

WEST AFRICAN FUTURES

SETTLEMENT, MARKET AND FOOD SECURITY



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AGRICULTURAL AND NON-AGRICULTURAL POPULATION

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The relative size of urban and rural populations as a proportion of the total population provides a first approximation of the ratio between food producers (mainly rural) and non-producing consumers (mainly urban). WAF notes 1 and 2 showed that regional trends in the ratio between urban (U) and rural (R) populations, the U/R ratio, can be monitored consistently once there is a standard, unchanging definition of “urban population”. However, the distinction between agricultural population (or primary population, PP) and non-agricultural population (non-primary, NPP) would be a better indicator since it would take into account a number of well-known realities. For example, the agricultural population is not exclusively rural: there are also some farmers in urban areas. Similarly, a significant proportion of rural dwellers are not food-producers. The relative proportions of food producers and non-producers vary with size of agglomeration and change with economic development. This paper aims to highlight the difficulty of measuring and monitoring the ratio between agricultural and non-agricultural populations (PP/NPP ratio), even though this indicator is essential for managing food security policy.

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1 HALF A CENTURY OF RURAL AND AGRICULTURAL CHANGE

In 1950, the urban population of West Africa was a mere 7.5% of the total population and apart from a few export crops – groundnuts, cacao, coffee – most agricultural activity was little more than subsistence farming. Apart from a few working in the public sector (administration, teaching and healthcare), rural dwellers were farmers. In those days “agricultural population” could be considered equivalent to “rural population”.

Diversification of the rural economy

Those days are over. Between 1950 and 2000, the urban population rose from 7.5% of the total to over 30%. Farming underwent major transformations, especially in areas close to urban centres. Yet for many decision-makers, “agricultural population” and “rural population” are still virtually equivalent terms. This is linked to the fact that agricultural policy has long been incorporated in rural development policy.

In the 1990s, an estimated 15% of the rural population in Sahelian countries were not making their livelihoods from agriculture.¹ Today, concordant indicators put this figure at 20-30% or more depending on the country and area concerned. The FAO points out that in rural areas the non-agricultural population is increasing much faster than the agricultural population. As urbanisation has advanced, a growing proportion of farmers have had to produce a surplus to meet demand from increasing numbers of non-producing consumers, and they have proved able to do so. This surplus has been achieved mainly by expanding farm areas and to a lesser extent by changes in production methods. More and more farmers are producing for the market, and purchasing from non-agricultural sources the tools, machinery, equipment, services and inputs they need to increase productivity. Camilla Toulmin and Bara Gueye give a good description of the development of farms

in peri-urban areas, specialising in food production for the market.²

Figure 1, taken from a study by the French Agricultural Research Centre for International Development (CIRAD), shows that even an apparently simple farming activity such as poultry production calls on numerous non-agricultural activities upstream and downstream, resulting in a “poultry complex”.

The International Food Policy Research Institute (IFPRI) has shown that the development of communication infrastructures has gone hand in hand with increased specialisation and division of labour in the rural economy and rural population, a growing proportion of which work in non-farm sectors.³ These activities upstream and downstream of farming are mainly informal and take place in both rural and urban areas.

Development of urban agriculture

Farming has also developed in and around the towns, based on rationales and farm structures very different from those of rural farmers. Urban and

peri-urban farming is practiced by town dwellers who invest and innovate expressly for the market. Prosperous market

► **A future WAF note** will address the importance of the informal sector for food security.

gardening, dairying and poultry sectors have sprung up, and are still growing, in and around all West African towns. In some towns with 5 000 inhabitants, 40% of the urban population may be farmers.

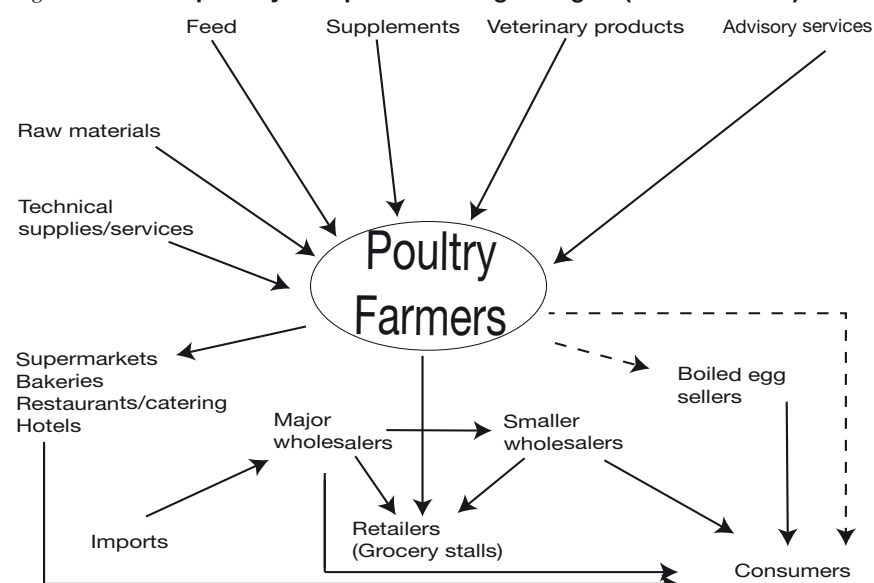
The World Bank’s 2009 World Development Report, Reshaping Economic Geography (WDR 2009), situates urbanisation within a complex “rural-urban transformation”⁴ process in which the proportion of non-farmers in rural areas rises with urbanisation and the increasing division of labour in urban areas. This trend reflects an increasing integration of agriculture into the market economy, driving productivity increases and product diversification.

To understand and support this type of transformation and the structural changes taking place in agricultural production and the market, changes in the ratio between producers and consumers need to be monitored.

⁴ Term proposed by the 2009 World Development Report.

² Toulmin C. and B. Gueye (2003), Transformation in West African Agriculture and the Role of Family Farms. SWAC, Paris.
³ Nurul Islam (1997), The Nonfarm Sector and Rural Development: Review of Issues and Evidence. A 2020 Vision for Food, Agriculture, and the Environment, IFPRI, Washington DC.

Figure 1 - The “poultry complex” in Ouagadougou (Burkina Faso)



Source: Olanrewaju B. S. et al (2004), "Développement durable de l'agriculture urbaine en Afrique francophone. Enjeux, concepts et méthodes", Cirad, Montpellier.

¹ Bakary Kanté (1992), "Les activités informelles non agricoles au Sahel", Working Paper 92-01, INSAH, Bamako.

2 THE NPP/PP INDICATOR

The ratio between non-primary population (NPP) and primary population (PP), i.e. non-agricultural versus agricultural population, meets this need. Besides the lack of precision in agricultural population data (see section 5), the mapping of the agricultural and non-agricultural population ratio reveals differences between countries (Figure 2).

In 2000, the NPP/PP ratio was higher (> 1, i.e. more than one non-producer per agricultural producer) for Nigeria, Côte d'Ivoire and Cape Verde. Trade productivity is potentially higher in these countries because the large non-agricultural population constitutes a large domestic market. NPP/PP ratio was lower (below 0.5, i.e. less than one non-producer for two agricultural producers) for the Sahelian countries and Guinea. Farmers in these countries therefore have fewer

market outlets (except for exports and non-food products). The proportions of agricultural and non-agricultural populations in the total population change in line with the growth of the towns, hence with the U/R ratio.

This trend also affects the proportion of agricultural population within the rural population. In some countries the agricultural population is larger than the rural population, a surplus that can in some cases be equated with the urban agricultural population⁵ (Table 1).

This table shows three groups of countries:

→ Countries where the agricultural population is considerably larger

than the rural population. In The Gambia, even supposing that the entire rural population worked in farming, the remaining portion of the agricultural population (equivalent to the urban agricultural population) would amount to 65% of the total urban population. This is very probably an overestimation.

→ Countries where the agricultural population is of similar size to the rural population. This is a mixed group. Ghana and Chad have very different urbanisation rates (23% for Chad and 44% for Ghana according to FAO data), a difference that ought to be reflected in the relative sizes of agricultural and rural populations, but is not. The agricultural population amounts to 98% of the rural population in Chad, but 101% in Ghana.

⁵ In the absence of more precise data, the urban agricultural population is calculated by subtracting rural population from total agricultural population.

Figure 2 – NPP/PP ratio in West Africa (2000)

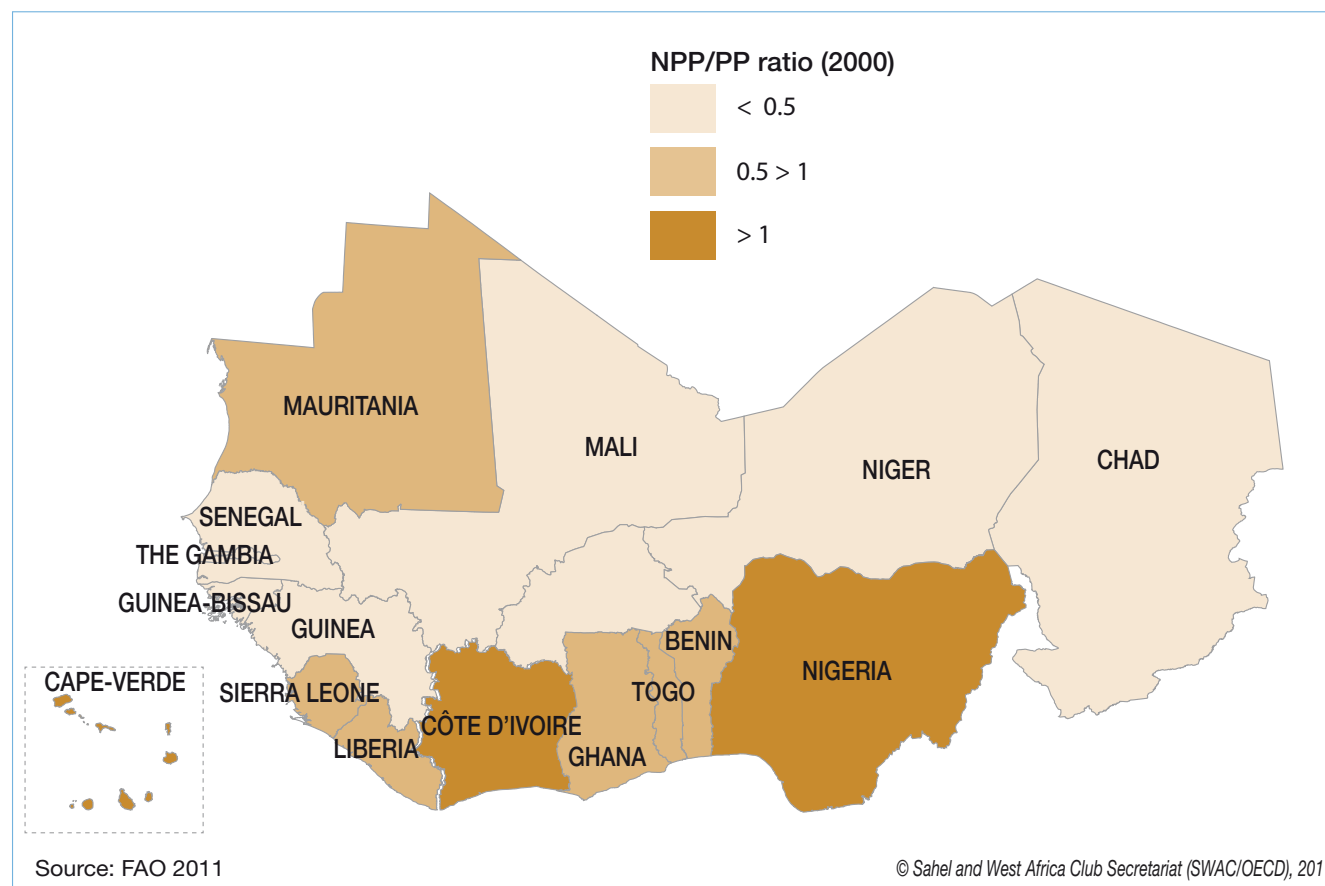


Table 1 - Agricultural population and rural population (2000)

		Rural Population (RP) ('000s)	Agricultural Population (PP) ('000s)	PP/RP (%)
Agricultural population considerably larger than rural population	The Gambia	663	1 030	155
	Liberia	1 292	1 909	148
	Senegal	5 878	7 276	124
	Guinea	5 781	7 028	122
	Guinea-Bissau	917	1 077	117
	Mali	7 591	8 489	112
	Burkina Faso	9 739	10 769	111
Agricultural population close to rural population	Niger	9 246	9 459	102
	Sierra Leone	2 727	2 749	101
	Ghana	10 945	11 011	101
	Chad	6 438	6 333	98
	Togo	3 331	3 131	94
Agricultural population considerably smaller than rural population	Mauritania	1 563	1 370	88
	Benin	4 107	3 593	87
	Côte d'Ivoire	9 757	8 427	86
	Nigeria	71 764	41 532	58
	Cape Verde	204	101	50

Source: FAO, 2011

→ Countries where the agricultural population is considerably smaller than the rural population. These countries have high urbanisation rates. Nigeria is a particularly interesting case, judging by Mortimore's well-documented 2003 analysis⁶ of trends in the agricultural population (see Figure 4 and the commentary in section 4 opposite).

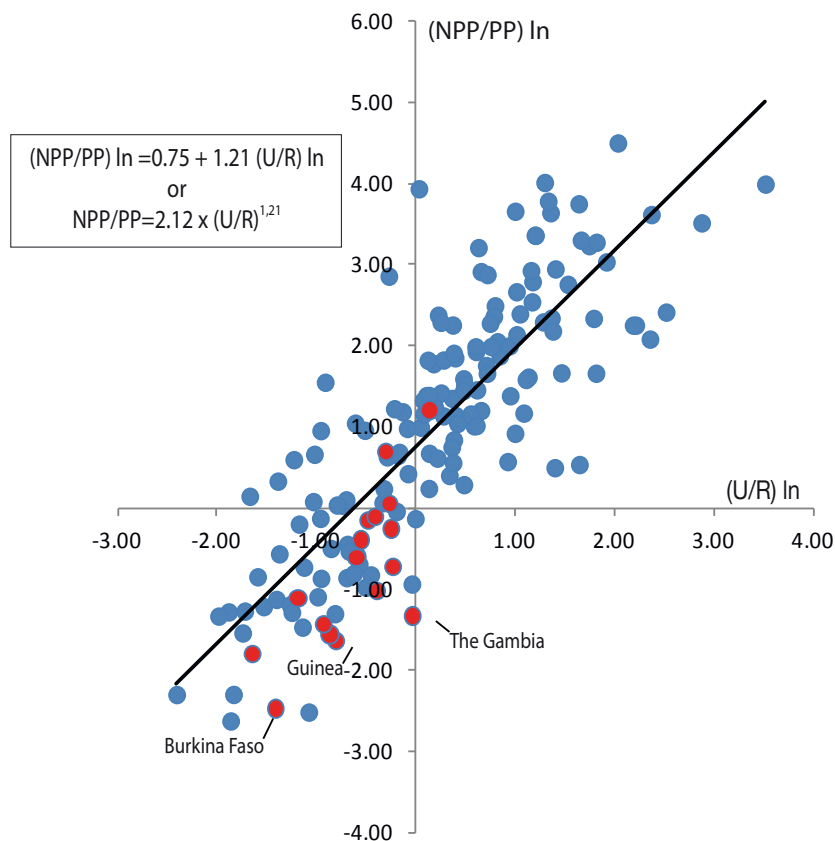
6 M. Mortimore (2003), The future of family farms in West Africa: What can we learn from long-term data?, Drylands Issue Paper No.119, IIED, London.

3 RELATIONSHIP BETWEEN NPP/PP AND U/R RATIOS

Analysis of 163 countries⁷ indicates a relatively strong correlation (R=0.83 and R²=0.7) between the NPP/PP and U/R indicators (Figure 3). This correlation shows that urbanisation has the effect of accelerating the transformation of the NPP/PP ratio. The regression line in the figure implies that the NPP/PP ratio changes faster than the U/R ratio.

Figure 3 illustrates that the 17 West African countries, shown as red dots on the figure, do not noticeably stray from the cluster of other countries. They are located towards the bottom of the regression line, as are most developing countries where U/R and NPP/PP ratios are still low. However, 15 of the 17 West African countries are below the regression line, implying that their NPP/PP ratios are smaller than would be expected in view of their urbanisation rates (U/R). For the three countries furthest from the regression line – Burkina Faso, Guinea and The Gambia – the agricultural population data are seriously inconsistent with other data (see section 5).

Figure 3 - Relationship between U/R and NPP/PP ratios (2000) for 163 countries



Source: FAO, 2011

7 City-states and the smallest island states, particularly the Pacific archipelagos, have been removed from the sample.

4 MEASUREMENT OF AGRICULTURAL POPULATION

An imprecise definition

The FAO defines the agricultural population as “All persons depending for their livelihood on agriculture, hunting, fishing and forestry. [...] This population is not necessarily an exclusively rural population.” Elsewhere, the FAO guideline on farm surveys considers that a household is a farm household if at least one of its members works in agricultural production, on their own account or on behalf of the household. This guideline is no doubt intended for accounting purposes but it leads to an overestimation of the agricultural population insofar as the household head may work in a non-farm sector.

The “economically active population in agriculture”, which the FAO defines as “that part of the economically active population that is engaged in or seeking work in agriculture, hunting, fishing or forestry” can also lead to imprecision because it includes casual farm workers. Especially in urban areas, these people may do other work and so be included in the statistics for other branches of the economy. Some countries like Senegal take temporary work into account by calculating a “full-time equivalent active population in agriculture”. The FAO data on agricultural population therefore pose problems, especially the time series, drawn up on different bases. According to the Malian Agriculture Ministry’s 2009 report on trends in agriculture and households’ living conditions in Mali⁸, the agricultural population rose from 5.9 million in 1998 to 9 million in 2001, a 50% increase in three years. This is probably due to a change in the definition of and calculation method for the agricultural population.

Two countries merit special attention: Senegal (calculation of full-time equivalent economically active agricultural population) and Nigeria (divergence

between agricultural population and rural population due to increasing urbanisation or economic trends).

Agricultural population and full-time equivalent economically active agricultural population in Senegal

In Senegal, the figure most often put forward for the economically active agricultural population is that of the 1998 national farm census: 3.4 million (Table 2).

All categories in the table, including students and temporary staff, are included in the total. No weighting is applied to take non-farm work into account.

The Agriculture Ministry’s 2009 report on trends in agriculture and households’ living conditions in Senegal⁹ makes a more detailed analysis and estimates the “full-time equivalent economically active agricultural population” at 1.6 million. This figure is used in the report to estimate value-added per economically active person in agriculture. If it is replaced by the official figure for the economically active population of 3.4 million, value-added per person drops to an abnormally low figure¹⁰ (F CFA 143 000 or

9 “Évolution du secteur agricole, des conditions de vie des ménages et de la vie chère au Sénégal”, Ministère de l’Agriculture, de l’Analyse, de la Prévision et des Statistiques (DAPS), March 2009.

10 There is also a questionable analysis according to which between 1960 and 1998, farmland area per farmer shrank and the productivity of farm work fell.

EUR 218). This explains the NPP/PP ratio for Senegal in the FAO statistics (Table 1).

Divergence between agricultural and rural populations in Nigeria between 1960 and 2000

In Nigeria, the agricultural population has not followed the same trend as the rural population. While the agricultural population continued to increase at a steady pace, reaching 63 million people in 2000, the growth of the rural population slowed abruptly and then picked up slightly to plateau at around 38.5 million (Figure 4).

The two trends diverge in the early 1970s. Is this due to a change in definition, to the effect of the country’s oil resources starting to be exploited, or to more general trends in the Nigerian economy? According to Mortimore, it reflects “The expected transition to a relatively small (and eventually smaller) agricultural labour force, which follows from urbanisation and employment diversification [...]. The agricultural population, as a percentage of total population, is estimated to have already gone into decline, and even in absolute terms has stagnated since the early 1990s” (Mortimore, 2003, p. 19).

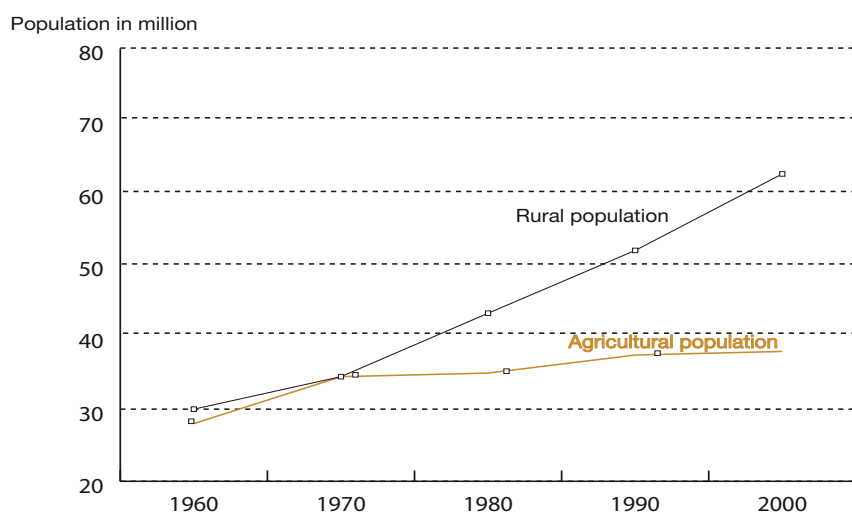
Table 2 - Agricultural labour force in Senegal (2002)

Status of persons engaged in agriculture	Number	% of persons engaged in agriculture
Family labour	2 347 000	69
Domestic help	513 000	15
Students	273 000	8
Temporary waged workers	205 000	6
Permanent waged workers	82 000	2
Total engaged in agriculture	3 420 000	100

Source: Ministère de l’agriculture – DAPS, March 2009

8 Ministère de l’agriculture du Mali (2009), “Rapport provisoire sur l’évolution du secteur agricole et les conditions de vie des ménages au Mali”.

Figure 4 - Agricultural population and rural population in Nigeria (1960-2000)



Source: Authors' calculation based on FAO et IIED data

5 DATA AVAILABILITY, CONSISTENCY AND UNIFORMITY

As with the U/R ratio (WAF notes 2 and 3), using the NPP/PP ratio to guide regional policy only makes sense if the country data are not only available but also harmonised. This is not yet the case. First, the NPP/PP ratio is not one of the standard indicators for national policy. The analysis conducted in Senegal in March 2011 under the FAO project CountrySTAT for Sub-Saharan Africa explicitly states that figures for agricultural and non-agricultural population are not included among the standard national indicators.¹¹ In addition, where these figures are calculated, they are not necessarily based on the same definition. National farm surveys are rare and are not conducted at regular intervals. In addition, farm survey results are not always consistent with general population census results.

The FAO database and the World Bank's World Development Indicators (WDI) are the only regular sources of data on all countries. And yet these data contain flagrant inconsistencies. In Burkina Faso, the agricultural population was supposedly 92% of the total population in 2010, a figure unchanged since 1980 (FAO, 2011). It

is hard to believe that the agricultural population remained steady at 92% of total population while the urban/rural ratio rose from 0.11 in 1980 to 0.25 in 2000 (WAF No. 3). In Mali, for 1961-89 agricultural population is larger than total population. The same is true of Niger from 1961 to 1973 (World Bank, WDI 2011).

Comparing the data for rural population and agricultural population for Senegal in 2002 also raises problems for interpretation and use.

The agricultural population is greatly overestimated.

Senegal's agricultural population (7.6 million in the FAO estimate) is larger than the rural population (5.8 million according to the 2002 census) – a difference of 1.8 million. This figure (agricultural population minus rural population) gives an urban agricultural population amounting to nearly 45% of total urban population. This is surely an overestimate, and is especially implausible since the Dakar

Table 3 - Agricultural population and rural population in Senegal (2002)

	Population
Total population TP (Census)	9.8 million
Rural population RP (Census)	5.8 million
Urban population UP (Census)	4 million
Agricultural population PP (FAO)	7.6 million
Non-agricultural population NPP (FAO)	2.2 million
PP – RP (considered as urban agricultural population)	1.8 million
Urban agricultural population as % of total urban population	45%
NPP/PP	0.29

Source: Ministère de l'agriculture – DAPS, report on trends in agriculture and households' living conditions, Senegal (Evolution du secteur agricole, des conditions de vie des ménages et de la vie chère au Sénégal), March 2009.

¹¹ FAO (2011) CountrySTAT for Sub-Saharan Africa, Rome.

agglomeration accounts for half the country's total urban population. The NPP/PP ratio of 0.29% seems abnormally low compared to other West African countries with the same urbanisation rate.

The Nigerian situation is different (Table 4).

According to this table, in Nigeria the NPP/PP ratio changed much faster than the U/R ratio between 1960 and 2000. The U/R ratio increased threefold in 40 years whereas the NPP/PP ratio increased sixfold over the same period. This indicates a profound transformation of the Nigerian economy and

in the productivity of the agricultural population (rising farm output with an almost steady agricultural population).

These examples show that it is impossible at present to produce a coherent regional analysis by aggregating the available data. WAF notes 1 and 2 highlighted that it is possible to obtain a rigorous measurement of the U/R ratio for the region and its trend over time, provided a standard population size threshold is adopted. The NPP/PP ratio poses a much tougher problem. It requires, first of all, that practitioners be convinced it is needed, secondly that a single definition be produced, and

thirdly that surveys be conducted. As a temporary short- and medium-term palliative measure, only modelling can supply West Africa's regional decision-makers with useful, consistent data on trends in the agricultural and non-agricultural population and the concomitant transformation of agriculture.

► **A future WAF note will be specifically devoted to population data modelling.**

Table 4 - NPP/PP and U/R indicators in Nigeria (1960-2000)

	1960	1970	1980	1990	2000
Urban population (U)	6.6	11.4	17.2	27.1	38.8
Rural population (R)	30.0	34.5	43.3	52.0	62.6
U/R ratio	0.22	0.33	0.38	0.52	0.62
Agricultural (or primary) population (PP)	28.0	34.5	35.0	37.5	38.0
Non-agricultural (or non-primary) population (NPP)	8.0	11.4	25.5	41.6	63.4
NPP/PP ratio	0.28	0.33	0.73	1.11	1.67

Source: Authors' calculation based on FAO and IIED data

Glossary

→ Agricultural population

The FAO defines the agricultural population as all persons depending for their livelihood on agriculture, hunting, fishing and forestry. It comprises all persons economically active in agriculture as well as their non-working dependents. This population is not necessarily an exclusively rural population.

→ Economically active population in agriculture

The FAO defines the economically active population in agriculture (agricultural labour force) as that part of the economically active population that is engaged in or seeking work in agriculture, hunting, fishing or forestry.

→ Peri-urban agriculture

Farming in areas close the towns, on intensive commercial or semi-commercial farms producing horticulture crops (vegetables etc.) and raising poultry and other livestock for milk and eggs.

→ Primary complex

Primary production, most of which takes place in rural areas, together with the connected sectors upstream and downstream, which take place mainly in urban areas but also in rural areas, especially if the population threshold for defining a town is higher than 5 000 inhabitants.

→ Urban agriculture

Farming on small plots of land within towns to grow a few crops and raise small livestock and dairy cows for family consumption or sale in the neighbourhood.

→ Urban and peri-urban agriculture

Farming practiced in and around the towns using resources - land, water, energy and labour - that could also serve other uses to meet the needs of the urban population; sometimes considered equivalent to horticulture.

→ Urbanisation

Process by which the percentage of urban population within total population increases.

→ Urbanisation rate

Proportion of total population living in urban areas at a given moment.

→ Urban-rural ratio (U/R)

The ratio between urban population and rural population, an unconstrained indicator (unlike the urbanisation rate, which cannot exceed 1, i.e. 100%). It can be used as a rough guide to the rural world's ability to feed the urban population.



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Your comments are welcome!

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