UNITED NATIONS

ECONOMIC AND SOCIAL COUNCIL

(1984)

Distr. LIMITED

E/ECA/SERPD/INDIC/5
18 January 1984

ENGLISH
Original: FRENCH

ECONOMIC COMMISSION FOR AFRICA

Expert Consultation on a System of Socio-economic Indicators for African Planners

Addis Ababa, Ethiopia, 23-27 January 1984

STUDY OF THE PRESENT AND POTENTIAL USE OF SOCIO-ECONOMIC INDICATORS IN PLANNING *

(The Senegalese Experience)

Prepared by ABDOULAYE MAR DIEYE
Engineer Statistician Economist
Technical Planning Inspector

* The views expressed in this paper are those of the author and do not necessarily reflect official ECA Secretariat positions.

In the economic literature of the last 20 years the question of socio-economic indicators has occupied a relatively important place. As a new idea, it has been surrounded by the traditional aura of confusion and misunderstanding which often accompanies such ideas as they make their way in the world of social science.

If we read the economic literature and the reports and resolutions of international meetings on this subject, we shall see that there are several possible interpretations of the concept of socio-economic indicators.

In this document we do not intend to become involved in this debate. However, it may be said that a consensus is emerging to the effect that a socio-economic indicator (SEI) may be defined as the best possible statistic, or statistical function, chosen to measure the state and evolution of a complex socio-economic phenomenon.

On the basis of this conception, several approaches have been adopted to make practical use of the idea of socio-economic indicators. The most constructive are those of the United Nations, the Organization for Economic Co-operation and Development (OECD) and the British Overseas Development Council (ODC).

The United Nations approach is based on the definition of a system of socio-economic indicators while the others lay greater stress on composite indicators.

Under the leadership of Professor Morris, ODC has developed an index of the material quality of life or PQLI (Physical Quality of Life Index), which is a simple average of three indicators (infant mortality, life expectancy and literacy).

Mr. B. Camara, working at the Institut du Sahel, has gone further and produced an overall indicator that is even more exhaustive. It is the weighted geometrical average of the following six basic indicators:

- Rate of nutritional satisfaction;
- Rate of infant mortality;
- Labour productivity;
- Unemployment rate;
- Purchasing power;
- Illiteracy rate.

However attractive these theoritical formulations may appear, it is nevertheless clear that their practical application is limited for at least two reasons:

- The problem of weighting is highly debatable and difficult to solve;

- The overall nature of the composite indicators may limit the planner's field of action which essentially must be based on the behaviour of socio-economic phenomena in their most simple elements.

In this document, we shall deal mainly with systems of socio-economic indicators as instruments for analysing the socio-economic situation of a country, for defining the objectives of an economic and social development plan, for following up the implementation of the plan at the national, regional and local levels, and for throwing light on the projects, programmes and policy measures to be adopted for the purpose of achieving socio-economic progress and improving the wellbeing of peoples.

I. SOCIO-ECONOMIC INDICATORS (SEI) AS INSTRUMENTS FOR ANALYSING THE SOCIO-ECONOMIC SITUATION

The preparation of a plan always begins with the analysis of the situation existing in a given country. However, an examination of various national plans shows that such an analysis usually fails to do justice to the social situation. Obviously, planning only makes sense if it provides for the economic and social welfare of all the segments of society and entails instruments which can measure the degree of this wellbeing.

Socio-economic indicators may fulfil this function but, in order to do so, they must meet a certain number of requirements:

- They must be <u>significant</u>: an indicator must grasp the totality (or quasi-totality) of the phenomenon measured;
- They must be <u>sensitive</u>: even a slight variation in the phenomenon must be registered;
- They must be <u>unambiguous</u>: a phenomenon must be interpreted with absolute clarity;
- They must be <u>faithful</u>: the significance of a variation must not change as time goes on.

Moreover, the multiplicity of socio-economic indicators proposed in the various studies and meetings on this question show that the choice of the most representative indicators is not easy.

However, it may be accepted that for each economic and social situation there is a system of indicators that will produce the best analysis of this situation. For the African countries the following system would appear to embrace almost exhaustively the various indicators that will enable us to assess the economic and social situation:

1. Population - employment

- rate of demographic growth;
- rates of mortality, birth, fertility;
- percentage of the population under 15;
- percentage of urban and rural population;
- distribution of the population employed in the rural sector;
- rate of economic activity.

2. Health - nutrition

- life expectancy at birth by sex and milieu;
- rate of infant mortality by sex and urban and rural areas;
- rate of infant and child mortality in both sexes;
- number of doctors and pharmacists per 10,000 inhabitants;
- number of women per gynaecologist, midwives, nurses and matrons;
- number of inhabitants per hospital bed;
- rate of occupation of hospital beds;
- percentage of current and capital expenditure;
- health stations.

3. Education - culture

- rate of literacy;
- rate of school enrolment;
- number of primary and secondary pupils as a percentage of the 5-14 age-group;
- percentage of boys and girls in the 15-19 age-group enrolled in secondary schools;
- percentage of males and females in the 20-24 age-group enrolled in higher education;
- distribution of students by types of training;
- proportion of budget expenditure devoted to education.

4. Transport and communications

- length of roads by type of surface in each administrative region;
- permanent roads;
- routes for opening up the country for the transport of products;
- tonnage of goods loaded and unloaded by means of transport;
- proportion of expenditure on transport and communications in the State budget and the GDP.

5. Economy

- GDP per capita at current and constant prices;
- structure of the balance of payments;
- value and quantity of exports and imports over a given period by countries of destination and origin for each product (per year/quarter);
- agricultural production per capita;
- stock-raising, forestry and fisheries production;
- rate of meeting cereal needs in the production zones;
- rate of value added;
- trend of domestic credit and sectoral distribution of credit;
- relationship debt servicing/fiscal receipts or export receipts.

5. Housing - ecology-environment

- rate of destruction of forests;
- rate of desertification;
- rate of degeneration and regeneration of agricultural land in terms of crop varieties;
- rate of utilization of firewood;
- rate of exploitation of agricultural land, forests and grazing land;
- number of dwellings built (luxury, intermediate, cheap housing).

Clearly, for a given country, these indicators are not always available and there is a strong correlation between some of them. For planning purposes a "second best" procedure would be to reduce the indicators which have a correlation between 0.8 and 1 and to work on the basis of a smaller number of indicators.

A. SOCIO-ECONOMIC INDICATORS AS PLANNING INSTRUMENTS

II. SOCIO-ECONOMIC INDICATORS AS INTRUMENTS FOR DEFINING PLAN OBJECTIVES AND CHOICE OF PROJECTS

In many developing countries, the social situation is very often the incidental result of the economic situation. In these countries planning and economic policy consist in seeking solutions to the conventional economic problems which arise as a result of the breakdown of certain macro-economic balances such as:

(a) The current balance;
(b) The balance of external payments;
(c) Public finances;
(d) The level of domestic savings;
(e) The level and productivity of investments.

The solution of these problems leads inevitably after the plan to a certain social situation the characteristics of which could not be known before the plan.

In this sense, it may be said that in many countries the social situation is tailored to the economic situation. This may well be a political option. However, if the aim is to use planning to benefit the greatest number, this option is no longer viable. The contrary option, which would consist of adapting the economic situation to the desired social situation would not be viable either for the simple reason that certain economic and financial constraints (paucity of domestic resources, for example) would not permit it. The most judicious procedure is to obtain "feedback" between the economic and social objectives until the point of balance if found.

The conceptual framework outlined in the following table gives the planner an overall appreciation of the interaction between the socio-economic indicators (SEI), the development projects to be selected and the macro-economic objectives (MEO).

SOCIO-ECONOMIC INDICATORS					PROJECTS	MACRO-ECONOMIC OBJECTIVES				
SEI	....	SEI	.....	SEI_n		MEO	....	MEO_j	.....	MEO
					P_1					
--		o		xx	Pk	X		xxx		x
					P_e					

xxx	strong positive impact	3
xx	medium positive impact	2
x	weak positive impact	1
o	no impact	0
-	weak negative impact	-1
--	strong negative impact	-2

example of valuation

Once the SEI system has been decided upon, it may be transmitted to the sectoral planning committees with indications as to how the SEI should evolve during the period of the plan. The MEO are also transmitted to the sectoral committees. The work of these committees will be to measure the impact of the projects they propose on the SEI and the MEO. The table will then be filled in by all the sectoral committees and the overall planners will then have before them the elements that can help them to make a final selection of projects. There will naturally be a problem of "trade-off" because the economic optimum will not necessarily be equal to the social optimum. In other words, the optimal choice resulting solely from the consideration of the impact on the MEO would not be the same as that resulting from the exclusive consideration of the impact on the SEI.

In the first analysis, the table may suffice to avoid the choice of projects being made exclusively on the bias of economic criteria.

However, for the purists, the concept may be taken a little further:

for a project Pk (k = 1, ..., ..., e)

Let us give the SEI coefficients ai

with $o < ai < 1$ and $\sum_{i=1}^{n} ai = 1$

let us give the MEO coefficients bj

with $o < bj < 1$ and $\sum_{j=1}^{m} bj = 1$

The allocation of these coefficients corresponds quite simply to a basic order of importance of the SEI and MEO (the exact values of the coefficients ai and bj will be decided upon by a panel of planners).

As we have already pointed out, in all planning and formulation of economic policy there is a "trade-off" between the satisfaction of economic objectives and the satisfaction of social objectives.

Let us agree to give the social objectives a relative weighting of $q (o < q \leq 7)$ and to give the economic objectives a relative weighting of $1 - q$.

Moreover, for each project Pk, we can evaluate its impact on ISE_i; by xk, i and its impact on OME_j by yk, j (c.f. bottom of previous table) and we can calculate its overall contribution in the economy (CGEK) as follows:

$$CGEk \quad q \sum_{i=1}^{n} aixk,\ i + (1-q) \sum_{j=1}^{m} bjy_{k,j}$$

The technique of the choice of projects may then be formulated as follows:

In view of the total investment determined on the basis of the country's capacity for foreign borrowing, its capacity for domestic financing and its absorptive capacity, the projects will be chosen in the light of this total by decreasing order of CGE.

This portfolio of projects thus chosen may be called the optimal portfolio in the sense of the norms selected by the planners or the economic policy-makers (i.e. in view of the values given to the coefficients ai, bj and q)

III. STUDY OF CASES

(Classification of projects and simulations on the basis of the values of the parameter g)

Let us classify the projects in the primary sector as follows:

P_1 = Poultry project in a region of the interior	100,000,000 FCFA
P_2 = Horticultural project	150,000,000 FCFA
P_3 = Fish-drying factory	700,000,000 FCFA
P_4 = Installation of a solar pump in a region of the interior	80,000,000 FCFA
P_5 = Small rice-growing area in a region of the interior	120,000,000 FCFA

The socio-economic indicators chosen for the primary sector will be:

SEI_1 = Food self-sufficiency

SEI_2 = Vegetation cover

SEI_3 = Environment

SEI_4 = Regionalization

SEI_5 = Integration of women in the development process

The macro-economic objectives will be:

MEO_1 = Economic growth

MEO_2 = Equilibrium of commercial balance

MEO_3 = Equilibrium of public finances

MEO_4 = Increased productivity of investments

MEO_5 = Development of domestic savings

The following table gives the valuations $X_{i,k}$, $Y_{j,k}$ (work of the sectoral planning committees after adjustment by the overall group responsible for the final choice of projects).

According to the values of q, we can calculate the CGE (overall contribution to the economy) of these projects:

q / CGE	0	0.2	0.5	0.8	1
P_1	0.3	0.86	0.65	0.44	1.0
P_2	0.9	1.38	1.20	1.02	1.5
P_3	1.2	0.56	0.80	1.04	0.4
P_4	0.3	1.18	0.85	0.52	1.4
P_5	1.1	1.50	1.35	1.20	1.6

We thus have the following possible classifications:

C_1 (conventional classification by order of declining costs: P_3, P_2, P_5, P_1, P_4

C_2 (q = 0, purely economic criteria) : P_3, P_5, P_2, P_1, P_4

C_3 (q = 0,2) : P_5, P_2, P_4, P_1, P_3

C_4 (q = 0,5) : P_5, P_2, P_4, P_3, P_1

C_5 (q = 0,8) : P_5, P_3, P_2, P_4, P_1

C_6 (q = 1, purely social criteria) : $P_5, P_2, P_4, P_1 P_3$

The C_1 type classification is found in many plans

SEI_1	SEI_2	SEI_3	SEI_4	SEI_5	PROJECTS	MEO_1	MEO_2	MEO_3	MEO_4	MEO_5
$a_1 = 0,4$	$a_2 = 0,2$	$a_3 = 0,1$	$a_4 = 0,1$	$a_5 = 0,2$		$b_1 = 0,2$	$b_2 = 0,3$	$b_3 = 0,2$	$b_4 = 0,2$	$b_5 = 0,1$
1	0	0	2	2	P_1	0	0	0	0	3
2	1	1	0	2	P_2	1	1	0	1	2
1	0	-2	0	1	P_3	2	1	1	1	1
1	1	1	3	2	P_4	0	0	0	1	1
2	1	1	1	2	P_5	1	2	0	1	1

The C_2 type classification appears in several plans with the development of the "effects method". But it should be noted that the effects method does not give weightings to the different MEO.

The type C_6 classification is unrealistic in a country which has serious economic and financial constraints.

The C_3, C_4 and C_5 classifications show that the choice of projects varies as a function of the relative weightings which the political authorities give to the economic objectives and to the social objectives.

B. EXPERIENCE AND USE OF SOCIO-ECONOMIC INDICATORS IN SENEGAL

Senegal's experience in economic and social planning is fairly rich. Indeed since it became a sovereign nation, the country has implemented five four-year plans and is currently implementing the 1981-1985 plan which is its sixth.

In spite of the relatively long experience accumulated in planning, it should be admitted that the economic aspect has always dominated, if not eclipsed, the social aspect in Senegal's various economic and social development plans. In fact, it was only with the sixth plan that Senegalese planners introduced socio-economic indicators into the planning process. More correctly, they adopted a socio-economic approach to analysing the situation of the country, making policy options and selecting projects.

Until the fourth development plan (1973-1977), projects were selected in accordance with the C_1 type classification (in decreasing order of project cost commensurate with the total amount of investment authorized). This naturally led to a gap between approved projects and set macro-economic objectives.

In the course of the fifth plan (1977-1981), an attempt was made to streamline project selection by introducing the aspect of the impacts that selected projects would have over time. The approach was made easy to adopt by the table of inter-industrial exchanges (IIE). However, the approach has its own limitations in that it derives from the theory that (keynesian) national economy sectors or branches react to demand. Indeed, for each project the final consumption, stocks investment and export demand generated (Y) was calculated and using the Leontieff matrix (A) obtained from the IIE the project's contribution to overall production (x) and to total value added (VA) calculated as follows:

$$VA = {}_aX = {}_a(I-A)^{-1}Y \qquad (0 \leq a \leq 1)$$

Projects were then classified in decreasing order of VA. The impact on the trade balance (particularly on imports), on public finances as well as secondary impacts were very seldom considered in selecting projects.

It was therefore a C_2 type classification where ($q = 0$) having a single macro-economic objective which is the value added.

It was only during the preparation of the sixth (1981-1985) development plan that the social dimension was actually introduced into the planning process both in analysing the country's situation, defining objectives and selecting projects.

Accordingly, planning techniques were adopted to the new approach.

Twenty-six permanent national planning commissions were established by executive instrument. Eleven of these were horizontal and 15 vertical as shown in the list below:

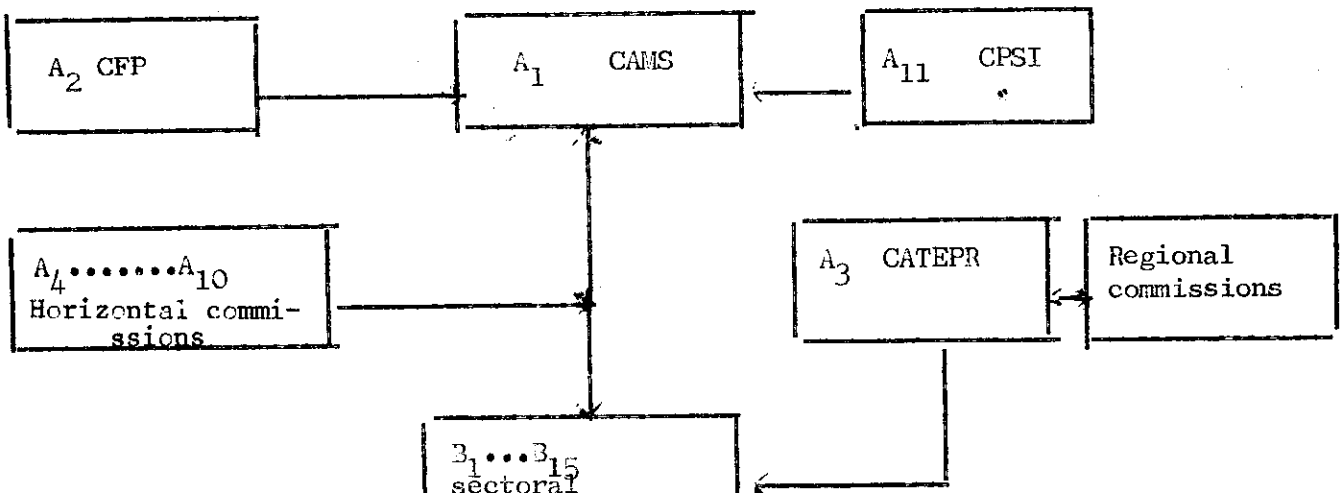
A. Horizontal commissions

1. The Macro-economic and Global analysis commission (CAMS)
2. The Public Finance commission (CFP)
3. The Physical, Environmental and Regional Planning Commissions (CATEPR)
4. The Women's Development Commission
5. The Training, Employment and Population Commission
6. The Parastatals Commission
7. The Survey and Research Commission
8. The Futurology Commission
9. The Food and Nutrition Commission
10. The Water Harnessing Commission
11. The Investment Programming and Monitoring Commission

B. Vertical commissions

1. The Agriculture Commission
2. The Animal Husbandry Commission
3. The Water and Forest Commission
4. The Fisheries Commission
5. The Hydraulics Commission
6. The Energy, Industry-mines and Handicrafts Commission
7. The Domestic and Foreign Trade Commission
8. The Tourism Commission
9. The Transport and Telecommunications Commission
10. The Urban Planning, Sewage and Habitat Commission
11. The Health Commission
12. The Formal, Higher and Supervised Education Commission
13. The Human Development Commission
14. The Cultural, Youth and Sports Commission
15. The Information Commission

The diagram below provides a simplified picture of the planning process in Senegal.



Once the A_1 synthesis commission has made a macro-economic chart of the plan with the assistance of the A_2 and A_{11} Commissions, it forwards the main macro-economic guidelines to the sectoral commissions. The innovation in the planning process is the involvement of horizontal commissions A_4 to A_{10} and Commission A_3.

Commission A_4 to A_{10} (more specifically commissions A_4, A_5, A_9) and Commission A_3 work on the environmental aspects, analysing the socio-economic situation that comes under their competence and under the control of commission A_1 set the directions to be followed together with whatever levels any existing socio-economic indicators should attain.

Commission A_3, among other things, makes sure that the concerns of the eight Regional Planning Commissions are integrated into the work of the sectoral commissions with a view to remedying regional disparities.

During preparation of the sixth plan therefore, the social situation was analysed from the standpoint of six groups of socio-economic indicators:

(a) Quantitative and structural growth of population
(b) Quantitative and structural growth of employment
(c) The status of women in the development process
(d) The food and nutrition situation
(e) Regional disparities
(f) Environment

Under (a), the population in Senegal is analysed from the three angles of region, sex and age group. There are some criterial crossings as can be seen on pages 27, 28 and 29 of the Sixth Development Plan of Senegal. The three-dimensional demographic projections made over the period of the plan are then forwarded to all sectoral commissions for integration into their work on the number of schools, houses, health training centres and so on to be built during the period covered by the plan.

Also, the projected rate of population growth in the macro-economic model makes it possible to have a lower limit for the GDP growth rate.

Under (b), manpower becomes a central variable just as capital is in any production process. Unfortunately, few development plans take this variable into account when investment is being sectoral, and regionally apportioned.

In preparing the sixth plan of Senegal, an attempt was made to reflect the manpower trend by branch of activity in the modern sector from 1971 to 1980 and by region as can be found on pages 31 and 32 of the Sixth Plan. This make it possible to evaluate by branch of activity the productivity of the labour force, the rate of remuneration, the size of the labour force (made easier to calculate by IIE surveys), in order to iron out inter-sectoral distortions and deficiencies.

The on-going regionalization of national accounting data in the Directorate of Planning will make it possible in future to conduct such analyses on a regional basis.

Under (c), the latest population census of April 1976 shows women to be accounting for more than half of the Senegalese population.

Furthermore, the stratum of women whose ages range from 20 to 64 (those potentially productive) accounts for more than 1 million potentially active people. Seventy per cent of the women live in rural areas.

In the circumstances, overall development in Senegal cannot be achieved without the active participation of women.

Unfortunately, it is difficult to secure quantitative indicators for measuring and monitoring the degree to which women have been integrated into development. In Senegal, the tendency instead is to perceive such integration through the legal status of women.

The socio-economic situation has yet to be adequately reflected in statistics. Planners therefore have no quantifiable indicators from which they can monitor, measure and influence such integration.

Planning in this area shows up more in the strengthening of legislation and regulations for better integrating women into the development process.

Under (d), a series of surveys was conducted in Senegal with a view to measuring the food and nutrition situation of the people.

Food self-sufficiency in Senegal is perceived in terms of six product groups:

- Cereals, fruits and vegetables (net domestic supply/overall consumption)
- Meat products
- Dairy products
- Fishery products
- Pulses
- Water availability/overall needs.

The projects for meeting food self-sufficiency needs are selected in line with the degree of positive impact they can have on indicators (the extent to which needs can be covered by what is available) expressed in normative - objective values.

Nutritional levels are measured in anthropometric terms, particularly by weight/size ratio which makes it possible to assess the degree of protein-energy deficiency among the people. It is also measured by the extent to which recommended nutrient supplements are satisfied as in the table below:

EXTENT TO WHICH 14 RECOMMENDED NUTRIENT SUPPLEMENTS ARE SATISFIED

AREAS	NUTRIENTS													
	Calories	Proteins	Calcium	Iron	Vitamin A	Vitamin B1	Vitamin B2	Vitamin PP	Vitamin C	Folates	Vitamin B12	Zinc	Magnesium	Copper
Dakar	96	154	42	83	81	77	39	176	223					
Louga	95	150	52	121	54	92	44	186	249					
Linguère	93	129	65	254	40	112	39	164	138					
Diourbel	99	169	150	257	142	175	75	239	280	62	262	45	849	174
Casamance	87	137	70	191	387	105	42	190	223	45	114	41	410	122
Kédougou	78	114	89	174	87	149	48	192	240	53	21	34	484	131

Under (e), the Government has endeavoured since independence to reduce regional disparities by promoting harmonious development of the country through legislative and regulatory instruments in particular:

Legislative Act 64-46 dated 17 June 1964 on public lands aims at ensuring rational exploitation of land and giving the State the means to carry out development plans;

Legislative Act 72-02 dated 1 February 1972 on national and local government reform aims at decentralization and devolution to promote popular participation in development activities, public affairs management and bringing together both rulers and the ruled through rural communities;

The new investment code (Act 81-50) initiated a value added bonus of 30 per cent for enterprises eligible under the code and located in the hinterland.

An analysis of the few regional indicators shown in the following table demonstrates however that in spite of these measures, regional disparities still persists.

Under (f), Senegal has yet to acquire quantifiable indicators for measuring the negative impact of development activities on the environment.

However there are legal provisions in the environmental code to:

- Prevent and control polution;
- Protect nature and natural resources;
- Manage human settlements;
- Provide healthy and hyginic surroundings;
- Protect historical sites and monuments;
- Provide environmental education, training and information;
- Institute co-operation in environmental matters.

Regions	Population in 1980	Density per km2	National growth rate	No. of people per hospital bed	No. of people per doctor	School going rate	Gross regional product (in million of CFA)	in Km^2
1. Cape Verde	1 098 182	1 996	3.70	290	3 278	67.1	248.8	550
2. Casamance	820 806	29	2.60	861	28 304	39.6	32.0	28 350
3. Diourbel	475 501	109	2.63	620	31 700	14.5	15.4	4 359
4. Fleuve	588 716	13	3.10	465	21 025	32.6	22.1	44 127
5. Louga	464 181	16	2.20	992	92 836	15.3	10.3	29 188
6. Senegal oriental	317 001	5	2.14	1 384	26 417	20.3	11.3	59 602
7. Sine-Saloum	1 120 825	47	2.30	653	37 361	23.5	42.3	23 945
8. Thiès	775 520	117	2.92	645	32 313	34.5	68.5	6 601
SENEGAL	5 660 732	29	2.80	544	11 843	35.8	450.7	196 722