Data Sources and Methodology:

Total Population (P): Source 1: UN, WPP 2010: Estimations 1950-2010 for all countries except Nigeria. Source 2: SWAC/OECD, WAF 2012: Estimations 1950-2000 for Nigeria, and Projections 2000-2050 for Nigeria; Projections 2010-2050 (based on UN, WPP 2010 low population hypothesis + SWAC regional migration hypothesis).

Urban Population (U): Source 1: University Paris Diderot/CNRS/AFD, Africapolis 2008: Estimations 1950-2000 (threshold 10 000). Source 2: SWAC/OECD, 2012: Estimations 1950-2000 (threshold 5 000) + Projections 2000-2050 (threshold 5 000).

Rural Population: SWAC/OECD, 2012. Based on the sources given for total and urban population, the rural population was calculated by subtracting the urban population from the total population.

Total Population (UN): Source: UN, WPP, 2010 Revisions. For detailed information on the methodology of the United Nations Population estimates visit the [UN Population Division](#).

Urban Population (UN): Source: UN, WUP, 2011. For detailed information on the methodology of the United Nations Population estimates visit the [UN Population Division](#).

Non Agricultural Population (NAP): SWAC/OECD, 2012. Sum of rural non-agricultural population and urban non-agricultural .

Agricultural Population (AP): SWAC/OECD 2012. Sum of rural agricultural and urban agricultural population.

NAP/AP: Source: SWAC/OECD 2012. Represents the sum of urban non-agricultural and rural non-agricultural population and gives the ratio between this sum and the total agricultural population. More detail on the calculation can be found below.

NAPR/R: SWAC/OECD 2012. Represents the ratio between rural non-agricultural and total rural population.

APU/U: SWAC/OECD 2012. Represents the ratio between urban agricultural and total urban population.

Urban population growth: Based on the sources for urban population as indicated above, this data shows the urban population growth out of the total population.

Agricultural production (in kcal): Source: FAOSTAT 2010. Shows the total agricultural production in tones, converted into kilo calories.

Yield (in kcal per hectare): Source: FAOSTAT 2010 and SWAC/OECD 2012. Agricultural Production in kilo calories per agricultural areas.

Maize market surplus: Source: SWAC/OECD 2012: Net production of corn minus the auto-consummation of the producers.

Agricultural labor productivity: Source FAOSTAT 2010 and SWAC/OECD 2012: Agricultural production in kilo calories per agricultural population based on SWAC data.

Agricultural imports: Source FAOSTAT 2010: Imports of agricultural products and animals, converted in kilo calories.

Imports (share of total food supply): Source FAOSTAT 2010 and SWAC/OECD 2012: Imports in kilo calories out of the total food supply.

Agricultural area: Source FAOSTAT 2010. Agricultural area (arable land, permanent crops and permanent meadows and pastures) less 50% of the area covered by permanent meadows and pastures

in the Sahel countries (Burkina Faso, Cap-Vert, Gambia, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, Chad) in 1000 ha.

Cities > 5000/20000/50000: Source: Africapolis 2008 and SWAC/OECD 2012.
To calculate the number of towns with a threshold above 5000/20000/50000 inhabitants, Africapolis data was used as a basis. Given the population growth in the region and the simultaneous urbanization process, towns have been added for the projections based on Zipf's rank/size distribution.

The agricultural population (AP) and the ratio NAP/AP have been estimated by a model. In this model the authors assume that the agricultural population of an agglomeration with the seize V (in thousands) is given by the relation:

$$\frac{AP(V)}{V} = \frac{1}{[1+(\alpha V)]} \quad (1)$$

This relation depends on the parameter α that indicates that the probability of being dependent of agriculture decreases with an increase in average density of an agglomeration, the latter being an increasing function of the total population of the agglomeration itself.

The relation 1, for the agglomeration with size V, can be written

$$\frac{NAP}{AP} = \alpha V \quad (2)$$

For an agglomeration with size V, the relation 2 equals to assuming that the ration NAP/AP is proportional to the size V, and depend to the parameter α, where:

$$\alpha = \lambda \left[\left(\frac{U}{R} \right)^{\beta} \right] \quad (3)$$

β being the elasticity of the ratio NAP/AP relative to the variable U/R, and λ allowing to compare different agglomerations in their rank/size distribution at a given time.

The following people have contributed to the development of SMART:

Thomas Allen, Casimir Kouamé Gboko, Phillip Heinrigs, Léonidas Hittimana, Marie Trèmolieres, Johannes Weber, and Jean Marie Cour.