

Demographic Patterns and Sustainable Development in Ghana

By E. O. Tawiah

Abstract

The paper is divided into three main sections. The first section examines some aspects of demographic patterns in Ghana. It serves as a backdrop to the discussion of the impacts of demographic patterns on sustainable development in the second section. The last section discusses immediate and decisive actions to be taken to achieve a balance between demographic patterns and sustainable development.

E. O. Tawiah, works at the Regional Institute for Population Studies, University of Ghana, Legon, Ghana.

Les Caracteristiques Demographiques et le Developpement Sostenable au Ghana

Par E. O. Tawiah

Résumé

Cet exposé est divisé en trois sections majeures. La première fait une analyse des caractéristiques démographiques au Ghana. Cela constitue la base de la discussion des caractéristiques démographiques, et les effets de celles-ci sur le développement soutenable, dans la deuxième section. La dernière section est une discussion des actions immédiates et décisives, qu'il faut exécuter afin d'établir l'équilibre précaire, entre les caractéristiques démographiques et le développement soutenable.

E.O. Tawiah, l'Institut Régional des Etudes de la Population, l'Université de Ghana, Legon, Ghana.

1. Introduction

There is a growing recognition that the present demographic patterns in sub-Saharan Africa, including Ghana, do not augur well for the achievement of sustainable development. Ghana is characterized by a youthful population, rapid population growth, uneven population distribution, high fertility and rural-urban migration. The continuing population growth in Ghana due to high fertility and declining mortality has brought human numbers into collision with resources to sustain them.

A dominant feature of population distribution is the phenomenal increase in the number of small settlements. This pattern of settlement has posed considerable difficulties for sustainable development. Rural-urban migration has given great impetus to rapid urbanization. The rapid growth of some urban centres like Accra-Tema and Kumasi has put tremendous pressure on existing infrastructural facilities and the environment.

The environment has not been spared in an attempt to promote sustainable development. The forest and forest resources have been exploited partly for the export trade and also to meet the needs of the growing population with the result that permanent signs of degradation have appeared on the horizon. The commercialization of fuelwood and charcoal coupled with poor forest management practices have led to forest depletion and degradation.

A sustainable future entails a series of interlocking issues that must be dealt with. It will be difficult to reduce the rate of population growth and stabilize the population. Poverty must be reduced. It may not be possible to improve standards of living as long as trade imbalances exist between the North and the South, and sub-Saharan African countries are burdened with heavy debt. There should be clear policies to improve women's access to education, higher earnings, credit, health and family planning services. The sub-Saharan African governments should initiate and vigorously implement environmental action plans to preserve the environment and ensure sustainable development

not only for the present but also for generations yet unborn.

The determinants and consequences of demographic patterns of sub-Saharan Africa, including Ghana, have taken centre stage in the discussions of the concept of sustainable development. There is no doubt that a lot of water has passed under the bridge since the 1974 World Population Conference at Bucharest, Romania, when developing countries forcefully advanced the thesis that "development is the best contraceptive". There is a growing recognition in sub-Saharan Africa of the need to achieve a sustainable balance between population, the environment and a decent standard of living for all the people. In other words, socio-economic development must be sustainable and capable of meeting not only present needs, but those of future generations as well. Sustainable development is an alternative to the "development at any cost" ethos identified with the drive to modernization of earlier decades (Green, 1992:4).

Both at the regional and global levels, sustainable development is imperative because the earth's limited size and finite supply of natural resources, as well as man's tendency to improve material standards of living, dictate that an unlimited population is not sustainable. The principle of sustainable development assumes an added significance in the light of tremendous efforts being made by sub-Saharan African countries to exploit abundant natural resources to pay for imports, as well as an excruciating debt.

It must be stated at the outset that although the demographic patterns of sub-Saharan Africa make it more difficult to attain development goals, other non-demographic factors like increasing poverty, political instability, wars and social strife, resource mismanagement, trade imbalances, decreasing food supply, inappropriate development patterns fostered by debt, misguided aid and even the food surpluses of the North have also frustrated attempts to improve the standard of living of the majority of the people on a sustainable basis.

2. Demographic Patterns

Because Ghana's demographic patterns to a large extent mirror those of sub-Saharan Africa, it is submitted that the issues discussed in this paper are equally applicable to the sub-region as well. A comparative framework will also be used when necessary. Ghana's demographic patterns which impinge on sustainable development include its age structure, population growth and distribution, urbanization, fertility level and rural-urban migration.

2.1 Age Structure

A population's age-sex structure conditions such characteristics as fertility and mortality, dependency ratio, potential output per head, the distribution of political power, youth-connected problems and problems connected with "ageing" of populations.

The age structure of the population of Ghana in 1960, 1970 and 1984 is presented in Table 1. It is seen that the percentage under 15 years has virtually remained unchanged during the three census periods, and this is indicative of a youthful population. This youthful age structure is typical of most sub-Saharan African countries and is largely attributed to persistently high fertility. Needless to say, this youthful population pattern has implications for sustainable development.

Table 1. Age structure by type of place of residence, Ghana 1960, 1970 and 1984

| Age group | Urban | | Rural | | Total | | |
|-------------|-------|------|-------|------|-------|------|------|
| | 1970 | 1984 | 1970 | 1984 | 1960 | 1970 | 1984 |
| Under 15 | 44.6 | 42.3 | 47.9 | 46.3 | 44.5 | 46.9 | 45.0 |
| 15-64 | 52.8 | 54.7 | 48.1 | 49.2 | 52.3 | 49.5 | 51.0 |
| 65 and over | 2.6 | 3.0 | 4.0 | 4.5 | 3.2 | 3.6 | 4.0 |

Computed from 1960, 1970 and 1984 Ghana Census Reports

2.2 Population Growth and Distribution

Perhaps one of the most spectacular aspects of modern history has been the accelerated growth of population world-wide. Ghana has also shared in this unprecedented growth of population. The population of Ghana has increased from 2,298,033 in 1921 to 12,296,081 in 1984. The estimated population in 1993 was about 16.4 million. It is worthy of note that Ghana's population size *per se* is not much of a problem. Rather, it is the rapid rate of population growth which is of much concern to all and sundry.

The recorded annual growth rates from 1921 to 1984 are shown in Table 2. It is noted that the population of Ghana increased by 43.7 per cent from 1970 to 1984, and this is equivalent to a compound rate of growth of 2.6 per cent per annum. It should be stated that unofficial sources indicate that the growth rate hovers between 2.9 per cent and 3.1 per cent per annum. The conservative growth rate of 2.6 per cent per year implies a doubling time of 27 years compared with an average of 162 years for more developed countries.

Table 2. Recorded growth rates, Ghana 1921-1984

| Period | Unadjusted annual growth rate % | | |
|-------------|---------------------------------|-------|-------|
| | Urban | Rural | Total |
| 1921 - 1931 | - | - | 3.2 |
| 1931 - 1948 | - | - | 1.6 |
| 1948 - 1960 | - | - | 4.2 |
| 1960 - 1970 | 4.7 | 1.6 | 2.4 |
| 1970 - 1984 | 3.3 | 2.3 | 2.6 |

Computed from Ghana census reports.

Population growth rates in sub-Saharan Africa are the highest of any region in the world. The 1993 estimated average

annual rate of natural increase (births minus deaths) for sub-Saharan Africa was 3 per cent. It ranges from 1.4 per cent in Mauritius to 3.6 per cent in Togo (Population Reference Bureau, Inc., 1993).

The rapid population growth experienced by sub-Saharan African countries is largely due to high fertility and declining mortality. Migration is usually not a force to reckon with in rapid population growth. Mortality levels are relatively high but are declining at a slow pace. The infant mortality rate has declined from 185 per 1,000 live births in the period 1950-1955 to 103 per 1,000 live births in 1985-1990 (United Nations, 1992). Although a reproductive revolution is taking place in sub-Saharan Africa (Robey et al., 1993) fertility is still persistently high by world standards. The 1993 total fertility rate for sub-Saharan Africa was 6.5 compared with the world's average of 3.3 (Population Reference Bureau, Inc., 1993).

The present pattern of population distribution in Ghana has its origins, to a large extent, in patterns established during the colonial era. The implementation of the first national development plan prepared by the then Governor of the Gold Coast colony, Sir Gordon Guggisberg, to cover the period 1920-1930 gave rise to the construction of infrastructural facilities to enable the mineral and agricultural resources of the country to be better exploited (Tetteh, 1992:134). It also established a pattern of settlement distribution, and set in motion processes and forces which were later reinforced by subsequent development plans and policies. The development of the railways, the expansion of the road network and the development of export crops affected the development and the distribution of human settlements.

A dominant feature of population distribution is the phenomenal increase in the number of small settlements. Increasing urbanization has gone hand in hand with an increase in the number of very small settlements. In 1960, about 8.4 per cent of the total population lived in settlements with less than 100 persons each (Tetteh, 1992:140). The proportion rose to 9.3 per cent in 1970 and the number of such settlements increased

from 20,568 in 1960 to 35,974 in 1970 and 40,079 in 1984 . It is significant to note that 40,079 out of 56,170 or 71.3 per cent of all settlements in 1984 contained less than 100 persons each (see Table 3) . Almost a million people lived in such settlements accounting for 7.7 per cent of the total population. Ninety two per cent of all settlements contained less than 500 persons each, accounting for almost 30 per cent of the total population. The proliferation of small settlements has serious implications for sustainable development.

Table 3. Distribution of settlements by size of class, Ghana, 1984

| Size of Locality | No. of Settlement | % of Settlement Population | | % of Population |
|-------------------|-------------------|----------------------------|------------|-----------------|
| Under 100 | 40,079 | 71.3 | 944,507 | 7.7 |
| 100 - 199 | 5,984 | 0.7 | 852,256 | 6.9 |
| 200 - 499 | 5,891 | 10.5 | 1,855,452 | 15.1 |
| 500 - 999 | 2,397 | 4.3 | 1,664,442 | 13.5 |
| 1,000 - 4,999 | 1,616 | 2.9 | 3,041,810 | 24.8 |
| 5,000 - 9,999 | 127 | 0.2 | 855,863 | 7.0 |
| 10, 000 - 19, 999 | 42 | 0.1 | 583,238 | 4.7 |
| 20,000 - 49,999 | 24 | 0.0 | 671,278 | 5.5 |
| 50,000 - 99,999 | 6 | 0.0 | 348,526 | 2.8 |
| 100,000 and over | 4 | 0.0 | 1,479,709 | 12.0 |
| All sizes | 56,170 | 100.0 | 12,296,081 | 100.0 |

Source: Computed from 1984 Census Report.

2.3 Urbanization

Of the four types of internal migration, it is the rural-urban type of mobility which has accelerated the process of urbanization in Ghana. The growth of towns and the rate of urbanization

became rapid with the introduction of modern economy, especially between 1948 and 1960. The number of urban centres,, defined as settlements with population of 5,000 and over,, increased from 23 in 1931 to 39 in 1948, 98 in 1960, 135 in 1970 and 189 in 1984. Urban centres thus comprised about 12.9 per cent of the total population in 1948, 23 per cent in 1960, 28.3 in 1970 and 31.3 per cent in 1984.

One significant feature of the process of urbanization is the continuous decline of the proportion of urban dwellers in small towns (5,000-9,999) from 32 per cent in 1948 to 20 per cent in 1984. The proportion of urban dwellers in large towns (100,000 and over) was 37.6 per cent in 1984. In other words, more than one out of every three urban dwellers lived in large towns. It is also significant to note that the bulk of the increase in urban population during 1960-1984 was channelled to the largest city and this underlines the primacy of Accra. In 1984, Accra-Tema alone contained 10 per cent of the total population, 30 per cent of the urban population, and more than three times the population of Kumasi, the second largest city.

2.4 Fertility Level

As far as fertility is concerned, Ghana is characterised by a persistently high fertility. The total fertility rate is yet to show any significant sign of decline. The average woman in Ghana still has more than six children, the same as two decades or so ago. Fertility in sub-Saharan Africa is almost universally high by world standards (Hill, 1990:23). The factors accounting for high fertility in Ghana and most sub-Saharan African countries include,

- (a) early and universal marriage
- (b) low use of contraception
- (c) high infant mortality
- (d) desire for large families and
- (e) children being regarded as insurance against old age.

Marriage in sub-Saharan Africa is both early and nearly uni-

versal. The 1988 Ghana Demographic and Health Survey (GDHS) indicated that the median age at first marriage for women was 16.5 years. The 1988 Zimbabwe Demographic and Health Survey indicated that more than half of the women respondents (52.3 per cent) reported that they married for the first time before their twentieth birthday, with 9 per cent saying they married before they were 15. The corresponding values for Ghana were 60.7 per cent and 10.7 per cent. Only 3.3 per cent of Zimbabwean women were 25 years or older when they married for the first time, while the corresponding percentage for Ghana was 3.1.

The pattern of nearly universal marriage is also borne out by the 1988 GDHS. For instance, of all women, 20 per cent had never married and 10 per cent were widowed, divorced or separated. In effect, 80 per cent had been in the married state and had been exposed to the risk of childbearing.

Contraceptive use is low in sub-Saharan Africa. The percentage of currently married women (15-49) currently using any modern method ranged from 1 in Burundi (1987) and Mali (1987) to 36 in Zimbabwe (1988/89). The corresponding values were 4 per cent (Ondo State, Nigeria, 1986/87), 5 per cent (Ghana, 1988), 18 per cent (Kenya, 1989), 6 per cent (Liberia, 1986) and 32 per cent (Botswana, 1988). The low contraceptive prevalence rates in sub-Saharan Africa compare with much higher rates in Latin America/Caribbean; 56 per cent (Brazil, 1986), 53 per cent (Colombia, 1986), and 44 per cent (Trinidad and Tobago, 1987).

The high fertility rate in sub-Saharan Africa may well be a demographic response to high infant mortality. There is a large body of evidence from sample surveys conducted in many sub-Saharan African countries which seems to suggest that women who have experienced child loss tend to have more children than their counterparts who have not experienced any child loss.

Behind sub-Saharan Africa's high fertility lies the strong desire for large families. Childlessness is frowned upon and is regarded as a curse and one of the greatest calamities that can befall a person. Because high premium is placed on prolific

childbearing. Among some ethnic groups, a public ceremony of congratulation is given to a mother who has achieved the rare feat of bearing 10 children. A sheep ("badugwan") is slaughtered to honour the mother among the Akans of Ghana. The custom of "Ewu-ukwu" among the Igbos of Nigeria is in honour of prolific childbearing.

3. Impacts of Demographic Patterns on Sustainable Development

Having briefly discussed some aspects of demographic patterns in Ghana, we must turn to assess some of the impacts of two demographic patterns namely, population growth and distribution, on sustainable development. The other aspects, like youthful age structure, high fertility, urbanization and rural-urban migration will not be discussed because they are closely linked with population growth and distribution. There are still enormous gaps in the scientific understanding of precisely how demographic patterns affect resources and the environment (De Sherbinin and Kalish, 1994). The complex issues in the population-environment nexus, like increasing poverty, low status of women, inappropriate economic policies, rapid population growth and unsustainable use of natural resources are difficult to disentangle given the available data and the state of the art.

The continuing population growth in Ghana and most sub-Saharan African countries has brought human numbers into collision with the resources to sustain them. There is a growing concern about the impact of population growth rate on sustainable development. For instance, Dakar/NGOs Declaration on Population, Family and Sustainable Development, which was adopted by delegates from nearly 50 African countries who attended the third African Regional Population Conference in Dakar in December 1992, calls for a reduction in the region's population growth rate from 3 per cent to 2.5 per cent by the year 2000 (Benneh, no date).

Rapid population growth has made it more difficult to preserve the forest and the forest resources for sustainable devel-

opment. Ecologically, about 82,258 km² of the total land area of Ghana is made up of forest zone, (about 34.5 per cent), while the savanna zone comprises 156,280 km² per cent. The extent of deforestation in Ghana is not specifically known, either in terms of specific location and acreage, or of the structure and composition of vegetation. However, Fleischer (1989) has estimated that much of the original forest vegetation has been removed or considerably modified, so that only some 20,000 km² of the closed forest, made up of 17,000 km² of forest reserves and between 3,000 and 5,000 km² outside the reserved area, actually remains. This fast depletion of the closed forest, which has given rise to deforestation, is due to demand for more agricultural lands to feed an ever-growing population, and increasing incidence of bush fires, logging and extraction of woodfuel to meet the energy needs of households and cottage industries.

The wood fuel is a critical issue with regard to depletion of forest resources. It has been estimated that wood fuels, mainly in the form of fuelwood and charcoal, comprised 86 per cent of all fuel used in urban households in Ghana (Nketia et. al., 1988). The commercialization of fuelwood and charcoal has given rise to forest depletion and degradation. The concern about wood fuels stems from the fact that the wood for fuel is derived mainly from natural ecosystems, with little coming from plantations and woodlots. This state of affairs, no doubt, undermines sustainability.

The rapid population growth in Ghana coupled with the concentration of infrastructural facilities and job opportunities in the urban centres has resulted in a massive rural-urban migration. The influx of people particularly into three cities--namely, Accra, Kumasi and Sekondi-Takoradi and other urban centres has brought considerable pressure on the already inadequate urban infrastructure. Basic social facilities like health, water, housing and electricity have been stretched to their breaking points. The acute housing situation in the urban centres has led to soaring rents, overcrowding and the development of slums, and the consequent degradation of the urban environment.

The environmental problems associated with urban settlements are those that have direct bearing on human health, such as basic sanitation and disposal of waste, and rampant disregard of approved land use allocations. Garbage generation in Accra city is occurring at an alarming rate, with the result that the Accra Metropolitan Assembly (AMA) is at its wits end with regards to waste collection and disposal. The rate of expansion of the cities and some urban centres, due in part to rapid population growth, has made it more difficult for town planning processes to be in step with the result that rational land use has become a herculean task.

Another issue closely related to rapid expansion in population is urban sprawl and the expansion in land use for all types of socio-economic activities. These have had a tremendous impact on the environment. The expansion of land use into rural areas has not only reduced the amount of land available for agriculture, particularly in the environs of Accra and Tema, but has also threatened the habitats of both land-based fauna and aquatic resources. It is in the light of the above consideration that the Ministry of Environment, Science and Technology recently came out with guidelines to regulate the rampant sand and stone winning activities of prospective operators.

The distribution of population and the human settlement pattern of the country pose formidable constraints to effective national development and equitable distribution of development benefits (Environmental Protection Council, 1991:54). The proliferation of small dispersed settlements has been cause for rural deprivation. Although it is rural production that sustains the economy, rural areas and the rural population have been neglected in the sharing of services, development and investments. In January 1992, the two teaching hospitals in Accra and Kumasi together had 46.6 per cent of medical doctors in the government service (Statistical Service, 1993).

Two main problems posed for sustainable development by the multiplicity of small settlements in the rural areas should be mentioned. The first relates to inadequate access to some of the basic community facilities like potable water, electricity, medi-

cal facilities and schools. The second concerns the dispersal nature of very small settlements over a wide area, which tends to lead to environmental degradation, as well as deforestation in the forest reserves caused principally by agricultural activities. It is to be noted that Northern Ghana, which is characterised by widely scattered settlements and generally lack medium sized settlements, is at a comparative disadvantage as far as attraction provisions of services to support and promote economic and social life is concerned.

At this juncture, it should be mentioned that population growth and distribution *per se* is not to take all the blame for our inability to sustain the natural resource base. The poor forest management practices pose a serious threat to the environment. The logging of different species of timber, particularly for the export trade, has been going on incessantly without any serious effort to ensure that reforestation schemes see the light of day.

4. Sustainable Development Initiatives

The previous section has highlighted some serious ramifications of demographic patterns on the well-being of Ghanaians. What are the options open to them in the short and long term? The achievement of so big a goal as sustainable development calls for a realistic approach that addresses both the direct sources of environmental degradation and indirect factors such as population growth and distribution.

In view of the pressure of sheer population numbers on natural resources and the worsening environmental degradation, particularly in the urban centres, the Government of Ghana initiated a major effort to put environmental issues on the priority agenda in March 1988. This led to the preparation of an Environmental Action Plan (EAP) in 1991 to address issues relating to the protection of the environment and better management of renewable resources. The EAP strategies of the environment include adoption of a national environmental policy, adoption of a policy agenda, natural resource management,

managing the built environment, environmental education, environmental monitoring and strengthening of institutions to implement the EAP at the national, regional, district and local levels. With the creation of the Environmental Protection Council in 1973 to advise government on environmental and related issues, it is expected that the implementation of the EAP will help to protect and preserve the resource base for use by the present as well as future, generations. Because of the complex relationship between population and the environment, it is submitted that sub-Saharan African countries should, as a matter of priority, incorporate environmental protection fully in the development process. Efforts must be made towards sustaining the environment since this is one sure way of ensuring continuous socio-economic development and better living standards.

A development strategy which is balanced between rural and urban areas is an essential component of sustainable development. In most sub-Saharan African countries development has been lopsided to the detriment of the rural areas which produce the wealth of the nation. An equitable distribution, of the benefits of development will not only ensure a more even population distribution but will also minimize rural-urban migration with its attendant socio-economic consequences.

It is high time development experts adopted the "bottom-up approach" as a strategy in achieving sustainable development. The total involvement of indigenous people and local communities in the planning, execution and monitoring of environmental programmes should be encouraged. Needless to say, they have a wealth of knowledge of traditional practices which come in handy.

Human-centred development is the basis of sustainable development and is capable of reducing poverty and population pressures on the resource base. It should be pointed out that the various economic recovery programmes so far initiated and undertaken by Ghana and some sub-Saharan African countries have not achieved the desired results. Rather, abject poverty has been woken from its deep slumber. The rampant cutting of

trees in the rural areas, particularly for household energy use, is due mainly to poverty. The recently initiated alternative strategy to encourage households to use liquified petroleum gas has not had the desired impact even in the urban areas. This is largely because the cost of liquified petroleum gas is not within the reach of the average Ghanaian urban household. In order to achieve sustainable living, a successful war must be waged on abject poverty.

Although women comprise more than half of the total population in Ghana and most sub-Saharan African countries, programmes to promote socio-economic development have often ignored women, despite their key role as suppliers of food, fuel and water for the household. Women are the main users of natural resources from their immediate environment, and therefore have a stake in preserving it. A strategy should be put in place to link women, population growth, poverty alleviation and sustainable development. This calls for clear policies to improve women's access to education, higher earnings and credit facilities. Increasing educational opportunities for women is not only good in its own right, but also because it promotes development. Increasing female education also tends to prolong age at first marriage, which in turn lowers fertility. The creation of better life options for young women would also reduce high rates of teenage pregnancy which has reared its ugly head.

Turning now to the population-sustainable development link, there is the urgent need to adopt relevant population policies as a basic strategy in sustainable development. These national policies should respond to individual and community needs with special reference to eliminating poverty and improving health, education and status of women. By 1974, only four countries namely, Botswana, Ghana, Kenya and Mauritius, had established population policies. However, in 1987 10 more countries namely, Cameroon, Senegal, Nigeria, Gambia, Burundi, Rwanda, Lesotho, Swaziland, Uganda and Zambia had joined the group of four. Although the establishment of population policies by these countries marks a welcome departure from "development is the best contraceptive" position in 1974, there

is no doubt that many countries are yet to come on board.

In the long term, slowing population growth by preventing unwanted pregnancies can contribute to the health of the environment and efforts to raise living standards of the present as well as future generations. This calls for strong support for family planning programmes. Reproductive health and family planning services should become part of efforts to conserve natural resources and improve the quality of human life.

5. Conclusion

A sustainable future involves a series of interlocking issues that must be dealt with simultaneously. It will be difficult to reduce the rate of population growth quickly unless a successful war is waged on abject poverty. It may not be possible to significantly improve living standards as long as trade imbalances exist between the North and the South, and sub-Saharan African countries are burdened with excruciating debt. The investments in health aimed at reducing infant and child mortality reduce the motivation to have large families in order to ensure survival of the lineage. Female education, especially up to the secondary level, helps to delay age at marriage, promote healthier families through better knowledge of sanitation and nutrition practices and enhances options for women's employment beyond childbearing alone. In the future, continued socio-economic development and better standards of living will depend on the continued productivity of the environment. Environmental protection, including resource management, should form an essential part of development planning.

References

- Althea Hill. 1990. "Population Conditions in Mainland Sub-Saharan Africa." Pp.3-27 in George T.F. Ascadi et al. (eds.), *Population Growth and Reproduction in Sub-Saharan Africa*. A World Bank Symposium. The World Bank, Washington D.C.

Benneh, George (no date). Demographic Changes and the Role of Government. An unpublished manuscript.

Central Statistical Office. 1989. *Zimbabwe Demographic and Health Survey 1988*. Institute for Resource Development/Macro Systems, Inc. Columbia, Maryland, USA.

De Sherbinin, Alex and Susan Kalish. 1994. "Population-Environment Links: Crucial but Unwieldy." *Population Today*. Population Reference Bureau. Washington, D.C.

Economic Commission for Africa. 1992. *Demographic Handbook for Africa*, 1992.

Environmental Protection Council. 1991. *Ghana Environmental Action Plan*, Volume 1.

Fleischer, J.E. 1989. "Population, Rangelands and Pasture in Ghana." Paper presented at the National Workshop on Population, Resources, Environment and Development in Ghana, Accra, 10-12 October, 1989.

Ghana Statistical Service. 1989. *Ghana Demographic and Health Survey 1988*. Institute for Resource Development/Macro Systems, Inc. Columbia, Maryland, USA.

— 1993. Quarterly Digest of Statistics, Vol. XI No. 2.

Green, C. P. 1992. *The Environment and Population Growth: Decade for Action*. Population Reports, Series M, No. 10. Baltimore, John Hopkins University, Population Information Programme.

Nabila, J.S. 1992. *Population Distribution and Resource Utilization in Ghana*. Regional Institute for Population Studies. Monograph Series No. 7, pp 31-81.

Nketia, K.S., E. B. Hagan and S.T. Addo. 1988. *The Charcoal Cycle in Ghana - A Baseline Study* UNDP/Nation's Energy Board, Project GHA/82/020.

Population Reference Bureau, Inc. 1993. 1993 World Population Data Sheet. PRB, Washington, D.C.

Robey, B., Shea O. Rutstein and Leo Morris. 1993. "The Fertility Decline in Developing Countries." *Scientific American*, December 1993 pp. 60-67.

Tetteh, P. A. 1992. *Population Distribution and Development Planning in Ghana*. Regional Institute for Population Studies. Monograph Series No. 7, pp. 129-170.

United Nations. 1992. *World Population Prospects: The 1992 Revision*, New York.