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Patterns of population change in Ghana (1984–2000): urbanization and frontier development

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Abstract The study addresses population dynamics in Ghana on the urban and regional levels between 1984 and 2000. At the urban level, the development trends are analyzed for urban localities (population above 5,000) on the basis of geo-coded census data. Potential driving forces for rapid population growth related to size, location, accessibility and facility counts are examined using bivariate and multivariate analysis. An index of weighted accessibility relative to other urban localities provides significant explanation at the national level, as does initial locality size. At the regional level, population development is analyzed to provide insight into the rural–urban relations. The level of urbanization is steadily increasing but varies considerably between regions. Areas of high population growth are found in some rural areas that have a remote location relative to the large urban centers. This seems to indicate the existence of 'frontier' regions, i.e. areas that experience a high degree of in-migration by people aiming to undertake specific farming activities. A high proportion of the population growth in these areas appears to take place in relatively small towns. The paper concludes with a more in-depth discussion of the development characteristics of Ghana's Western Region. This region has experienced one of the highest regional population growth rates, mainly due to its status as a 'frontier' for cocoa production.

Keywords Urban population dynamics · Frontiers · Accessibility index · Ghana

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Introduction

Population censuses were conducted in Ghana in 1960, 1970, 1984 and 2000 and many of the results are available in digital form. Projects aimed at generating digital maps of settlement and facility locations, roads and land use were undertaken from the early 1990s and onwards as part of the Ghana Environmental Resource Management Project (FCG 2007). Notwithstanding this steady increase in the number of digital data sets available in Ghana, the number of times these have been used in the analysis of spatial development trends is still limited. Efforts in this direction include Weeks et al. (2007), who provide a framework for identifying slum areas in the Accra area based on detailed geo-coded census data combined with high resolution satellite images, and Coulombe (2005), who constructs a poverty map of Ghana based on survey and census data at the sub-district level. Otiso and Owusu (2008) employ urban growth data for major urban areas in Ghana and Kenya for a thorough comparative study of historical and contemporary urbanization trends in the two countries.

The current study targets the spatial patterns of the population growth that has taken place within Ghana in the last inter-censual period, i.e. from 1984 to 2000. During this period the national population grew from 12.2 to 18.9 million, corresponding to an annual growth rate of 2.7% (GSS 2005). Urban localities are often in focus as places of rapid population growth. An urban locality is defined by the Ghana Statistical Service (GSS) as a settlement with a population of 5,000 or more, while there are no stated requirements for degree of closeness. The average annual growth rate between 1984 and 2000 of the 364 localities in Ghana defined as urban is 4.6%, which is significantly above the overall national growth rate. The fraction of the population living in urban areas was 32% in 1984, rising to 43.8% in 2000 (GSS 2002, 2005).

The two large cities Accra (population 1.66 million in 2000) and Kumasi (population 1.17 million in 2000) dominate the urban scene, while the third largest locality, Tamale, is only about one-sixth the size of Kumasi in terms of population. It is clear to any visitor to the capital of Ghana that the city has expanded remarkably. Following the implementation of liberalisation policies from 1983 to the present, many legal obstacles to investments in the housing sector were gradually removed. As a consequence, remittances from international migrants are channeled into capital investments, especially housing and land (Grant 2007). According to Yeboah (2003) the expansion of Accra is associated with relatively high-quality residential buildings owned almost exclusively by the rich. Most new areas are dominated by large housing units with surrounding parking lots and small gardens. Almost all areas are, however, in need of services and infrastructure. The localities adjoining the Accra Metropolitan Area (AMA), which were rural in 1984, attained urban status in 2000 as the result of the "spillover" of the growth of AMA—leading to very high population growth rates. This has also happened—although on a much smaller scale—near other urban areas of the country. The magnitude of urban growth in terms of area expansion has been analyzed in a previous study with specific focus on the Accra-Tema area using texture-based analysis of medium-resolution satellite imagery (Moller-Jensen et al. 2005). According to this study, the urbanized areas of Accra constituted 555 km^2 in 2002, compared to 216 km^2 in 1985, while an additional 196 km^2 were under conversion from rural to urban use by 2004. Urbanization is thus proceeding into the rural agricultural countryside, encircling the rural communities and in many cases absorbing the old villages. Consequently, all the settlements adjacent to the densely built-up city areas of Accra have witnessed a rapid population growth and a very sudden transformation from traditional rural areas to thriving urban settlements. This happens without any coherent spatial development plans, resulting in reduced accessibility and lack of basic services (Yankson et al. 2007).

The population growth taking place near the two biggest cities of Ghana is quantitatively the most important contribution to the rise in the national urbanization level. It is, however, also of interest to look at the pattern of population growth in other parts of the country in order to assess regional characteristics and differences. It is reasonable to assume that specific driving forces behind urban growth do not play an equally important role all over the country.

The current study focuses on two levels of analysis: the urban locality level and the regional level. Data from the censuses conducted in 1984 and 2000 combined with digital maps of localities, infrastructure and administrative boundaries constitute the basis for the analysis. The aim is to identify driving forces behind the high population growth experienced in some locations by determining whether specific values or value intervals of a set of predictor variables are associated with the most rapid population growth. On the urban level, the population development is analyzed for urban localities (i.e. with populations above 5,000) using geo-coded census data. Potential driving forces for rapid population growth related to size, location, accessibility and facility counts are examined using bivariate cross-tabulations and binary logistic regression. An advantage of binary logistic modeling is its exploratory power in connection with a set of spatially related predictor variables (Gobin et al. 2002). Binary regression analysis is chosen for this study based on a priori assumptions concerning the type of relationships that exist between predictor variables such as proximity indexes and the dependent variable. It was expected that localities of high growth rate could be related to certain proximity categories but no general assumptions concerning a type of linear relationship between proximity values and growth rates were made.

On the regional level, the development trends are analyzed for the 110 districts covering Ghana in 2000. Census data aggregated to the district level provide insight into the population trends of the rural areas when contrasted with the urban growth figures and provide a framework for interpreting them. An initial assumption is the existence of 'frontier' areas, i.e. areas that experience a high degree of in-migration by people aiming to undertake certain specific activities—in Ghana, often related to farming—for which the local conditions are expected to be beneficial.

This kind of in-migration to certain areas may lead to an above average population growth that is reflected in the census data. Migrants will often choose to locate in villages or relatively small towns of which many are not—yet—formally urban in order to take part in the agricultural production that is the reason behind their migration (Pedersen 1997). Results obtained on urban and regional levels are compared in the final discussion in order to assess whether such areas can be identified by the census data.

Data sources

Census data

The results of the 2000 population census have been published in several volumes. A digital version, also including data from 1970 and 1984, has been established but is not generally available to the public. A special data set on the 364 localities defined as urban by the year 2000 with population figures from the last three censuses has been produced by the Ghana Statistical Service (GSS 2002). Comparisons of entities like urban localities over time may prove difficult since the initial demarcation of their enumeration areas (EAs) may not incorporate the spatial growth. Hence, the population growth associated with a specific city or town may take place in a neighboring EA that was previously rural. In the Ghanaian context, the data set of urban localities has been prepared taking this issue into account by adding together data from EAs that represent an urban entity. This is, however, not fully accomplished in areas where smaller localities are absorbed by a large neighboring locality, as is the case in the Accra region.

The data set also contains the results of a facility census that was carried out in connection with the 2000 census. The information collected includes the existence of facilities such as a post office, a hospital or a secondary school. In cases where a facility type was not present within the locality, the distance to the nearest one was reported.

It is worth noticing that the 89,000 localities used for this census vary greatly in size, ranging from tiny fractions of EAs to larger aggregations of several EAs (Coulombe 2005).

Geocoding of census results

For obvious reasons, the 1970 census was not designed with GIS-based spatial analysis in mind. The censuses of 1984 and 2000 followed in the footsteps of the 1970 census, relying on island map sketches of the EA demarcations. The current need for precise geo-coding of the census data is a consequence of the emergence of GIS, which enables spatial analysis on a national scale. The current version of the census database is not linked to a digital map and it is, therefore, necessary to go through an extensive geo-coding process before any spatial analysis can be done. Depending on the analysis task, the requirements may vary from geo-coding of high level aggregations such as districts over geo-coding of localities defined as urban to detailed pinpointing of each EA. The availability of map sources for these purposes is discussed in the following.

Maps of administrative units

Historically, Ghanaian maps of administrative boundaries such as district boundaries have been of a generalized nature with smooth and imprecise boundary lines. This has left local planners with an inaccurate planning tool in connection with, for example, immunization campaigns and has set the scene for various disputes concerning the district allocation of 'remote' villages (Kofie and Moller-Jensen 2000). An effort is now being made to produce a more accurate map basis for various types of planning (Amamoo-Otchere 2006). The digital map of regions and districts used in the current study is the most recent map and one which has previously been used to implement a revision of the districts in

some regions. The map has been adjusted to reflect the district status of the 2000 census data set, and population data from 1984 and 2000 have been associated with each district using the 2000 census report, which summarizes the population figures. District and region boundaries are shown in Fig. 1b and c.

Maps of urban locations and settlements

As part of an effort to enhance the potential for environmental monitoring and national planning, a set of initiatives was launched in the early 1990s involving conversion of the existing topographic map sheets to digital format (FCG 2007). The resulting set of digital map layers includes a layer with approximately 6,000 settlement points digitized from the 1974 topographic map sheets. A major obstacle to further utilization within spatial analysis is the fact that these settlements are not linked to any of the census data sets. Due to the lack of a proper unambiguous key variable, this can only be done based on the settlement name, supported by the district and region name. It is, however, difficult to obtain a high degree of matching through an automated process since many settlement names vary in spelling and since settlements with identical or almost identical names may exist within one district.

For the current study, the 364 locations defined as urban in the 2000 census data set have been linked to the map of settlements. About 55% of these could be linked to the map automatically based on settlement name and district, while the rest had to be further investigated. About 4% did not appear on the settlement map, mainly because they did not exist as individual settlements in 1974 and were therefore added to the map. It was impossible to obtain a credible result for 12% of the locations, which were therefore omitted from further analysis. The final data set consists of 319 geo-coded urban locations with population data and facility counts (see Fig. 1a).

Additional data

To analyze the spatial context of each urban locality or district it is relevant to look at road distances to other localities. The applied digital map includes almost all roads existing in 1974, including narrow path-like roads (see Fig. 1a). The roads have been digitized from topographic map sheets produced in 1974, and ad hoc gps-based field validation indicates that the road map has a high degree of accuracy. New roads have been built since but most replace older roads, except close to the larger urban centers. Unfortunately, no attribute information is available that might help distinguish between major and minor roads or between roads that have been upgraded or repaired and those that are difficult to pass. For this reason, the inter-location distances computed for the proximity index described below are based on all roads. There is, however, no doubt that a proximity index based on true drive time would yield a different result.

Data analysis

The spatially related determinants of rapid population growth have been analyzed on the urban and regional levels. The main distinction is between areas that experience high growth rates versus areas that experience average or low growth rates. At the urban level, the dependent variable (*hpgrurb*) has been defined as a binary variable having a value of 1 for locations with an average annual population growth rate exceeding 5% between 1984 and 2000. This threshold identifies approximately 25% of the locations. At the district level, the binary dependent variable (*hpgrdis*) has been defined as having a value of 1 for districts with an annual population growth rate exceeding 4%, which identifies approximately 25% of the districts.

The two dependent variables have been analyzed with respect to a set of potential determinants related to 'geography', i.e. size and location as well as factors related to level of service provision. All spatial variables have been extracted using ArcGIS software.

Location is represented in the data analysis on several levels. Absolute location is analyzed through the *region* variable, indicating the location within one of the 10 regions. Relative location is analyzed through a proximity index described below and—for the urban localities—through an index of 'suburbanism' (*suburbindx*). This index is defined as the amount of urban population within a circular buffer zone of radius 10 km from the locality in question, i.e. a sharp distance threshold. The index will obtain a

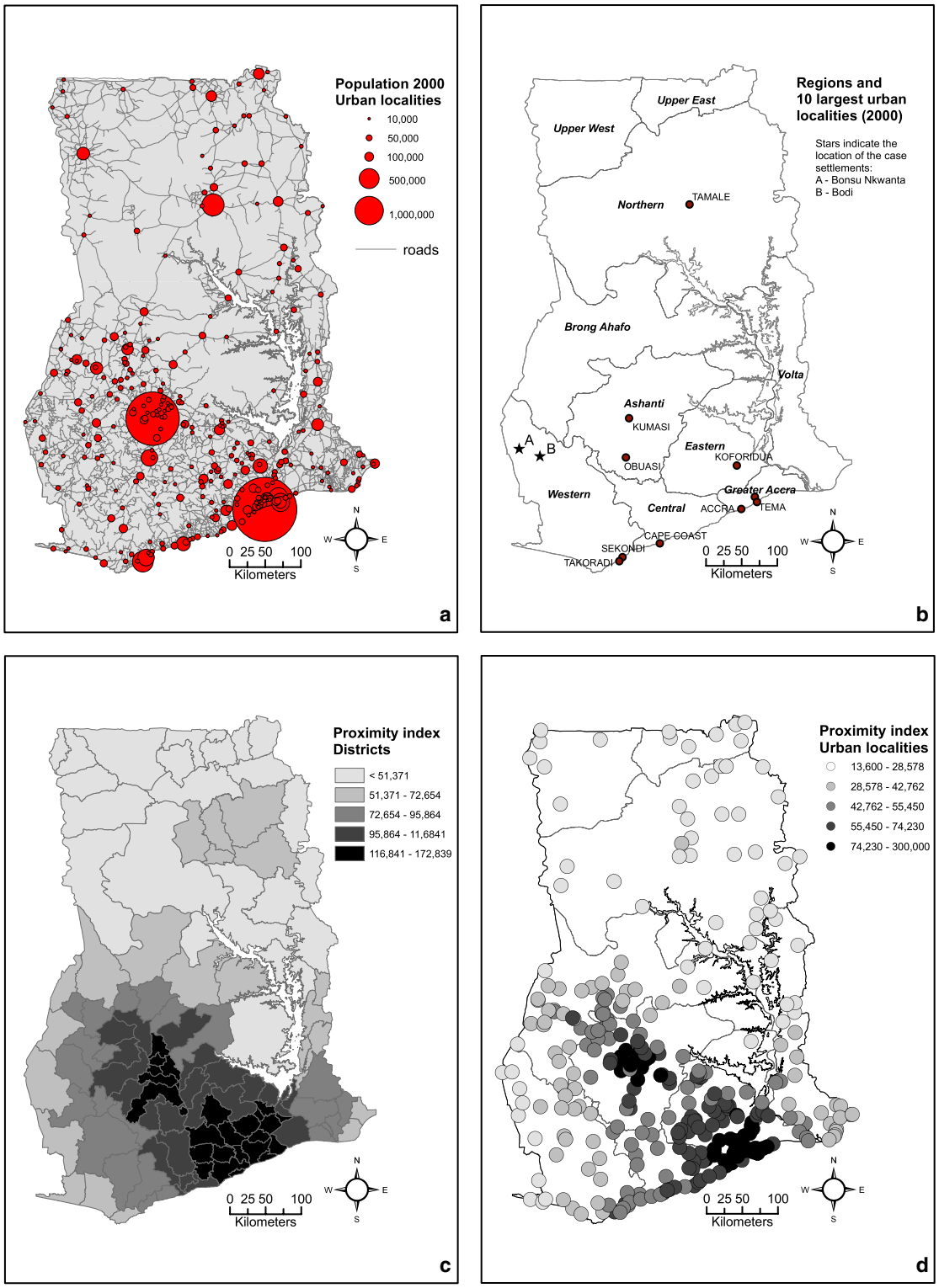

Fig. 1 **a** Road network and urban population; **b** Regions and big cities; **c** District level proximity index; **d** Urban level proximity index

high value for areas lying on the boundaries of large urban areas.

Construction of the proximity index

It is initially assumed that a high population growth is more likely in areas that are not too remote relative to high-population localities in Ghana. This assumption is examined through the computation of proximity indexes for each urban locality and each district. The applied index is a classic inverse-distance gravity model (Siegel and Swanson 2004) that captures aggregated accessibility. The index value indicates the accessibility of the location relative to the population in other locations under the assumption that the influence is reduced with increased distance (Fotheringham and O'Kelly 1989).

The index is computed using the following formula:

$$PI(i) = \sum_{j=1}^{n} \frac{W(j)}{d(i,j)}$$

where $PI(i)$ is the proximity index for locality i; $W(j)$ the population (2000) of locality j; $d(ij)$ the road distance between locality i and j; and n is the number of localities.

The urban proximity index (*proxurb*) obtains a high value if other urban areas with a high population are located at a close distance—measured in distance units through the road network between the locality in question and all other urban localities. The population of the locality itself—having a distance of 0—is not included in the index since the size of the locality is represented in a separate variable. The choice of road distances rather than straight line distances is appropriate due to the existence of natural barriers (created, for example, by the Volta Lake) that would—in many cases—result in an overestimation of proximity if straight lines were used. A related issue that has not been addressed is the great variation in possible driving speed throughout Ghana depending on road conditions, time of year etc. Figure 1d provides an indication of the spatial distribution of the index values.

In the district case, the corresponding proximity index (*proxdist*) has a high value if other districts with a high population are located at a close distance. The distance value is also in this case based on the road network. The origin and destination are, however, less obvious than for the urban case. The approach selected here is to compute the center of gravity for each district and use this point representation for inter-district distance measurements. Figure 1c shows the spatial distribution of the index.

Initial population and density

The size of the urban localities as well as the districts in terms of 1984 population (*initsize*) is included in the data analysis as a potential determinant. For the district level, a population density variable (*popdens*) is calculated by dividing the 1984 population figures with the GIS-supplied district areas values.

Service provision

The count of selected types of public and private facilities reported in the 2000 census is used to analyze whether high urban growth rates are associated with well-supplied localities. Facilities that are present in more than 90% of the urban localities have been excluded from the analysis. The remaining facilities are: Post office (*post*), Tele communication (*tele*), Hospitals (*hosp*) and Senior secondary schools (*sss*). These four types of facilities are represented by binary variables (0 = not present, 1 = present). The status of an urban location as a district or a region capital is also analyzed through the binary variables *distcap* and *regcap*.

A slightly different approach to the estimation of presence of facilities has to be taken on the district level. It is not possible from the facility census to count the number of facilities within each district since only the "present/not present" label is reported and not the actual number of facilities. The selected alternative approach is to compute the fraction of population living longer than 8 km from any of the relevant facilities based on the census data (*facprop8*). This particular distance limit reflects a political view on adequate service provision (GSS 2005). Table 1 shows the average percentage for each region concerning hospitals and secondary schools.

Exploratory bivariate statistics

As previously described, there are 319 urban localities in the data set. In order to estimate the

Table 1 Proportion of population living in urban localities and degree of service provision expressed as a percentage of population living more than 8 km from hospitals and secondary schools

	Region	Proportion urban (%)		Proportion (%) >8 km from	
		1984	2000	Hospital	Sec. school
	All regions	32.2	43.8	44.1	33.6
1	Western	22.6	36.6	51.8	47.4
2	Central	28.8	37.5	45.0	27.4
3	Greater Accra	83.0	87.7	9.7	6.9
4	Volta	20.5	27.0	60.4	34.4
5	Eastern	27.7	34.6	49.2	36.0
6	Ashanti	32.5	51.3	31.5	26.5
7	Brong Ahafo	26.6	37.4	56.4	41.1
8	Northern	25.2	26.6	69.0	58.3
9	Upper East	12.9	15.7	57.6	41.9
10	Upper West	10.9	17.5	64.1	59.2

determinants of rapid urban growth, a set of bivariate relationships was examined. The type of relationship that may exist between the independent variables and high population growth is unknown a priori. To provide an understanding of these relationships, a categorization of the ratio variables was carried out initially in order to analyze the significance of each category separately. The ratio variables *initsize* (initial population), *suburbindx* (index of 'sub-urbanism'), *proxurb* and *proxdist* (index of accessibility) have all been recoded into four categories (1–4) with 25% of the cases in each.

Concerning high urban growth rates versus proximity, the results (Table 2) show that the highest urban growth rates seem to be highly associated with the highest proximity category (4), while there are no strong relationships for the middle and low values. About 50.7% of the fast growing urban localities are in proximity category 4.

The cross-tabulation of high growth rates versus 'suburbanism' in Table 3 indicates a similar relationship: high growth rates are highly associated with the highest index category (4), while no strong relationships can be identified for the middle and low values of suburbanism.

Concerning the high urban growth rates versus initial size of the urban location, the results (Table 4) show that the highest urban growth rates seem to be associated with the 25% smallest urban localities, while there are no strong relationships concerning the larger localities. It is important to keep in mind that the set of fast growing small locations includes the fringe areas of Accra, which were predominantly rural in 1984.

Table 2 Proximity index (banded) by high urban growth rates

(#obs = 319)	Growth above 5% pa 1984–2000 (%)	
	No	Yes
Proximity index		
≤32,519	82.5	17.5
32,519–49,376	81.3	18.8
49,376–69,483	90.0	10.0
69,483+	51.9	48.1
Total	76.5	23.5

$\chi^2 = 37.2$, $p < 0.01$

Table 3 Index of suburbanism (banded) by high urban growth rates

(#obs = 319)	Growth above 5% pa 1984–2000 (%)	
	No	Yes
Index of suburbanism		
≤12,800	82.5	17.5
12,801–30,649	82.5	17.5
30,650–75,525	86.4	13.6
75,526+	53.8	46.2
Total	76.5	23.5

$\chi^2 = 29.9$, $p < 0.01$

Table 4 Initial urban population—1984 (banded) by high urban growth rates

(#obs = 319)	Growth above 5% pa 1984–2000 (%)	
	No	Yes
Population 1984		
≤3,613	28.8	71.3
3,614–5,478	88.8	11.3
5,479–8,945	96.3	3.8
8,946+	92.4	7.6
Total	76.5	23.5

$\chi^2 = 136.5$, $p < 0.01$

The bivariate relationships between presence of facility and rapid urban growth have been examined. There is an indication that the fastest growing urban locations have a lower proportion of post offices ($\chi^2 = 11.9$, $p < 0.01$), while there are no significant tendencies concerning the other three facility types. It is reasonable to assume that it is not the post office function itself that influences growth negatively. One possible justification for the identified relationship is that post offices are mainly present in historically well-established urban localities and that these localities are not strongly represented among the fastest growing urban areas. District capitals are associated with a slightly (but significantly) lower proportion of fast growing localities, while there is no tendency concerning regional capitals (Table 5). It should be noted, though, that according to GSS (2005), some of the districts capitals that appeared as a result of the creation of a number of new regions in 1988 have experienced quite rapid growth.

Concerning high urban growth rates in relation to the region of Ghana, the results (Table 6) show a higher than expected cell frequency of urban locations with high growth rates in region 3 (Accra) and a lower than expected frequency in region 5 (Eastern), 7 (Brong Ahafo) and 8 (Northern), while the rest is around the expected level.

Table 5 District capital status by high urban growth rates

(#obs = 319)	Growth above 5% pa 1984–2000 (%)	
	No	Yes
District capital		
No	73.2	26.8
Yes	84.6	15.4
Total	76.5	23.5

$\chi^2 = 4.7$, $p < 0.05$

Table 6 Region by high urban growth rates

Region	Growth above 5% pa in urban locality 1984–2000		Total
	No	Yes	
Western			
Count	27	8	35
Expected	26.8	8.2	
Central			
Count	28	6	34
Expected	26.0	8.0	
Greater Accra			
Count	10	26	36
Expected	27.5	8.5	
Volta			
Count	23	8	31
Expected	23.7	7.3	
Eastern			
Count	43	5	48
Expected	36.7	11.3	
Ashanti			
Count	39	14	53
Expected	40.5	12.5	
Brong Ahafo			
Count	38	5	43
Expected	32.9	10.1	
Northern			
Count	24	2	26
Expected	19.9	6.1	
Upper East			
Count	6	1	7
Expected	5.4	1.6	
Upper West			
Count	6	0	6
Expected	4.6	1.4	
Total			
Count	244	75	319

$\chi^2 = 62.2$, $p < 0.01$

Multivariate analysis

As some of the relationships identified above could be spurious, a multivariate, binary logistic regression

model has been used to identify causal relationships in relation to fast urban growth rates expressed as the above defined variable *hpgrurb*. The selection of predictor variables for this model is based on the bivariate analysis. The variables are screened on their ability to predict *hpgrurb* and include initial size of settlements, proximity through road network to other urban localities, index of suburbanism, status of district capital and presence of a post office (the only service facility with a significant influence according to the bivariate analysis). The variables are coded as specified:

proxurb4 (binary. 1 = cat. 4 of *proxurb*)
suburbindx4 (binary. 1 = cat. 4 of *suburbindx*)
initsize (category 1–4)
post (binary. 1 = 'present')
distcap (binary. 1 = 'status as district capital').

The model was initially run on the total data set of urban localities and the results are shown in Table 7. The overall classification accuracy of the model is 87.1% and the overall Cox-and-Snell R^2 (Cox and Snell 1989) is 0.335. All predictor variable coefficients—except presence of post office—are significant ($p < 0.05$). A low value for initial size of urban locality has a highly significant positive influence on the probability of fast growth of urban localities as does a high level of accessibility to other high population localities and a high value for the index of suburbanism.

To further investigate the robustness of the coefficients, the model was subsequently re-run without the influence of the 5% largest cities, which equals a population limit of 50,000 (Table 8). The overall classification accuracy of the model increases to 88.1% and the overall Cox-and-Snell R^2 to 0.375. The significance of the coefficients as well as their signs is maintained except for the proximity index,

Table 7 Logit model output, based on 364 urban locations

Variables	B	SE	Wald	df	Sig.	Exp (B)
Initsize	−1.614	0.219	54.318	1	0.000	0.199
Proxurb4	1.084	0.458	5.595	1	0.018	2.956
Suburbindx4	0.892	0.449	3.938	1	0.047	2.440
Distcap	1.181	0.473	6.217	1	0.013	3.256
Post	−0.196	0.455	0.185	1	0.667	0.822
Constant	1.475	0.511	8.343	1	0.004	4.371

Table 8 Logit model output, based on urban locations with less than 50,000 inhabitants

Variables	B	SE	Wald	df	Sig.	Exp (B)
Initsize	−2.049	0.283	52.403	1	0.000	0.129
Proxurb4	0.548	0.530	1.068	1	0.301	1.729
Suburbindx4	1.059	0.504	4.414	1	0.036	2.884
Distcap	1.299	0.537	5.841	1	0.016	3.664
Post	−0.203	0.468	0.189	1	0.664	0.816
Constant	2.173	0.580	14.031	1	0.000	8.785

which comes out as insignificant for the selected urban localities. The absolute coefficient value for initial size increases (from −1.6 to −2.0), indicating that a one step upward movement in size category decreases the probability of high urban growth by approximately 50%.

Population growth at the district level

There are 110 districts in the district database, reflecting the conditions at the time of the 2000 census. In order to estimate the determinants of rapid population growth at the district level, a set of bivariate relationships were examined. The predictor variables were examined with respect to the above-defined binary dependent variable *hpgrdis*. No significant relationship was found between the proximity index and fast growth rates at the district level. Similarly, no significant relationship was found between population density and fast growth rates.

The bivariate relationship between fast population growth and service provision expressed as percentage of population living within 8 km from each type of facility were examined through cross-tabulation, but no significant tendencies were identified.

Table 9 shows the regional differences concerning the proportion of fast growing districts. Region 1 (Western), 3 (Accra) and 6 (Ashanti/Kumasi) stand out as regions with a higher than expected number of fast growing districts while region 5 (Eastern) has a lower than expected number.

Regional growth versus urban growth

The results described above indicate that there are clear differences between the spatial patterns of rapid population growth at the two levels of analysis. This

Table 9 Region by high district growth rates

Region	Growth above 4% pa in district 1984–2000		Total
	No	Yes	
Western			
Count	6	5	11
Expected	8.1	2.9	
Central			
Count	0039	3	12
Expected	8.8	3.2	
Greater Accra			
Count	3	2	5
Expected	3.7	1.3	
Volta			
Count	8	4	12
Expected	8.8	3.2	
Eastern			
Count	15	0	15
Expected	11.0	4.0	
Ashanti			
Count	10	8	18
Expected	13.3	4.7	
Brong Ahafo			
Count	10	3	13
Expected	9.6	3.4	
Northern			
Count	11	2	13
Expected	9.6	3.4	
Upper East			
Count	4	2	6
Expected	4.4	1.6	
Upper West			
Count	5	0	5
Expected	3.7	1.3	
Total			
Count	81	29	110

$\chi^2 = 14.1$, $p = 0.12$

results in a faster urbanization process in some areas than in others. At the national level, the percentage of population that lives in urban localities (of more than 5,000 persons) has increased from approximately 29% in 1970 and 32% in 1984 to 44% in 2000 as recorded by the census data. The regional level data (Table 10) indicates a high degree of variability within Ghana with the urban proportion in 2000 ranging from 88% in the Accra region to values below 20% in the Upper East and Upper West regions.

This is further illustrated in Fig. 2, showing the mean annual growth rate for each region divided into urban population and rural population. For Ghana as a whole, the annual growth rate of the urban population is calculated to 4.6% compared to 1.5% for the rural population. The regional values show that the three relatively rural regions Western, Brong Ahafo and Upper West rival the high urban growth rates of the Accra and Kumasi areas. While the importance of the urbanization processes taking place around Accra and Kumasi is evident due to its magnitude in absolute numbers, the current analysis indicates that many of the fastest growing localities in other places have small populations and many have attained urban status recently or will do so in the near future. This is supported by the census data concerning all settlements in the Western District with more than 50 people in 1984: Settlements growing faster than 5% per annum had an initial average population of 341 compared to 730 for those growing less than 5% per annum. By 2000, the average size of these fast growing settlements had risen sharply to 1,100 compared to only 924 for the slower growing settlements. Concerning the 35 localities defined as urban in 2000, the average population size of those with a growth rate above 5% per annum was 4,039 in 1984 and 14,959 for the rest. According to census data from 2000, the volume of net migrants in Western region is surpassed only by the Accra area, and a high proportion (59.2%) of the urban population growth between 1984 and 2000 is thus due to migration. Only the Upper East region has a higher proportion, but the absolute figures are considerably lower there.

Population dynamics in Western Region

The population dynamics of the Western Region are discussed further below to illustrate the nature of the rapid population growth and the corresponding urbanization processes that take place beyond the direct influence of the two large urban regions of Ghana. Because the Western Region has become the main producer of cocoa in Ghana it is presently considered to be a cocoa 'frontier' area. For a

Table 10 Population, land and income data—Bodi and Bonsu Nkwanta

	Bodi	Bonsu Nkwanta
Established	1894	1970
Population size		
1984	3,379	69
2000	6,929	2,308
Estimated 2006[a]	10,000	8,000–9,000
Households with access to land	100%	51%
Average land size (acres)	21.33	11.78
Involved in cocoa farming	99%	50%
Primary source of income in 2006—average share of total household income in brackets		
Cocoa farming	98% (82%)	46% (68%)
Other farm activities	0%	3% (80%)
Non-farm activities	2% (70%)	51% (79%)

Source: 2000 Population & Housing Census (GSS 2002) and own survey data

[a] Estimated by the authors, based on interviews with key informants and observations made in the two settlements

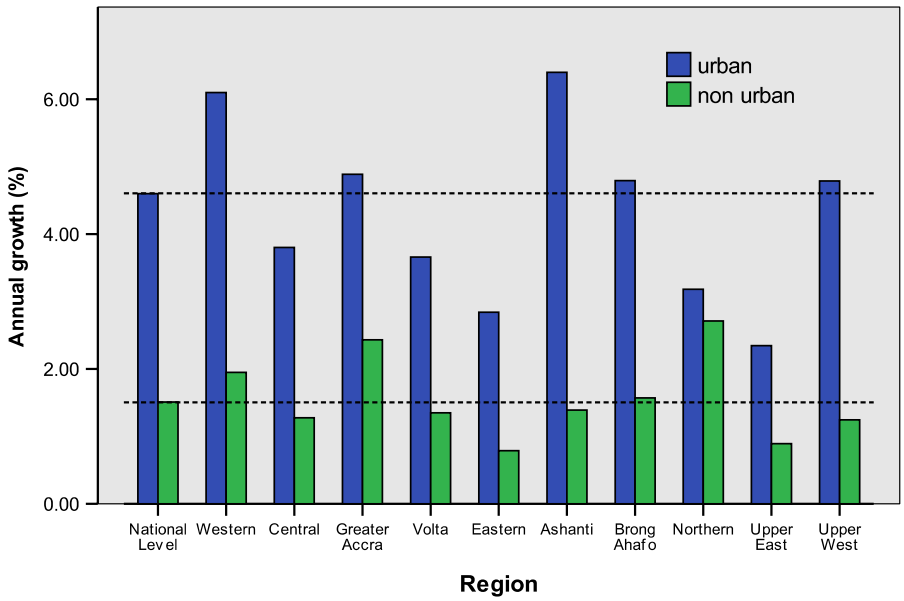

Fig. 2 Annual growth in urban and non-urban population for each region

century, the production of cocoa has been one of the most important factors determining migration patterns and settlement development in Ghana. The expansion of production has followed a distinctive geographical pattern where available tropical forest in as yet non-utilized areas was included in cocoa farming to compensate for decreasing yields in older cocoa areas (due to disease and aging cocoa farms). Generally speaking, cocoa production has moved westwards from the original area of cultivation just north of Accra, sparking the development of frontier regions by expanding throughout the Eastern Region, into the Ashanti Region and, later, into the Central and Brong-Ahafo regions (Benneh 1988).

Urban development: two case stories

To qualify the discussion of population dynamics and urbanization trends in the Western Region within the context of cocoa frontier development, we will look

more closely at two settlements, Bodi and Bonsu Nkwanta, located in the Juaboso District (see Fig. 1b). This district has one of the highest productions of cocoa in the country.

In 2000 92% of the population in the district lives in settlements of less than 5,000 (Juaboso District Assembly 2006) but the population development in the district since then has undoubtedly resulted in a higher proportion of the population in the district residing in areas which today would be defined as urban. The inflow of immigrants into the Juaboso area for agricultural purposes became notable already in the 1940s. Through the 1960s and 1970s the inflow of migrants gained momentum before exploding in the 1980s, fueled by the rapid increase in the production of cocoa; the spread of the cocoa industry as well as the collapsing cocoa frontiers in Brong Ahafo and Ashanti Regions, which forced many farmers there to migrate in search of land for farming. There were still migrants coming to the area in the 1990s with the intent of acquiring land to cultivate, but at that time, most of the forest was cleared and the prices of land had increased dramatically (Boni 2005). The Juaboso District, however, has continued to witness a remarkable development: Whereas the first five decades were dominated by migrants to the cocoa sector, the last decade has witnessed a large influx of migrants with the sole purpose of engaging in the non-farm sector[1] (see Knudsen 2007).

The description of the two settlements is based on a survey of 245 households carried out in 2005/2006. The settlements represent two different settlement types that are typical for the cocoa frontier, namely those dominated by indigenous households and those dominated by migrant households.[2] In the migrant settlement (Bonsu Nkwanta) all households included in the survey are made up of settlers in the settlement, i.e. people who have a permanent residence in the settlement and live there for most of the year. The survey does not do justice to the large number of seasonal labor migrants entering the settlements during the cocoa season. In total, 130 households were selected for the survey in Bodi, while 115 households were selected in Bonsu Nkwanta due to its estimated slightly smaller population. The selection of households was done randomly, based on stratification by location of residence.

Bodi grew significantly between the 1984 and the 2000 censuses, passing the urban threshold population of 5,000. Within the same period, Bonsu Nkwanta grew at an even higher rate, but it did not at the time of the 2000 census reach 5,000 and was therefore not defined as urban. Since the latest population census, however, Bonsu Nkwanta has experienced a remarkable population growth, resulting in the two settlements having almost the same population size in 2006 (Table 10). Both settlements have grown due to an increase in the birth rate and a decrease in the mortality rate, as well as due to the influx of migrants who want to engage in the cocoa sector and in non-farm activities. Despite having more or less the same population size, there are significant differences in how the two settlements have grown.

Bodi was established in 1894 and up until the middle of the 20th century the settlement economy was based on food stuff production mainly as a subsistence activity. Around this time, cocoa was introduced as a cash crop and the economy quickly became based on this. Despite the increasing importance of non-farm activities within the last decade, cocoa farming has remained the primary source of income for the vast majority of households in the settlement. Indeed, the survey data reveals that nearly all households earn their primary source of income from cocoa farming and that this income constitutes on average more than 4/5 of the total household income (Table 10). About 97% of the households in Bodi are indigenous, clearly indicating that the major factor for population growth is natural.

Bonsu Nkwanta was established around 1970 by a migrant farmer from the Ashanti Region. The survey data indicates that 90% of the current households are

[1] The non-farm sector/activities are defined in accordance with the definition provided by Satterthwaite and Tacoli (2003), as: '…all activities outside the agricultural sector. This excludes wage or exchange labour on other farms (sometimes classed as 'off-farm') but includes services and manufacturing related to the transformation and processing of agricultural produce, as well as non-related services and manufacturing activities' (Ibid., p. 20). It includes all forms of work taking place in a variety of locations.

[2] An indigenous household is here defined as a household that is a member of any of the resident local Sefwi matrilineages and thereby has the right to access to land for farming (Awanyo 1998). A migrant household is correspondingly defined as a household that does not belong to a local matrilineage and thereby does not have an inherited right to access to land.

migrants.[3] Initially, the production of foodstuffs and the production of cocoa were equal driving economic factors attracting mainly domestic migrants. In 1985, a market was established in Bonsu Nkwanta and in connection with an increase in cocoa output, the town has successfully developed into an important regional market center, especially in relation to trade in non-farm products. The settlement is located at the intersection of several larger rough roads providing relatively good accessibility.

The population in the settlement is still growing fast; at present most migrants are of a type that has entered the district since the late 1990s with the sole purpose to engage in non-farm activities. Thus, more than half of the survey households in the settlement currently earn their primary source of income from non-farm activities (Table 10). The importance of non-farm activities is highly affected by the seasonal cocoa economy and is hence primarily evident during the peak of the cocoa season, when the farmers are paid for their harvest. As soon as the cocoa season reaches its end, business slowly decreases. Many migrant settlers and seasonal laborers leave for their hometowns and traders relocate to more lucrative areas, leaving Bonsu Nkwanta with relatively few economic activities that take place outside the cocoa season.

The outline of two settlements in the cocoa-dominated Western Region provides clear examples of the rapid urbanization processes taking place beyond the influence of a large urban area. Most of the communities in the region are characterized by relatively low quality housing and a lack of basic services such as portable water, health facilities and quality education. The road network is sparse and of a very low quality, which hampers the potential for intra-trade activities. Although the major driving forces behind the in-migration and population growth have historically been the production of cocoa, the majority of migrants presently coming into migrant settlements such as Bonsu Nkwanta are not directly involved in the cocoa sector, suggesting that the 'non-farm sector' is gaining importance as a driving factor. As indicated above, the production of cocoa is, however, still an important factor for migration patterns and settlement development as it largely determines investments in—and purchase from—the non-farm sector.

[3] Despite the proximity of Bonsu Nkwanta and Bodi to the Ivory Coast, none of the randomly selected households included in the research were of Ivorian nationality. The main reason for this is that the study is based on settlers in the two settlements. The majority of Ivorians entering the two settlements are seasonal labour migrants or people engaged in trading during the peak of the cocoa season. However, they do not settle permanently here and are thereby not included in the research, nor are they included in the population data from GSS outlined in Table 10.

Conclusion

Several trends have been identified by the analysis of population data for the 1984–2000 inter-censual period. It is clear that the rural areas and small settlements surrounding or located close to Accra and Kumasi have experienced very rapid urbanization and this development stands out both in terms of absolute and relative growth as well as in terms of magnitude of urban sprawl. As noted in the introduction, the growth takes place largely without any overall planning and has created well-known problems related to lack of infrastructure and basic facilities.

On the national scale, the study shows that fast urban growth is often related to smaller settlements, in particular, those that are located not too remotely from areas of high population concentrations. It also shows, however, that a central location relative to population and infrastructure in some regions is of less importance than the possibility for acquiring new land for specific purposes such as cocoa production, if options are exhausted elsewhere. Consequently, some rural regions of Ghana stand out as places of very high relative growth due to the national movements of farming activities, thereby acquiring the status of 'frontier' areas.

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