1531
South Africa	2994	2937	2804	2877	2908	2930	2946	2971	2909
Sudan	2157	2196	2214	2257	2329	2387	2418	2441	2444
Swaziland	2658	2625	2624	2515	2517	2453	2473	2502	2503
Tanzania, United Rep of	2192	2175	2083	2051	2024	2005	2009	1995	1999
Togo	2459	2135	2071	2076	2030	2204	2351	2505	2513
Tunisia	3166	3158	3231	3256	3178	3207	3232	3261	3297
Uganda	2328	2289	2242	2276	2257	2284	2107	2107	2216
Zambia	2063	2068	1936	1977	1962	1941	1969	1962	1950
Zimbabwe	2156	2088	1940	2004	2106	2027	2110	2164	2153

NOTES

[1] Workable and relevant lists of primary and processed food and agricultural commodities (including the Technical Conversion Factors and food nutritive composition factors) has to be considered.

[2] File Transfer Protocol.

[3] See the data by country during 1990-1998 in annex 5.

[4] For trade data, the picture is distorted somewhat since only primary products are considered, and not those derived. In addition, generally, trade data can be officially obtained in terms of value, without the quantity.

[5] Example of sources of agricultural production in Mozambique.

[6] Example of cassava (in the case of Nigeria).

[7] Example of external trade reported with less than 6 digits of the Harmonised System of Classification (case of Mozambique).

[8] Example of cassava production reported without any specification of its nature : dried or fresh (Tanzania), sweet or not (in the case of Burundi).

[9] Example of FAO estimates presented as official in some national publications.
