

## Migration, Environment and Development in Ghana

Kees van der Geest<sup>1</sup>

### Introduction

West Africa is experiencing a substantial flow of migrants from the interior savanna to the forest and coastal zones. This migration is not new, but many observers expect it to intensify due to climate change, environmental degradation, population growth, urbanization and intensifying inter-regional economic disparities. Vice versa, changes in the regional distribution of people through migration can have profound impacts on the environment and economy in migrant source and destination areas. In the long-standing and rich body of literature on human mobility in West Africa, scarcity, variability and degradation of natural resources are generally assumed to be important drivers of migration. However, in most studies, these factors are taken for granted and not subjected to critical scrutiny and empirical testing. Moreover, West African studies of human mobility have largely ignored the environmental impact of migration, especially in migrant source areas.

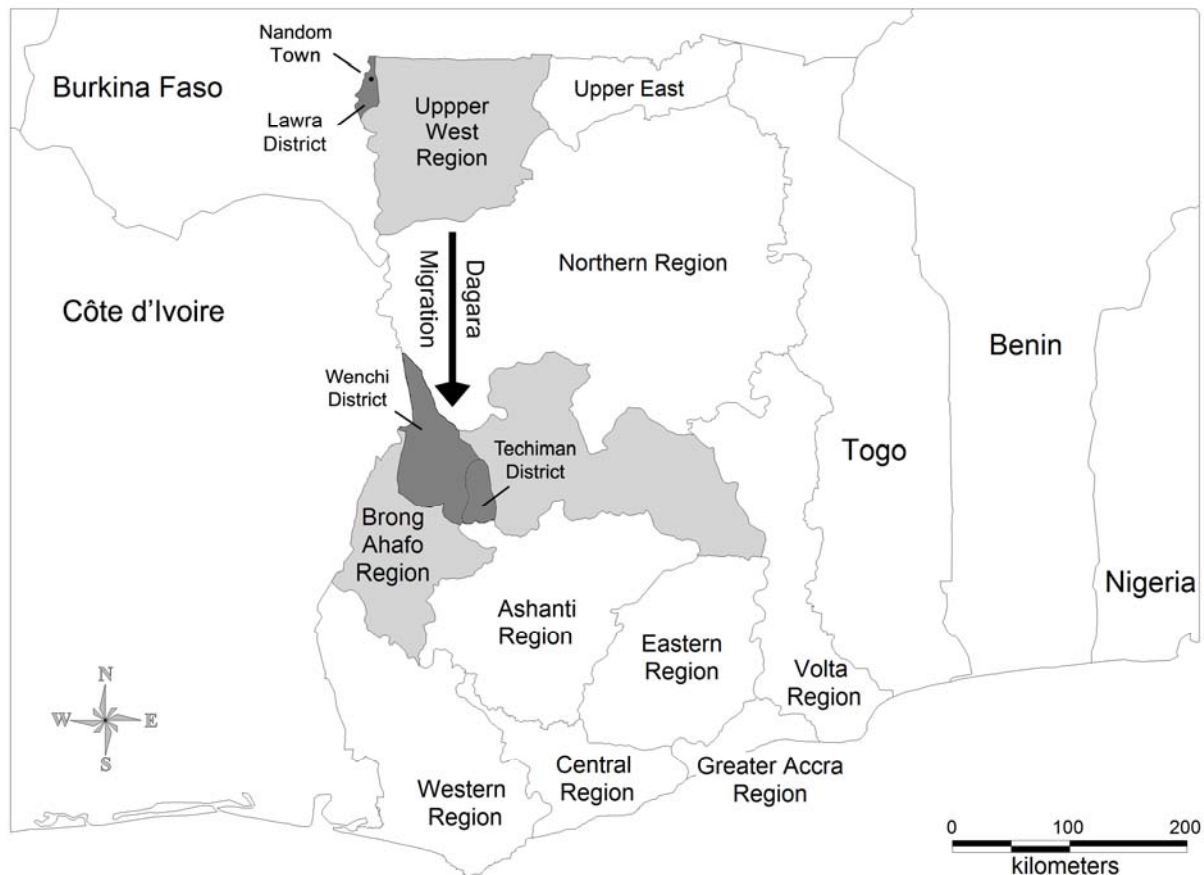
This paper summarizes the findings from a PhD research on migration, environment and development linkages in Ghana<sup>2</sup>. This study looked particularly at the domestic migration system of the Dagara people from Northwest Ghana (see Figure 1). The focus in this research is on migrant sending as well migrant receiving areas. The principal destination region of Dagara migrants is the Brong Ahafo Region in Ghana's middle belt. Contrary to most other destinations of Dagara migrants, the Brong Ahafo Region mostly attracts rural-rural migrants. Ecologically, this migration flow involves a movement from the interior savannah with one rainy season to the forest-savannah transition zone with two rainy seasons. In political-economic terms the movement is from a poor and underdeveloped periphery to a semi-peripheral food crop frontier. Three different types of migration are studied here: seasonal labour migration, long-term migration and return migration. The study sought to answer the following question: "what are the economic and environmental causes and consequences of rural migration from the Upper West Region to the Brong Ahafo region? As both areas have predominantly agricultural economies, the impact of migration on agricultural development receives most attention.

---

<sup>1</sup> Amsterdam Institute of Social Science Research, University of Amsterdam, Nieuwe prinsengracht 130, 1018 VZ Amsterdam, E-mail: [geest@uva.nl](mailto:geest@uva.nl)

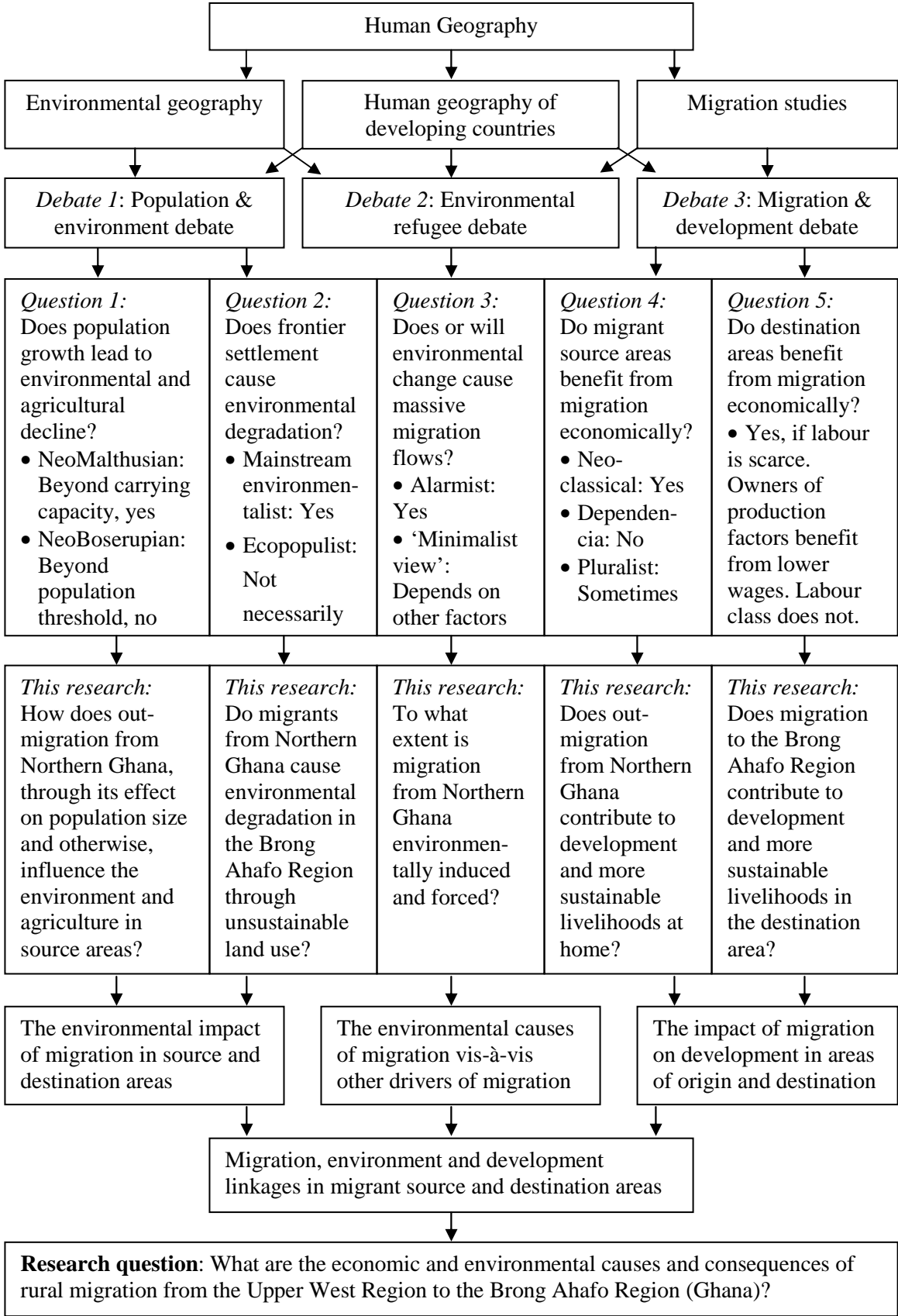
<sup>2</sup> Van der Geest, K. (2011). The Dagara farmer at home and away: Migration, environment and development in Ghana. *African Studies Collection* 33. Leiden: African Studies Centre.

Figure 1: Regional map of Ghana showing the research areas



Three academic debates are at the core of this research: the environmental refugee debate, the population-environment debate and the migration and development debate. The environmental refugee debate deals with the question to what extent human migration flows are environmentally induced and to what extent people are *forced* to relocate in response to environmental disruption. The population-environment debate is about the impact of demographic and socio-economic change on natural resources management and environmental quality. Within the broader field of population-environment studies, the Malthus-Boserup debate looks at the relation between population growth, technology and land use sustainability. The third academic debate that is central to this research deals with the impact of migration on development, particularly in migrants' areas of origin. Figure 2 shows the disciplinary embedding of this research and the connection between theory and research questions.

Figure 2: Disciplinary embedding, academic debates and research questions



A diverse set of methods and data sources, such as household questionnaires, group discussions, life histories, population censuses, satellite data and agricultural statistics, was used in this research. Throughout the study, local people's perceptions of migration and environmental change receive attention. The analyses at village level are based on case studies that were carried out in eight villages around Nandom (Lawra District, Upper West Region, see Figure 1) and in nine villages and rural towns in Wenchi District and Techiman District (Brong Ahafo Region, see Figure 1). Initially, the research design centred mostly on the household questionnaires, but in the course of the research, it became clear that migration-environment linkages needed to be validated at higher level of scale. Therefore, secondary data on migration and environmental scarcity were integrated in the analysis. This broadened the geographical scale from the local to the regional and national level. Geographic Information System (GIS) software was used to enable a spatial analysis of the relation between migration and the environment.

The structure of this paper is as follows. In the remainder of this introductory section, the Dagara people are introduced and their migration patterns and trends are described. Section 2 to 7 summarize this study's findings on different migration, environment and development linkages. Reference is made to the original journal and book publications in which these linkages are analysed in more detail. Section 8 distils findings on the impact of out-migration on environmental quality in migrant source areas (no separate article or book chapter was dedicated to this question). In the last section some overall findings on migration causes and consequences are presented.

### 1.1. The Dagara

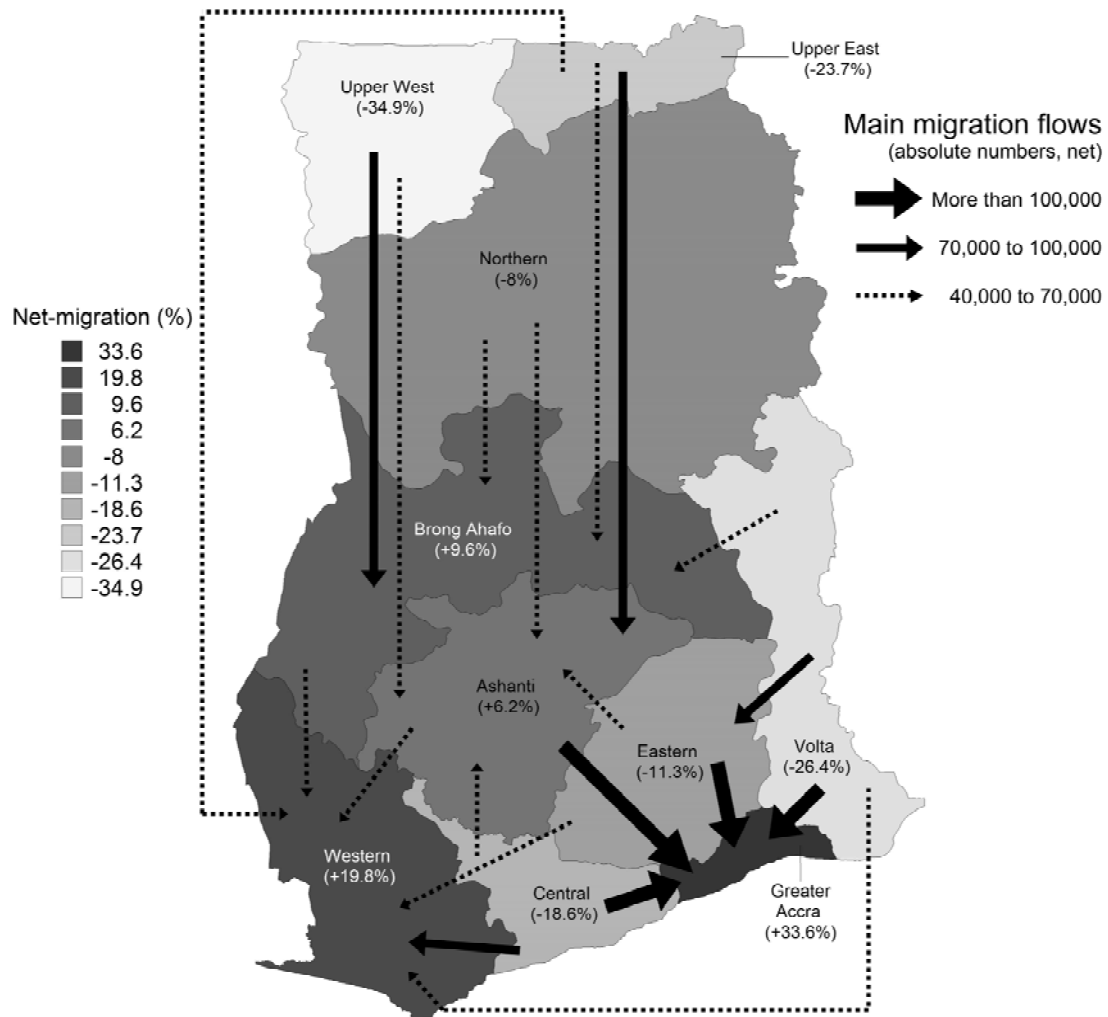
The Dagara people are an ethnic group whose home area is located in Northwest Ghana and Southwest Burkina Faso. Linguistically, the Dagara are part of the Mole-Dagbani group, which also includes the Mossi, Dagomba, Frafra, Mamprusi, Wala and others. The origin of the people who are now called Dagara is subject to considerable debate. The most commonly adhered to thesis nowadays is that the Dagara are descendants of people who moved west from the more centrally organized Dagomba state about five hundred years ago. They settled in empty lands along the Black Volta or absorbed earlier settlers through conquest and inter-marriage. Until the advent of colonial rule, in the first decade of the 20<sup>th</sup> century, the social and political organization of the Dagara was based on lineage groups and earth shrine areas. Each earth shrine area was controlled by an earth priest (*tendaana* or *tengansob*) who was usually a descendant of the first Dagara settler in the area. The earth priest made sacrifices to the land gods and allocated land to new settlers and established

families who wished to expand their farms. Unlike neighbouring groups like the Wala and the Dagomba, the Dagara had no central authority beyond the village level until the British introduced a system of chieftaincy as was common in other parts of Ghana. However, up to date, earth priests maintained their function of custodians of the land.<sup>3</sup> The Dagara are predominantly small-scale farmers who engage in rainfed food crop cultivation and animal husbandry. The most common crops they cultivate are millet, sorghum, maize, rice, groundnuts, beans and yam and the most common animals they raise are poultry, goats, sheep, pigs and cattle. Vegetable production in irrigated dry season gardens is a common source of food and income in parts of Dagara land. Besides farming, the Dagara traditionally engage in a number of other natural resource based activities, like hunting, fishing and gathering, and cottage industries, like weaving, smock making, wood carving and processing (e.g. beer brewing and sheabutter extraction). In the course of the 20<sup>th</sup> century, such traditional non-farm activities have been expanded with a large number of 'modern' income generating activities, like shop keeping, masonry, carpentry, welding, mechanics and catering. In addition, many Dagara are nowadays educated beyond secondary school level and find work as civil servants, for example in teaching, nursing and agricultural extension.

---

<sup>3</sup> See Van der Geest (2004) for a more detailed review of the literature about the social organization and origins of Dagara people. An in-depth study of Dagara history is provided by Lentz (2006).

Figure 3: Inter-regional migration in Ghana



Source: Calculated from Ghana Statistical Service (2005a). Net flows of less than 40,000 people are excluded from the figure. Map by Kees van der Geest.

### 1.2. Dagara Migration

The Dagara migration system is part of a larger pattern of North-South migration in Ghana (see Figure 3). According to the last population census, which was held in the year 2000, about one out of three Dagara people (36 percent) is living in Southern Ghana. More than half of them (51 percent) reside in the Brong Ahafo Region. Within the Brong Ahafo Region, Wenchi District is the most popular destination of Dagara migrants. During the last population census 23,965 Dagara people were counted in Wenchi District, which amounted to 14 percent of the total population. The Ghana Population and Housing Census does not report exact out-migration figures at district level. Therefore, district out-migration rates were estimated based on four variables that are closely related to migration: population growth,

adult sex ratios, the proportion of elderly in the population and urbanization rates.<sup>4</sup> For Lawra District, it was estimated that 36 to 38 percent of the people born in the district were living outside the Upper West Region at the time of the census. Within this group, almost ninety percent migrated to Southern Ghana.

The North-South migration system of the Dagara was initiated by colonial coercion in the first decades of the 20<sup>th</sup> century. In pre-colonial times, before the advent of the modern migration system, Dagara people moved over shorter distances, mainly in search of fertile land and to escape conflict, oppressive rulers and slave raiders. Human mobility in this era has been described as 'a tradition of local migration by many and long-distance migration by a minority of warriors and traders' (Cleveland 1991). In the 18<sup>th</sup> and 19<sup>th</sup> century, voluntary migration over longer distances was impeded by conflict and insecurity resulting from the wars between the Ashanti, the Gonja and the Dagomba and the related activities of slave raiders.

In 1901 the present Northern Ghana was colonized by the British, and in the first decade of the 20<sup>th</sup> century, colonial officers came to the Northwest to recruit labourers for the mines and for road and railway construction in the South. The time of forced labour recruitment lasted about two decades, from 1906 to 1927. The working conditions were poor and mortality in the mines was high, but the first groups of labour migrants returned with possessions and stories that enticed others to embark on trips to Southern Ghana voluntarily. Instead of seeking employment in the mines, many opted for work as labourers in the booming cocoa sector where wages and working conditions were better. Within a few decades of the first recruitment campaigns, labour migration to the South had become a common source of livelihood and a 'rite of passage' for young men in the area (Lentz 2006).

In the past hundred years, out-migration rates have gradually increased with a temporary decline in the 1970-1984 inter-censal period (see table 1). Widespread poverty in Northern Ghana and the prospect of escaping poverty in the more developed southern part of the country are the principal causes of migration from Northern Ghana. Poor agro-ecological conditions, lack of non-farm income opportunities, a long history of governmental neglect and unequal development are some of the root causes of poverty in Northern Ghana.

---

<sup>4</sup> For the estimation procedure, see Van der Geest 2011: 220-222).

Table 1: Trend in North-South migration propensities (1931-2000)

|                               | 1931   | 1948                 | 1960    | 1970    | 1984    | 2000    |
|-------------------------------|--------|----------------------|---------|---------|---------|---------|
| Population N-Ghana (1000)     | 717    | 1,077                | 1,289   | 1,590   | 2,375   | 3,141   |
| People born in N-Ghana (1000) | 759    | 1,150                | 1,215   | 1,708   | -       | 3,673   |
| Population S-Ghana (1000)     | 2,131  | 3,042                | 5,438   | 6,969   | 9,921   | 15,595  |
| North-South Migrants          | 44,013 | 152,960              | 189,160 | 262,296 | 144,588 | 677,069 |
| % pop N-Ghana                 | 6.1    | 14.2                 | 14.7    | 16.5    | 6.1     | 21.6    |
| % born N-Ghana                | 5.8    | 13.3                 | 15.6    | 15.4    | -       | 18.4    |
| % pop S-Ghana                 | 2.1    | 5.0 <sup>&amp;</sup> | 3.5     | 3.8     | 1.5     | 4.7     |

Sources: Census Office Gold Coast (1932: 21); Census Office, Gold Coast (1950: 360, 362-366); Census Office (1962: 13-14); Census Office (1973: 106-110); Ghana Statistical Service (1995: 157); Ghana Statistical Service (2005a: 130-131). Notes: (1) Inter-regional migration figures are published in a census volume called “detailed demographic characteristics”. This volume was not published in 1984 and there is, therefore, no detailed migration data for 1984. The figure for 1984 was calculated from Ghana Statistical Service (1995: 157). According to this report 121,324 people who were born in Northern Ghana and who were older than fifteen resided in Southern Ghana. The total number of North-South migrants in 1984 was estimated by using the proportion of migrants aged > 15 from the 1970 census (83.91 percent):  $100 / 83.91 * 121,324 = 144,588$ . (2) The 1948 census had serious problems. The population was under-estimated for Southern Ghana (Engman 1983). Therefore, the number of migrants from Northern Ghana as percentage of the total population in Southern Ghana was probably lower than 5.0 percent.

Patterns of Dagara migration have changed over time as a response to changes in migrants' opportunity structure in source and destination areas and as a result of a maturing of the migration system. We can discern four major trends. These involve changes in the composition of the migration flow and spatio-temporal and occupational changes. Firstly, the Dagara migration system has matured in the sense that there has been a shift from individual, male-dominated migration to the movement of entire households. It has also become more common for women to migrate independently. Second, migration has become increasingly permanent. The first groups of male migrants moved alone or with friends and worked in the South on short contracts. Although seasonal migration is still common and many long-term migrants still return to the Upper West, more and more migrants nowadays settle in Southern Ghana permanently. This change is related to the shift from individual to household migration. Migrants' children grow up in the South, which makes it more likely for parents to stay. The third trend is occupational. In the early stages of Dagara migration, almost all migrants were employed as mine workers, farmhands, labourers in infrastructural projects or night-soil collectors (toilet cleaners). Nowadays, Dagara migrants increasingly settle in Southern Ghana to establish their own farms; to earn an income through self-employment in the informal economy; or to work in white-collar jobs like teaching and nursing. The most common occupation of Dagara migrants nowadays is farming. Fourthly and closely tied to this occupational shift is a change in destination region. Initially, most Dagara migrated to urban settlements in the Ashanti Region and the Western Region.



Nowadays, rural areas in the Brong Ahafo Region are the prime destinations. In sum, after more than half a century of predominantly individual, male dominated, wage labour migration, the Dagara have increasingly returned to their pre-colonial system of family migration in search of fertile land. The difference is that their action radius has expanded to Southern Ghana.

Below, the major findings on migration, environment and development linkages are summarized.

## 2. Migration and Environment in Ghana

The analysis presented in Van der Geest et al (2010)<sup>5</sup> offers a first exploration of migration-environment linkages in Ghana. This scope in this article is quite broad as it discusses environmental causes as well as consequences of migration, both in source and destination areas. It compares district-level migration rates with vegetation data derived from a satellite that has been measuring the Normalized Difference Vegetation Index (NDVI) since 1981 (see Figure 4). On a two weekly basis this index assesses the presence and density of vegetation around the world. This unique dataset has been used in thousands of scientific articles. However, social scientists interested in deforestation or land degradation hardly make use of it. This article shows that sparsely vegetated districts in Ghana are more likely to have migration deficits (more out-migration than in-migration) and districts with more abundant vegetation are more likely to have a migration surplus. This is an indication that the availability of natural resources is a determinant of migration in Ghana. Whereas many studies and policy documents warn about deforestation and land degradation, the NDVI database shows that vegetation density has increased rather than decreased between 1982 and 2006, especially in Northern Ghana (see Figure 5). Districts with more out-migration than in-migration tend to have more positive vegetation trends than districts that experienced more in-migration. As expected, out-migration seems to relieve pressure on natural resources while in-migration increases it. The national analysis shows that the environment matters in explaining migration flows and that migration matters in explaining changes in vegetation cover. However, the correlations at the national level were quite weak because not all migration flows in Ghana are environmentally induced and because urban-ward migration has little impact on vegetation cover in the destination area. Moreover, these statistics say little about the processes behind migration and vegetation dynamics.

---

<sup>5</sup> Van der Geest, K., A. Vrieling and T. Dietz (2010). Migration and environment in Ghana: a cross-district analysis of human mobility and vegetation dynamics. *Environment and Urbanization*, Vol 22 (1): 107-123. This is Chapter 2 in Van der Geest (2011a).

Figure 4: Average vegetation density expressed in NDVI (1982-2006)

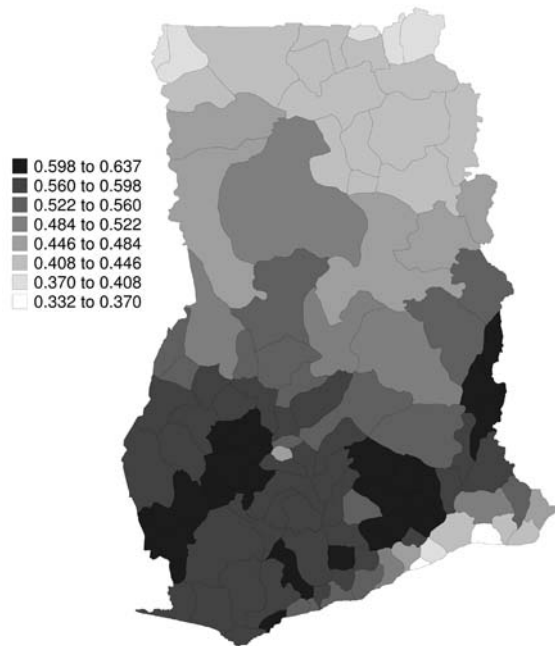
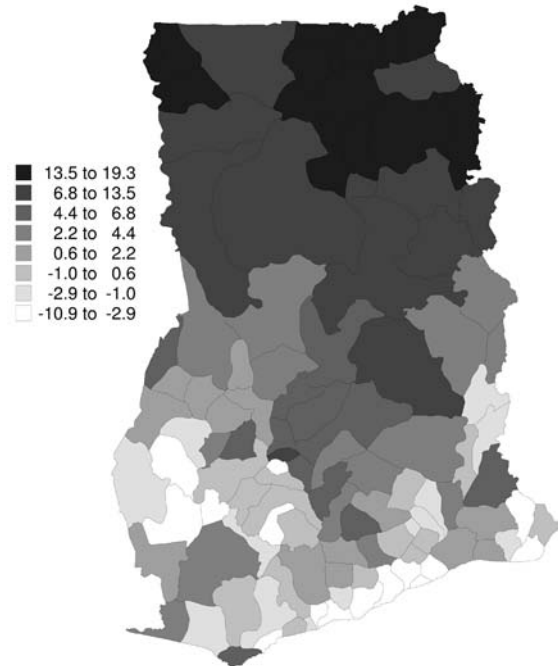


Figure 5: NDVI change (%) (1982-2006)



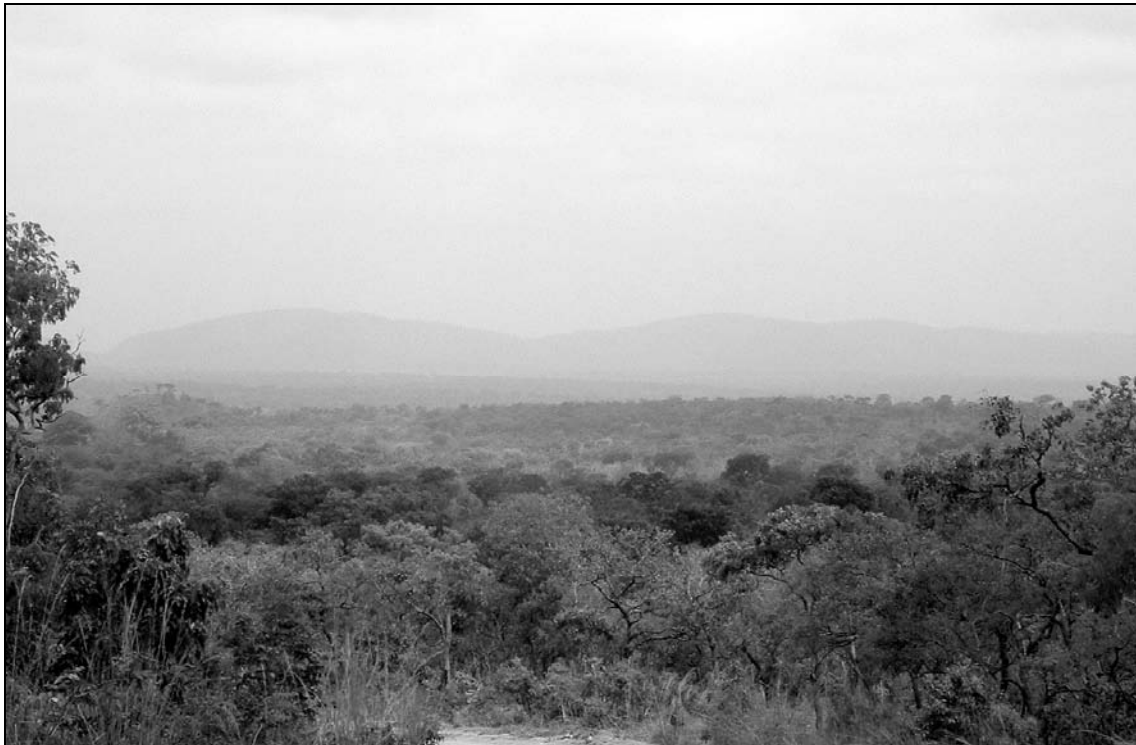
Source: Global Land Cover Facility. Notes: Terrestrial NDVI values range from zero to one. Values close to zero indicate barren land and values approaching one are found in densely vegetated areas such as tropical rainforests. Trends were calculated as the slope multiplied by the number of years and divided by the long-term average. The units of analysis are districts (N=110).

In the second part of this article, in which the focus shifts to three principal domestic migration flows in Ghana, a more insightful interpretation of migration and environment linkages is presented. In the North-South migration system, environmental push plays an important role in explaining migration and the major pull factors are low population density and good conditions for crop cultivation. In the principal destination regions of migrants from the North (Ashanti and Brong Ahafo) no evidence of a negative impact of migration on vegetation cover was found. A possible explanation is that settler farmers from the North predominantly cultivate the fallow land of native people who tend to shift their livelihoods to non-farm occupations. The second migration system we studied is cocoa frontier settlement. Here, the movement is from densely populated areas with a large incidence of mature cocoa plantations to sparsely populated areas, mainly in the Southwest (see Figure 3) with a large stock of uncultivated forest. This movement results in a conversion of tropical forest to cocoa plantations. In the long term it does not produce negative NDVI trends because mature cocoa plantations have closed canopies and are evergreen. However, conversion of tropical forest to cocoa plantations entails important biodiversity losses. In the third migration system we studied – migration to the national capital Accra – environmental factors do not play a major role.

Picture 1: Farmer in Northern Ghana gathering stones to sell to builders. Natural resources scarcity in the North is an important reason to migrate to the South.



Picture 2: Relatively empty lands in the Brong Ahafo Region. Availability of fertile farm land is an important pull factor for Dagara migrants.



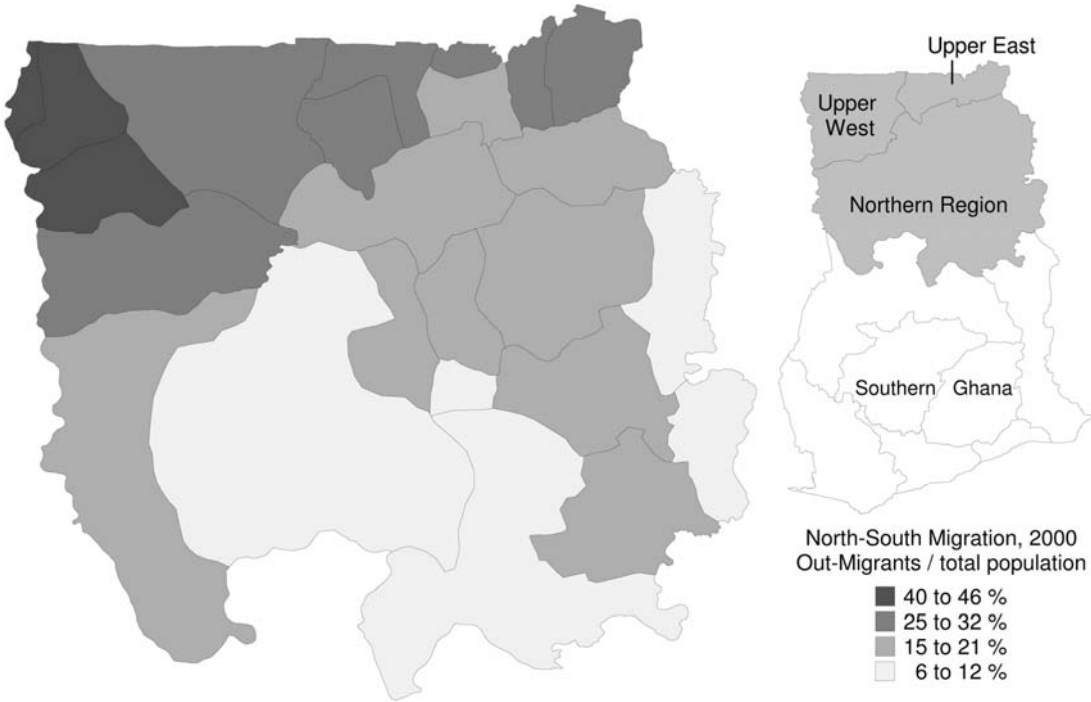
### 3. North-South Migration in Ghana: What Role for the Environment?

Van der Geest (2011b)<sup>6</sup> looks in more detail at the environmental causes of North-South migration, both in source and destination areas of migrants. This chapter contributes to the environmental refugee debate by assessing to what extent North-South migration is environmentally induced and forced. The first part of the chapter contains a cross-sectional and longitudinal analysis of migration propensities and different indicators of natural resources scarcity (rainfall, vegetation, crop yields and population pressure). The second part contains a qualitative analysis of the reasons that Dagara migrants in the Brong Ahafo Region mentioned for their decision to migrate. The two analyses show that environmental push and pull are important causes of migration. Poorly endowed districts in Northern Ghana tend to experience more out-migration than districts with a more benign natural environment (see Figure 6 and 7). However, no evidence was found that North-South migration increased in a period of more pronounced environmental stress (in the 1970s and early 1980s, see Figure 8). Out-migration rates rather declined and many migrants actually returned to the North. In this period in Ghana's migration history, economic crisis and political turmoil played a more decisive role than environmental factors. The survey findings on migration causes showed that scarcity of fertile land in the Upper West Region and the availability of fertile land in the Brong Ahafo Region were the prime reason for Dagara to migrate. Sudden-onset environmental stresses, like drought-triggered famine or floods, were not mentioned. A qualitative analysis of the level of urgency expressed by respondents suggests that a minority were forced to migrate because of acute food security problems in the North. However, for most Dagara in the Brong Ahafo Region migration was part of a larger, proactive household strategy to reduce pressure on land at home and to benefit from better farming opportunities in the forest-savanna transition zone. The analyses at the regional level as well as the local level indicate that structural agro-ecological differences between Northern Ghana and Southern Ghana were a more important migration cause than environmental degradation and disaster.

---

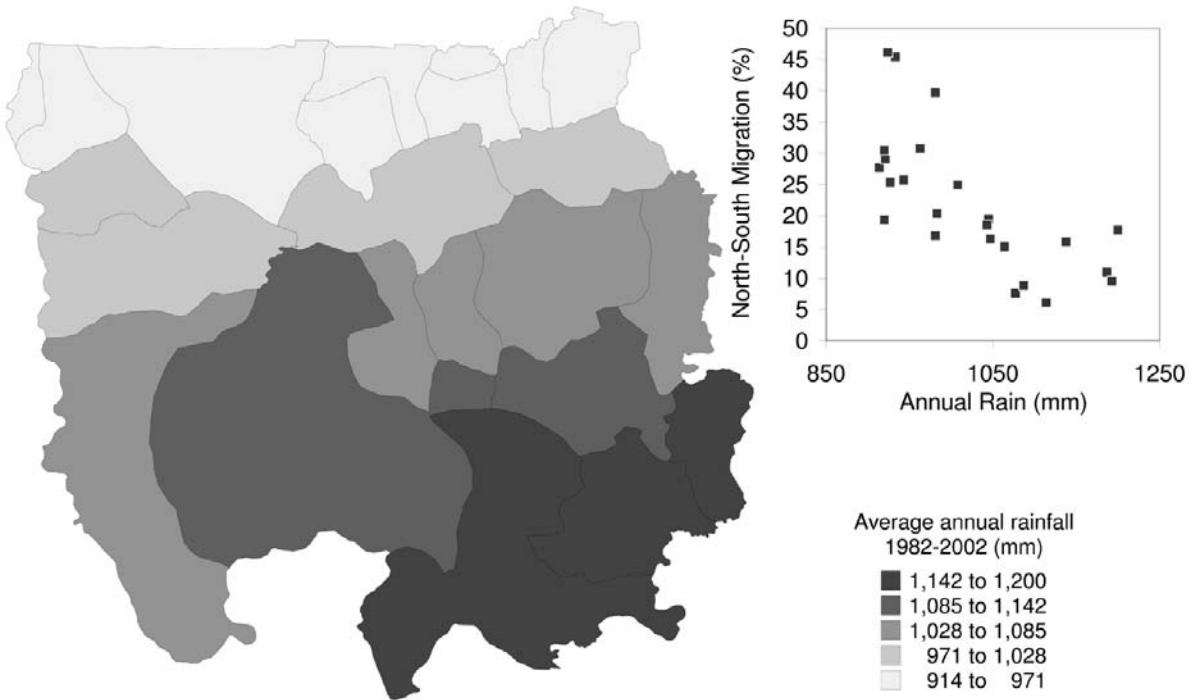
<sup>6</sup> Published as: Van der Geest, K. (2011). North-South migration in Ghana: What role for the environment? *International Migration*, Vol 49 (S1): 69-94. This is Chapter 3 in Van der Geest (2011a)

Figure 6: North-South migration propensities (2000)



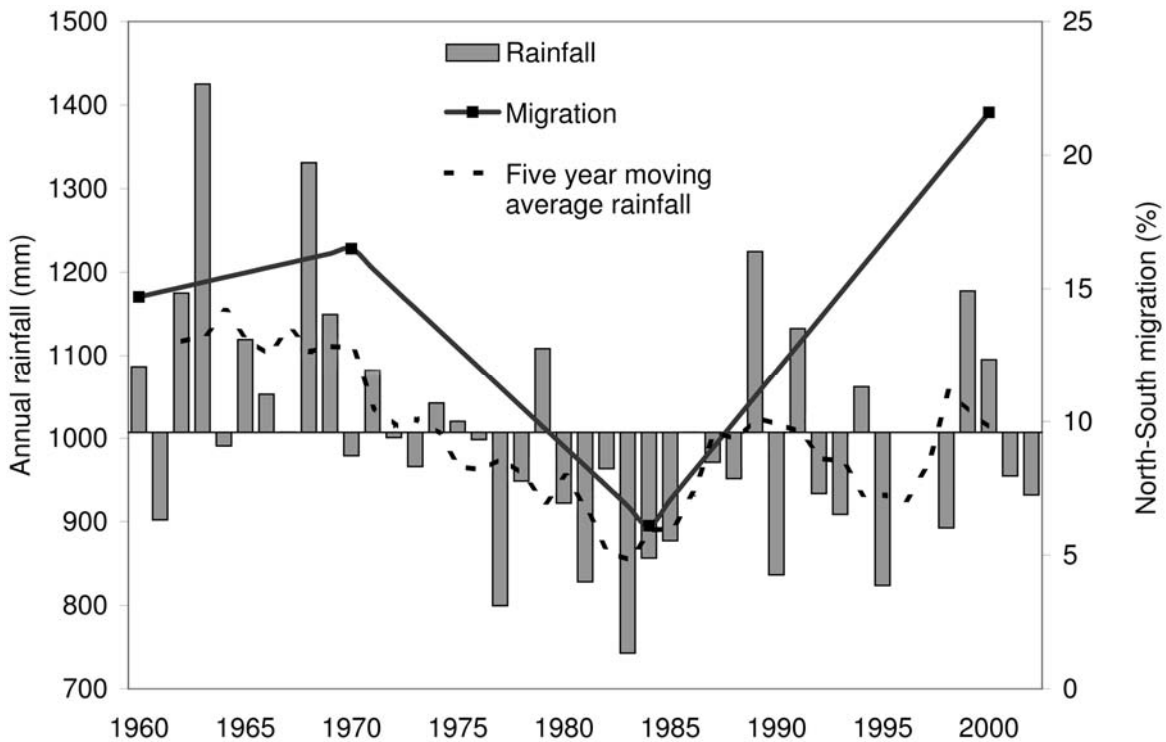
Source: Estimated from Ghana Statistical Service (2005b). Map by Kees van der Geest

Figure 7: Average annual rainfall in Northern Ghana (1982 to 2002)



Source: Calculated from the TS 2.1 dataset of the Climate Research Unit of the University of East Anglia. Notes: In Van der Geest (2011b) similar maps and scatters were drawn for vegetation density, crop yields and population pressure, producing similar results. Map by Kees van der Geest.

Figure 8: Rainfall and migration propensities in Northern Ghana (1960-2000)



Sources: Ghana Meteorological Services Department and Census Reports, see Table 1. The rainfall data are based on twenty rainfall gauges in Northern Ghana. The data for 1996 and 1997 are missing.

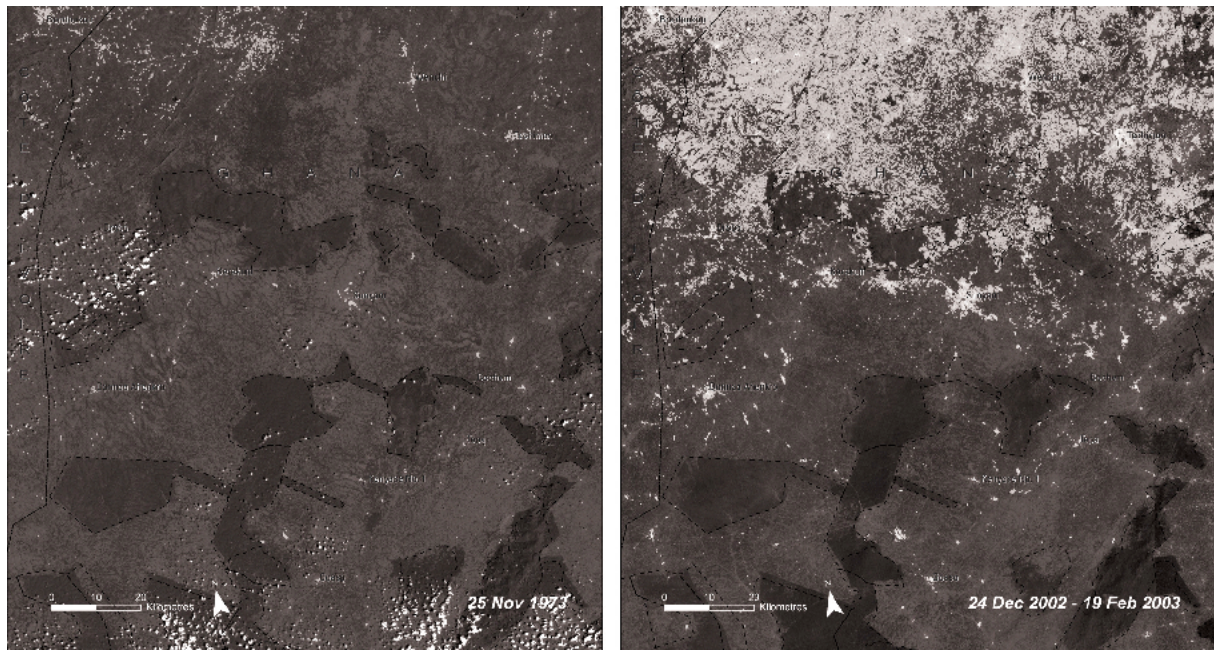
#### 4. Environmental Impact of in-Migration in the estination Area

In Van der Geest (2010a)<sup>7</sup>, the environmental impact of Dagara migration in a prime destination area is investigated. Satellite images from 1973 and 2003, published by the United Nations Environmental Program (UNEP), suggest that the Northwest of the Brong Ahafo Region has experienced widespread land degradation over the past decades (see Figure 9). According to UNEP, land degradation in Ghana is primarily caused by unsustainable farm practices. In addition, several studies comparing the land use of settlers and native farmers conclude that migrants' farming methods are particularly detrimental to the environment. This chapter uses a variety of data to challenge the 'easy conclusion' that Dagara migration to the Brong Ahafo Region has been an important cause of land degradation in the destination area. First, the validity of UNEP's degradation narrative is challenged by looking at the timing of the LANDSAT images and the seasonality of vegetation cover in the area (see Figure 10). The image of 1973 was taken at the end of the rainy season while the image of 2003 was taken at the height of the dry season. Second, remotely sensed vegetation data and historic census data are used to show that most degradation, *if at all*, must have occurred before the area became a major destination of Dagara migrants. Over the past two decades, the vegetation trend has been positive (see Figure 10). The droughts of the 1970s and early 1980s and related wild fires appear a more likely explanation for land cover change.

---

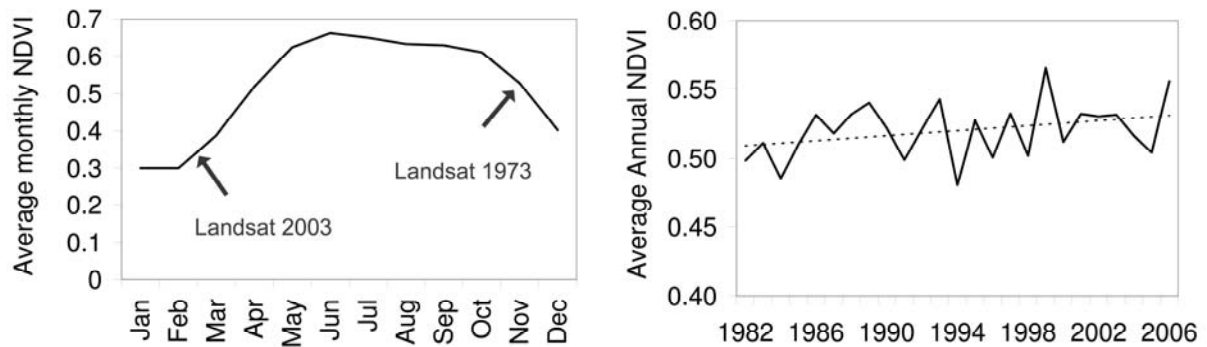
<sup>7</sup> Published as: Van der Geest, K. (2010). Migration agricole et usages durables de la terre dans la zone de transition forêt-savane au Ghana. *Hommes et Migrations*. No. 1284 (mars-avril 2010). This is Chapter 4 in Van der Geest (2011a).

Figure 9: Alleged land degradation in the Brong Ahafo Region (LANDSAT, 1973 – 2003)



Source: UNEP (2008: 185). Note: the original publication shows the images in ‘true colour’. The dark patches are forest reserves. Lighter shades of grey indicate less green cover. The white dots in the South and Midwest of the first image are clouds.

Figure 10: Average monthly NDVI and NDVI trend in Wenchi District (1982-2006)



Source: Global Land Cover Facility. Note: In the NDVI scale, a value of zero indicates bare soil and a value of one indicates dense forest.

Third, it is argued that earlier studies comparing settlers’ and natives’ farming methods used problematic assumptions of environmental sustainability. Fourth, in focus group discussions about (causes of) environmental change in the area, the arrival of migrants from the North appeared to play a minor role. Lastly, survey data on farming methods of Dagara settlers and native farmers are analysed with assumptions that are based on a land use and land cover study that compared the environmental outcomes of different farming styles. The findings show that there are appreciable differences in farming methods between settlers and native farmers, but no evidence is found that settlers’ farm practices are less sustainable.



## 5. Local Perceptions of the Consequences of out-Migration

Chapter five, six and seven of Van der Geest (2011a) focus on the consequences of out-migration in the area of origin. In Chapter five<sup>8</sup>, local *perceptions* of migration from the Nandom Area in Northwest Ghana are studied. A qualitative analysis of 204 respondents' answers to open question about the impact of seasonal migration, long-term migration and return migration yields a holistic view of the matter, encompassing consequences in many different realms of life (e.g. food security, income, health, education, agriculture, social cohesion, communal labour, funerals, architecture and knowledge). Respondents were very positive about the contribution of seasonal migration to food and livelihood security, but they were critical about the consequences of long-term migration and return migration. Respondents who held a negative opinion about long-term migration usually lamented the lack of support (remittances) from migrant relatives. A positive effect of out-migration, highlighted by almost half the respondents was that it reduces the pressure on farmland. With a population density of about one hundred inhabitants per square kilometre, land is relatively scarce in the Nandom Area. Fallow periods are short and agricultural productivity is low. A common perception is that without migration, there would not be enough land to sustain the population, which would result in more hunger, poverty and conflict.

## 6. The Malthus-Boserup Curve and Migration from Northwest Ghana

Chapter six<sup>9</sup> looks at the relation between migration, population density and agricultural productivity in the twenty-four districts of Northern Ghana. In the theoretical part of this chapter it is argued that the migration and agricultural development debate can benefit from cross-fertilization with the Malthus-Boserup debate about population growth and land use intensity. The central thesis of this chapter is that one has to know where a region is situated in the transition to more intensive land use to understand the impact of out-migration on agricultural development. Whereas agronomists have since long recognized population density as a major determinant of farming systems in Africa, studies about the impact of migration on agricultural development, which are typically carried out by migration scholars, have ignored the indirect effect of out-migration that runs through population density. An important finding of this chapter is that by recognizing the intervening role of population density, the reverse causality problem in studies about the impact of migration on agricultural

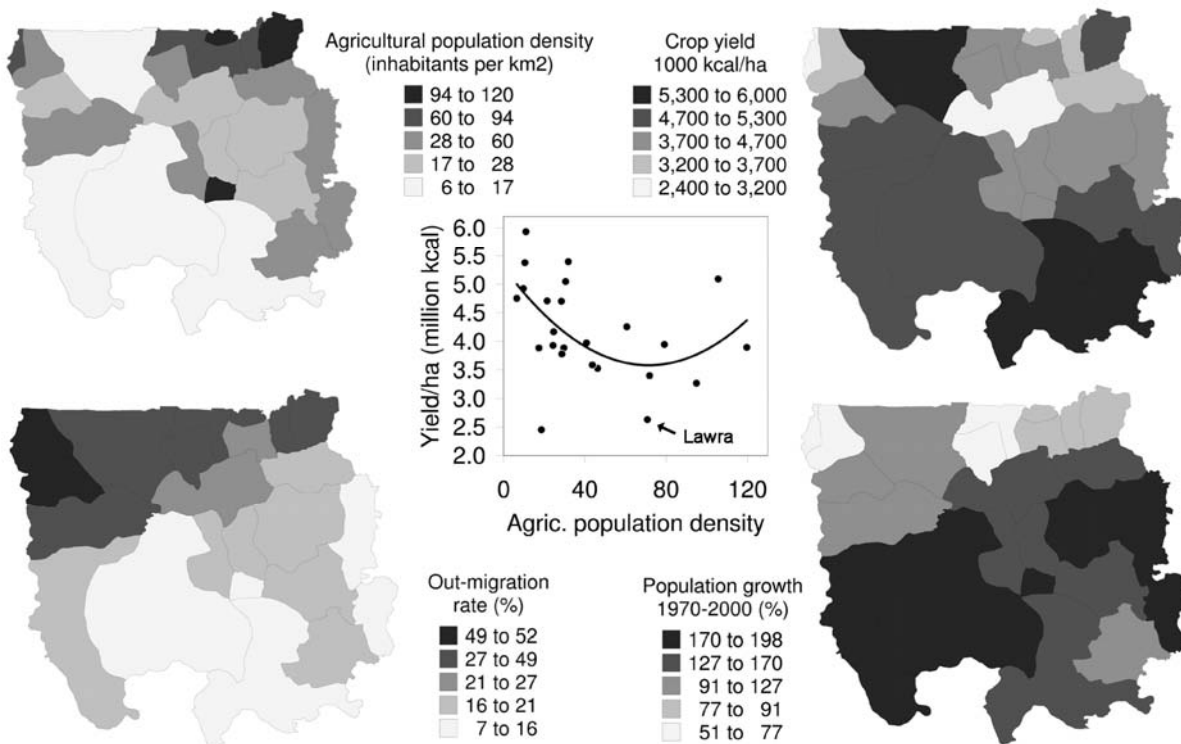
---

<sup>8</sup> Published as: Van der Geest, K. (2010). Local Perceptions of Migration from Northwest Ghana. *Africa*, Vol 80 (4): 595-619. This is Chapter 5 in Van der Geest (2011a).

<sup>9</sup> Submitted for publication. Please refer to PhD dissertation, published by the African Studies Centre. Van der Geest, K. (2011). The Dagara farmer at home and away: Migration, environment and development in Ghana. *African Studies Collection* no. 33. Leiden: African Studies Centre.

development can be addressed. The empirical part of this chapter shows that there is a U-shaped curve between population density and crop yields (see Figure 11). Up to about one hundred inhabitants per square kilometre, the relation between population density and crop yields is negative (as predicted by Malthus). Beyond this population threshold, crop yields increase, presumably because of a transition to more intensive land use (as predicted by Boserup). For the twenty districts in the first half of the Malthus-Boserup curve, the cross-district analysis indicates that low crop yields are a cause rather than a consequence of out-migration. It further shows that out-migration has a positive effect on farm sizes and agricultural output per capita.

Figure 11: Population density and growth, crop yields and out-migration in Northern Ghana



Sources: Ghana Statistical Services (2005b); Central Bureau of Statistics (1984); Ministry of Food and Agriculture.

Compared to other districts in Northern Ghana, Lawra District – in which the Nandom area lies – has medium to high population density and is situated right at the bottom of the Malthus-Boserup curve (very low crop yields, see Figure 11). A transition to more intensive land use is required to increase agricultural productivity. While respondents in the Nandom Area emphasized that out-migration relieves pressure on farmland, a negative effect is that it removes the incentives for a transition to more intensive land use. Migration and agricultural productivity data at district level suggest that large-scale migration has allowed the farming

system to stand still or at least evolve very little. Chapter seven of *'The Dagara farmer at home and away'* (Van der Geest 2011a) investigates whether this is indeed the case.

## 7. Migration and Agricultural Development in Nandom, Northwest Ghana

In this chapter<sup>10</sup>, demographic and farm characteristics of 204 rural household in the Nandom Area are used in a more in-depth analysis of migration and agricultural development at local level. The effects of seasonal migration, long-term migration and return migration are studied separately. The survey findings confirm that migration propensities in Nandom are high and agricultural productivity low. However, the findings also show that farmers in the area are adopting a number of measures that aim to increase agricultural productivity and protect the fertility of the land. Examples are animal traction (see Picture 4), improved seed varieties, composting, physical soil and water conservation measures and zero burning. These measures involve a higher input of labour and capital per unit of land. Another way to increase production is to expand farm sizes. The adoption of different farming methods varies per household. This chapter assesses to what extent migration influences agricultural land use. Three broad avenues of migration impact on agriculture are investigated. First, the effect of migration on household composition, farm size and the adoption of labour-led intensification measures; second, the impact of migrant savings and remittances on capital-led intensification measures; and third, the impact of return migration. The findings suggest that migration characteristics at the household level are not major determinants of farm practices. No negative effect of loss of labour on adoption of labour-led intensification measures is found. The impact of migration on farm size depends on *who* migrates. The migration of a brother – with whom the respondent might have to share land – tends to have a positive impact on farm size. The migration of a son – who is likely to contribute labour to the household farm – tends to have a negative impact on farm size. The potentially positive effect of migrant savings and remittances on capital-led intensification is limited because the volume of remittances is quite low; because remittances are primarily used for survival purposes; and because the policy environment and market conditions do not favour investment in agriculture. The potentially positive effect of return migration does not materialize because most returnees do not acquire the kind of skills and assets that would enable them to become agents of change.

In the past few years – after the survey was conducted – food prices increased sharply and a number of international NGOs started projects to support farmers in the area. Further,

---

<sup>10</sup> Not yet submitted for publication. Please refer to PhD dissertation, published by the African Studies Centre. Van der Geest, K. (2011). *The Dagara farmer at home and away: Migration, environment and development in Ghana. African Studies Collection* no. 33. Leiden: African Studies Centre.

it is expected that Nandom will be connected by a tarred road to the regional capital and Southern Ghana within a few years. If these improvements in the conditions for investment in agriculture are sustained, it is more likely that migration will start to contribute positively to agricultural development. The relation between migration and development is mediated not only by population density, but also by policy and market conditions.

Picture 3: Most farming in Nandom is done by hand and with few external inputs



Picture 4: An important change in the farming system is the use of animal traction



#### 8. The environmental impact of out-migration in the source area

The environmental impact of out-migration in migrants' source areas has received very little attention in academia so far. In *'The Dagara farmer at home and away'* (Van der Geest 2011a) no separate chapter has been dedicated to this topic, but several chapters contain information that shed light on the impact of out-migration on availability, trends and management of natural resources. The theoretical framework and research design used to assess the environmental impact of out-migration in Northwest Ghana borrows insights from adjacent fields, such as the migration and development debate and the broader population-environment debate. Theoretically, two types of impact can be distinguished. First, out-migration can have an environmental impact through its effect on population size. When population growth is associated with environmental degradation, the effect of out-migration is likely to be positive. Second, the impact can be mediated by the effect of out-migration on population composition, livelihood choices, productive technologies, living standards and consumption patterns. In this research, the environmental impact of out-migration was studied at two levels. For Northern Ghana, population census data from twenty-four districts were related to a remotely sensed vegetation index. This more 'distant' analysis looked at environmental outcomes rather than mechanisms. In a local case study of Nandom in

Northwest Ghana, household questionnaire data about migration propensities and environmental management were analysed.

Between 1982 and 2006 a significant positive trend in vegetation cover is discernible throughout Northern Ghana (see also Figure 5). Over this period, the Normalized Difference Vegetation Index (NDVI) for Northern Ghana as a whole has increased with 12.1 percent. The vegetation trend for Southern Ghana is much less positive and uniform. The time series of remotely sensed vegetation data only starts in the early 1980s so it is difficult to judge what exactly the long-term trend looks like. The 'greening of Northern Ghana' probably results to a large extent from ecosystem recovery after the great Sahelian droughts of the 1970s and early 1980s, but human factors may also play an important role. Within Northern Ghana densely populated areas tend to have less green cover than sparsely populated areas, but the vegetation trend was most positive in densely populated areas. This could be an indication that population growth beyond a certain threshold is not only associated with increasing crop yields (as explained in section 6), but also with environmental recovery. A strong positive association was also found between out-migration and vegetation cover. Districts that experienced more out-migration had significantly more positive trends in vegetation cover. This would rather sustain the notion that out-migration has a positive effect on the environment simply by reducing population pressure on natural resources.

A more thorough spatial analysis of a wider array of potential drivers – both natural and human – of vegetation change in Northern Ghana is needed to adequately assess the interplay of different factors that have contributed to the greening of Northern Ghana over the past quarter century. This could yield insightful information about the relative importance of out-migration as a driver of environmental recovery, and more importantly, it could reveal under which circumstances out-migration has a positive effect on green cover. Such an analysis would need close collaboration between social scientists, ecologists and remote sensing specialists. Within a few years, when the results of the next population census are published, and when the NDVI database is updated, more cogent statements can probably be made about the importance of human vis-à-vis natural causes.

Besides its effect on population size, out-migration can also influence green cover and other measures of environmental quality through migration-induced changes in livelihood systems and environmental management. Examples of negative effects would be loss of labour needed for environmentally sustainable farm practices and investment of remittances in unsustainable farm practices. Positive effects of migration on environmental management could be investment of remittances in sustainable farm practices. Also, migrants may acquire knowledge and skills about improved management that they could apply upon return. The household data on migration propensities and land use, summarized in section 7, provide no

clear evidence for such effects – positive or negative – in the Nandom Area. Moreover, in the analysis of migration perceptions, summarized in section 5, a wide variety of migration consequences was recorded, but none of the two hundred respondents mentioned an impact of migration on environmental management.

Within the broader field of migration-environment studies, the analysis of environmental consequences of out-migration in migrant source areas remains virgin ground. An important insight from the present research is that this complex issue needs to be studied at different levels of scale and that the impact of out-migration on environmental quality depends on an area's position on the 'Malthus-Boserup curve'. In Northern Ghana, districts with more out-migration tend to have more positive vegetation trends, presumably because out-migration reduces population pressure on natural resources. At the same, it was found that out-migration – by reducing pressure on natural resources – can make the need for a transition to more sustainable land use look less urgent and thereby thwart a transition to more sustainable land use. In the Nandom Area of Northwest Ghana, the farming system and natural resources management in general would have been very different today in the absence of out-migration and with much higher population densities. High pressure on farmland and other natural resources could have resulted in more food insecurity and environmental crisis as predicted by Malthusian theory, but the situation in more densely populated districts in Northern Ghana suggests that a Boserupian transition to more sustainable land use would have been more likely.

## 9. Conclusion

In this section an attempt is made to go beyond the specific chapter topics and present overall findings on migration, environment and development linkages in the Dagara migration system. The general conclusion of this research with regard to environmental causes of Dagara migration is that structural differences in agro-ecological conditions – rather than degradation and disaster – play an important role and that environmental factors act in complex interplay with economic, political, social and cultural factors. The conclusion about the environmental impact of Dagara migration in destination areas in the Brong Ahafo Region is that earlier studies on this topic overrate environmental degradation and wrongly identify migrants as the culprits. With regard to the impact of migration on development in migrant source areas the conclusion is that migration contributes to food security and livelihood security in the short term. However, in the long run it has the potential to remove the incentives for a transition to more sustainable land use and livelihoods. The environmental impact of out-migration in migrant source areas proved hard to assess and requires further research. A strong association was found between out-migration rates and environmental

recovery at district level in Northern Ghana. However, it is not clear what role out-migration exactly played in the greening of Northern Ghana.

## References

- CENSUS OFFICE, GOLD COAST (1932), *Appendices containing comparative returns and general statistics of the 1931 Census*. Accra: Census Office.
- CENSUS OFFICE, GOLD COAST (1950), *The Gold Coast: census of population 1948: Report and tables*. London: The Crown Agents for the Colonies.
- CENSUS OFFICE (1962), *1960 population census of Ghana. Advance report, volumes III and IV*. Accra: Census Office.
- CENSUS OFFICE (1973), *1970 population census of Ghana, volume III: Detailed demographic characteristics*. Accra: Census Office.
- CENTRAL BUREAU OF STATISTICS (1984), *Preliminary Report of the 1984 Population Census of Ghana*. Accra: Central Bureau of Statistics.
- CLEVELAND, D.A. (1991), Migration in West Africa: A savanna village perspective. *Africa* 61 (2): 222-246.
- ENGMAN, E.V.T. (1983), *Population of Ghana, 1850-1960*. Accra: Census Office.
- GHANA STATISTICAL SERVICE (1995), *Migration research study. Vol 1: Internal migration*. Accra: Ghana Statistical Service.
- GHANA STATISTICAL SERVICE (2005a), *2000 Population & housing census. Population data analysis reports. Vol 1: Socioeconomic and demographic trends analysis*. Accra: Ghana Statistical Service.
- GHANA STATISTICAL SERVICE (2005b), *2000 Population & housing census. Analysis of district data and implications for planning*. Accra: Ghana Statistical Service.
- LENTZ, C. (2006), *Ethnicity and the making of history in Northern Ghana*. Edinburgh: University Press.
- UNEP (2008), *Africa: Atlas of our changing environment*. Nairobi: UNEP.
- VAN DER GEEST, K. (2004), "We are managing!" *Climate change and livelihood vulnerability in Northwest Ghana*. Leiden: African Studies Centre, ASC Research Reports 74.
- VAN DER GEEST, K. (2010b), Migration agricole et usages durables de la terre dans la zone de transition forêt-savane au Ghana. *Hommes et Migrations* 1284 (mars-avril): 112-127.
- VAN DER GEEST, K. (2010a), Local perceptions of migration from Northwest Ghana. *Africa* 80 (4): 595-619.
- VAN DER GEEST, K. (2011a). The Dagara farmer at home and away: Migration, environment and development in Ghana. *African Studies Collection* 33. Leiden: African Studies Centre.
- VAN DER GEEST, K. (2011b). North-South migration in Ghana: What role for the environment? *International Migration* 49 (S1): e69-e94.
- VAN DER GEEST, K., A. VRIELING & T. DIETZ (2010), Migration and environment in Ghana: a cross-district analysis of human mobility and vegetation dynamics. *Environment and Urbanization* 22 (1): 107-123.



INTERNATIONAL CONFERENCE

Rethinking Migration: Climate, Resource Conflicts and Migration in Europe, 13 -14 Oct. 2011  
[www.network-migration.org](http://www.network-migration.org) and [www.geographie.uni-bremen.de](http://www.geographie.uni-bremen.de)