



Working paper: background conditions

in

Upper East region, Northern Ghana, 2005

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Although the system of agriculture is "fixed"... it leaves much to be desired. Farming methods have not been adjusted to keep pace with the growth in intensity of conditions. Farming is regarded as a custom and not as a business, with the result that in crop production and in animal husbandry the maximum is left to nature.

Lynn 1937:10

1. Introduction

Northern Ghana consists of three regions, Upper East, Upper West and Northern Region, all of which originally comprised the former Northern Territories. Tamale was the administrative centre for this area and many institutions covering Northern Ghana are based here. IFAD has projects in each of the three regions, LACOSREP for Upper East, UWADEP for upper West and NORPREP for Northern Region. By many indicators these three regions are the poorest in Ghana and indeed comparable in poverty to some of the poorest countries in the world, notably Burkina Faso and Mali, by the reckoning of the UNDP. Given the importance of trying to determine the impact on particular development interventions, a working knowledge of the demographic, economic and biophysical background is essential to and evaluation of particular strategies. This working paper describes the current situation in Upper East Region¹.

2. Upper East Region

The UER is located in the extreme northeast of Ghana, bordering Togo and Burkina Faso. It is divided into six districts as follows;

Table 1. UER population and density by district, 2000

District	Population	Land area, km ²	Persons/km ²
Bawku East	307917	2,067	149.0
Bawku West	80606	1,070	75.3
Bolga	228815	1,620	141.2
Bongo	77885	460	169.5
Kasena Nankana	149491	1,951	76.6
Builsa	75375	1674	45.0
Total	920089	8,842	104.1

Source: GSS (2002)

Although not approaching the high-density zones in the humid forest, this is strikingly high for a savannah region with erratic rainfall (cf. §4). The physical geography of the Region is marked by the line of the Gambaga escarpment, running West-East along its southern edge and marking a division with lower density higher-rainfall terrain, which is largely part of Northern region. Table 2 shows the main features of the physical geography of Upper East Region;

¹ The material in this working paper is drawn from two main sources; documents and discussions held in May-June 2005 with staff of the LACOSREP II Project in Bolgatanga and a survey conducted in 1997-8 under the auspices of the Overseas Development Institute but funded by the Department for International Development of the United Kingdom. I would like to thank the staff of LACOSREP and MOFA for their assistance in compiling a wide range of scattered data and in particular, the Project Manager, Roy Ayariga, for long hours out of office seeking elusive reports. The data from 1997-8 was published in abbreviated form in Blench (1997b) but is available in a more complete version in Blench ms.

Features	Type	Amount	
Relief	Flat and gentle sloping areas	1-5%	
	Inselberg outcrops	10%	
	Uplands:	Kugi (406m)	
		Bongo (365m)	
		Tongo (363m)	
		Datoka (353m)	
Drainage systems	Chana (400m)		
	Scarps	200-565m	
	Red & White Volta to the East Sissili & Kulpawm to the West		

Source: Ministry of Food and Agriculture (MOFA)

Upper East Region is the poorest region of Ghana and has been a long-term recipient of food-aid. It has been the location of numerous development projects and is presently the site of considerable NGO activity.

3. Environmental background and ecology

The environmental situation in Upper East Region is poorly described and much of the literature is out of date and repeats previous documents. Sakaa (1998) represents a summary of current material, but it should be emphasised that much has changed since the literature it synthesises.

3.1 Vegetation

Upper East Region is a relatively low rainfall semi-arid savannah, divided into Guinea savannah along its southern limits, grading into Sudan savanna above the escarpment. The dominant tree species are locust ('dawadawa') (*Parkia biglobosa*), shea (*Vitellaria paradoxa*) and kapok (*Ceiba pentandra*) with a ground cover of perennial grasses such as *Andropogon gayanus*. Further north, baobab (*Adansonia digitata*) and whitethorn (*Faidherbia albida*) predominate.

However, much of the land area is an extreme anthropogenic landscape. The natural tree fauna has been severely depleted; in much of the UER almost every species except *Parkia* and *Vitellaria* has been systematically eliminated from the farming areas (Hunter 1967b; see also Kessler 1992 for a description of a similar pattern in neighbouring Burkina Faso). Introduced mango trees are common in bush areas, as is the neem, which has assumed weed species. The bush fires that are set every year reduce all the large trees so that even in remote areas, the vegetation may consist of young trees. The practice of conserving sacred forests close to settlements has conserved a tiny proportion of the original biodiversity. Up-to-date figures for vegetation are not available but Table 3 shows the estimates compiled by the original FAO/IFAD identification mission in 1989.

Table 3. Vegetation and land use in Upper East

Category of Use	1978 Satellite Imagery Estimate (‘000 ha)	1989 Preparatory Mission Estimate (‘000 ha)	Derived Mean (‘000 ha)	(%)
Tree Savanna	134	134	134 to 153	15.2 to 17.3
Shrub Savanna	222	222	222	25.1
Grass Savanna	26	26	26	2.9
Fallow	206	128	167	18.9
Cultivated	223	300	261.5	29.6
Plantations	5	5	5	0.6
Wet Bottomland	51	51	51	5.8
Other	18	18	18	2.0
Total	884	884	884	100.1

Source: IFAD (1989)

Some efforts to counter the absence of trees have been made by the Forestry Department, through local plantations of teak, neem and cassia. In recent years, cashew has been heavily promoted a soil improver. There are also Forest Reserves (Table 4);

Table 4. Forest reserves in UER

Forest District	Administrative	No. of reserves	Km ²
Navrongo	Kasena Nankana & Builsa	17	72.5
Bawku	Bawku East and West	8	29.2
Bolgatanga	Bolgatnaga and Bongo	3	45.5

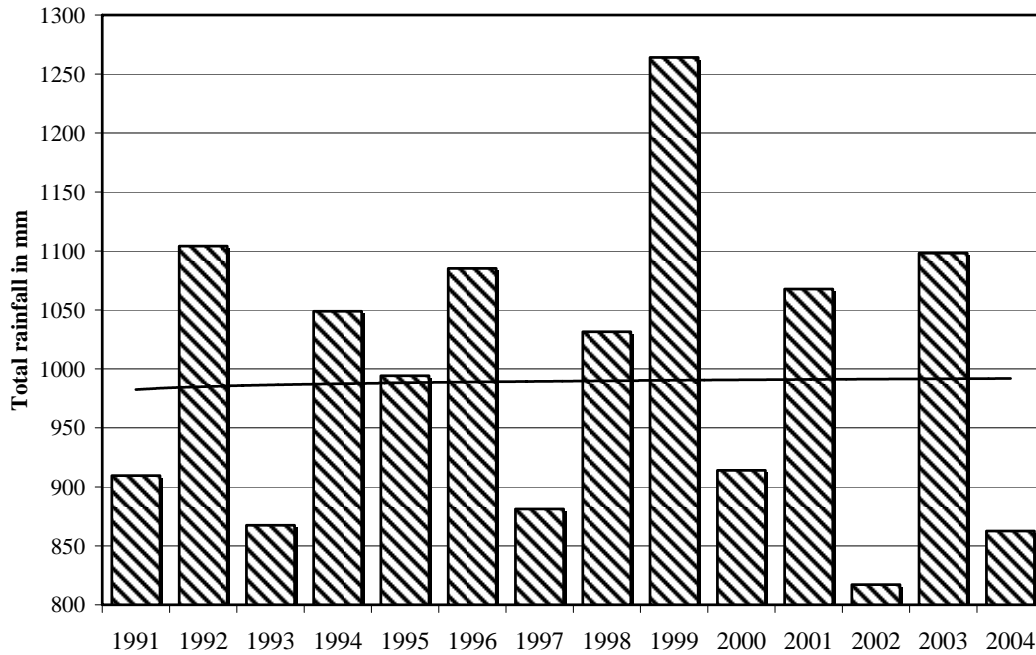
Source: Sakaa (1998:7)

Forest reserves are under pressure from adjacent populations who are desperate for the firewood they represent. In recent years they have been putting pressure on the District Assemblies to open them to their ‘owners’.

3.2 Rainfall and climate

The climatic regime of UER is semi-arid with annual rainfall some 700-1200 mm. Webber (1996a) describing the extreme north-east, quotes the mean for 1955-1992 as 956 mm with a range of 682-1310 mm. The rain falls in a six-month season from April to September. Rainfall can be very patchily distributed and farmers often plant seeds two or three times before the rains set in reliably. It is widely believed throughout the region, by administrators as much as farmers, that the overall quantity of rain falling is declining and that the distribution is more unfavourable than before. Analysis of rainfall data from six stations since 1991 does not suggest this is true. Figure 1 shows the mean annual rainfall, 1991-2004. The chart emphasises inter-annual variability, but the trend is virtually flat, or, if anything, slightly increasing.

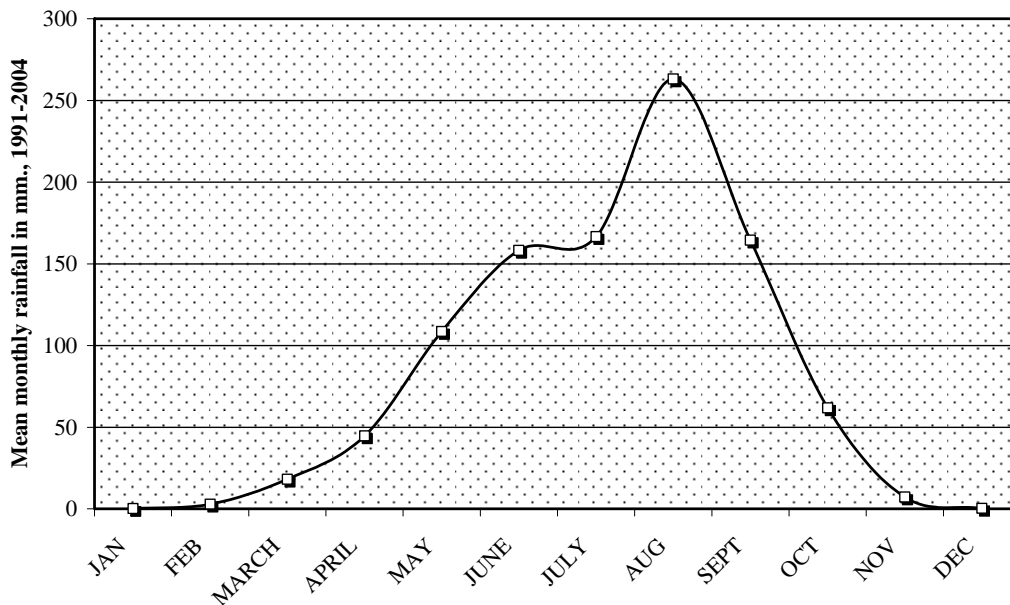
Figure 1. Total annual rainfall in UER, 1991-2004



Similar patterns emerge from longer time-series data and for the two other northern regions of Ghana. Why should the claim about the declining total rainfall be so widely believed? It is likely, in the absence of precise measurements, that farmers judge rainfall by indirect indicators such as vegetation and crop yields. There is no doubt that vegetation is sparser and species adapted to more arid regions are gradually pushing down into this area while at the same time crop yields are falling. These indirect indicators probably do suggest that the aggregate rainfall is less than before; but empirically this is not the case.

What of the other claim that the distribution is more unreliable than before? Farmers typically claim there is a long gap between the first rain and the establishment of the rains, causing early plantings to die off. This is more difficult to check, but superimposition of intra-annual patterns over the last fifteen years do not suggest any systematic pattern of change in distribution. Figure 2 shows the mean monthly rainfall in mm. for Upper East for 1991-2004. There is nothing very exceptional about this for this latitude in West Africa.

Figure 2. Mean monthly rainfall in mm. for Upper East, 1991-2004



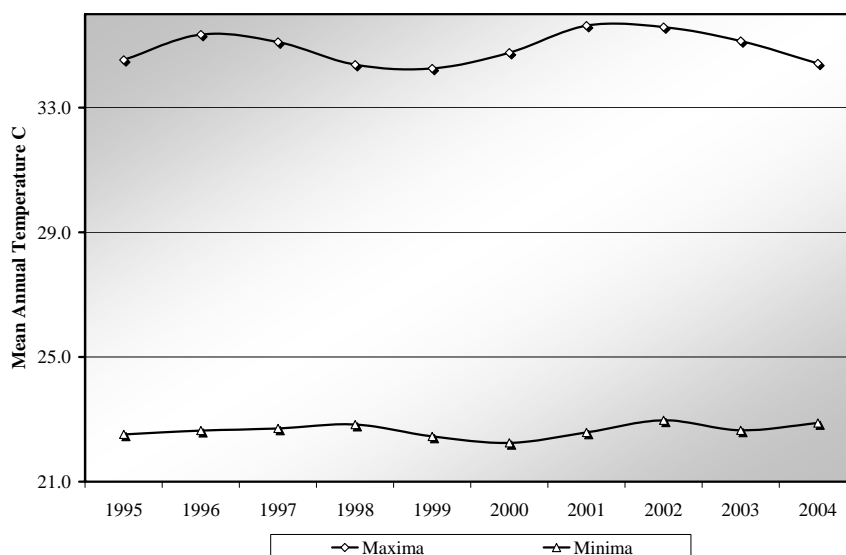
Temperatures

Another hypothesis regularly advanced to account for declining crop yields is a rise in temperature. If temperature were indeed rising, evapotranspiration would cause less of the rain to be available for plant growth. Table 5 shows the main measures of temperature in UER;

Measure	°C
Monthly mean minimum	25
Monthly mean maximum	32
Daily mean	28.5
November to March night minimum	15
November to March night maximum	45

To test the hypothesis that temperatures have increased over this period, maxima and minima were plotted over the period 1995-2004. These are shown in Figure 3;

Figure 3. Temperature maxima and minima in UER, 1995-2004



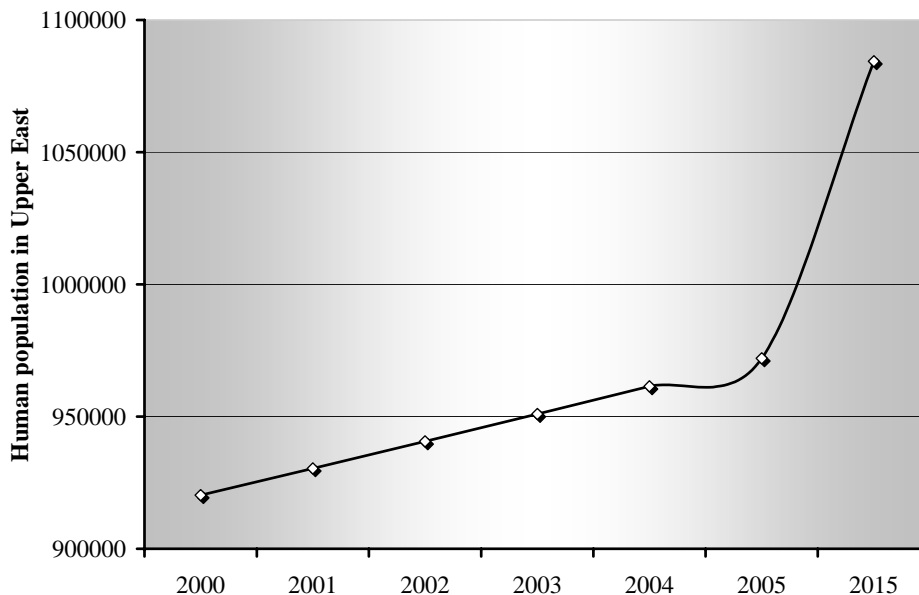
As with rainfall, there is no significant change over this period and indeed, considerably less variability. The hypothesis that climate change is affecting agricultural production in Upper East Region should be provisionally discarded.

4. Demography and human population

4.1 Demography

Upper East Region has some of the highest rural population densities of any region of Ghana and Bongo district in particular is extremely high (Table 1). The most recent census of human population in Ghana was in 2000 (GSS 2002) which gave an overall population for UER of 920,289. Comparing these figures with previous censuses in 1970 and 1984 gives an annual growth rate of 1.1%. Projecting forward the 2000 figures to 2005 gives a human population of 972,031 rising to 1,084,405 in 2015. Figure 4 gives a schematic sense of this type of increase. Although this rate is not as high as some regions in the humid zone, for a stressed population such as this they represent a greater problem in terms of resource use.

Figure 4. Human population trends in UER



Settlement pattern is dispersed nucleated compounds making delivery of centralised services problematic. This pattern was historically a source of concern to agriculture and forest officers. Vigne (1935) observed;

The very densely inhabited areas of the Bawku, Zuarungu, Navrongo districts point to a warning as the result of uncontrolled development. The population of the northern Territories is increasing very rapidly and steps should be taken to prevent a repetition of this wholesale deforestation.

Needless to say, urbanisation levels are very low, and social structures are very fragmented as a consequence of labour migration.

4.2 Language and ethnicity

Upper East Region is highly diverse ethnolinguistically, with at least twenty-two languages spoken in the region surveyed (Barker 1984; Kropp-Dakubu 1989). There is no *lingua franca* that serves as an effective medium of intercommunication although a type of Hausa is often used as a market speech in large towns. This diversity presumably reflects the acephalous social structure characteristic of many peoples of the region. Appendix Table 1 shows the main ethnic groups of UER.

Adult literacy remains at very low levels in Upper East. Table 6 shows the literacy rates recorded by the National Census in the year 2000. It also suggests that printed extension materials have a very restricted audience.

Table 6. Literacy rates in UER in year 2000

Subgroup	No.	%
Total	920289	
Population >15 yrs	520863	56.6
Not literate	406592	44.2
Literate in English	67071	7.3
Literate in Ghanaian language	8805	1.0

Source: GSS (2002)

It should be noted that Ghana and Upper East in particular has a very vibrant FM radio service broadcasting in several local languages. This is sporadically used for agricultural extension (Chapman et al. 2003) but has yet to be used systematically.

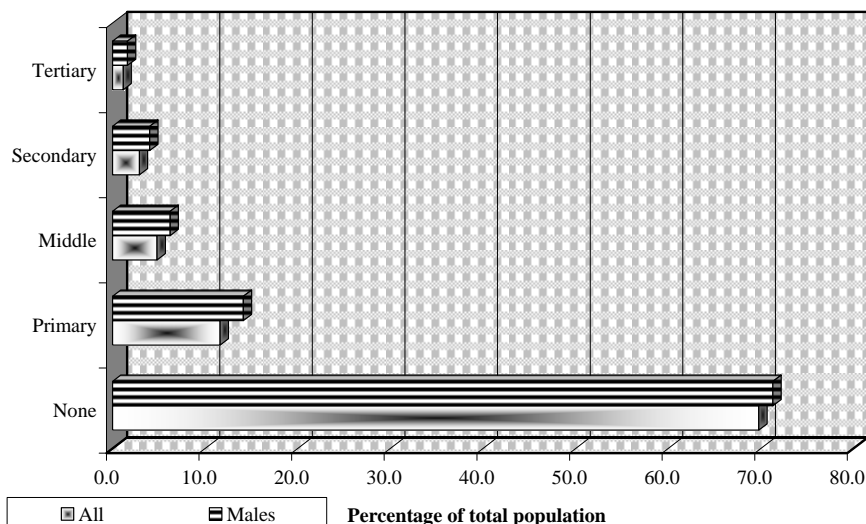
Education shows similarly low levels, although respondents to the non-beneficiary survey commented on the extension of primary education, suggesting that the figures captured by the national census in 2000 would show a significant increase by 2005. Table 7 and Figure 5 tabulate the educational levels achieved by the population greater than three years of age in 2000. The levels achieved by males are also shown. It is often said that females are strongly disadvantaged by the educational system, but when the percentages of males at different levels are compared with the total population, they are barely statistically significant in most cases, suggesting that the Ghanaian system, at least, does seriously discriminate, even at tertiary level.

Table 7. Education levels of male and total population in UER

	All	%	Males	%
None	642079	69.8	289975	71.3
Primary	106882	11.6	57384	14.1
Middle	44180	4.8	25271	6.2
Secondary	26632	2.9	16260	4.0
Tertiary	10508	1.1	6525	1.6
Total pop	920289		406747	

Source: adapted from GSS (2002)

Figure 5. Percentage education levels of male and total population in UER



4.3 Social structures

The underlying social structure in UER is the extended patrilineal family. Families form part of lineages and these in turn compose clans (Eyre-Smith 1933; Fortes 1945; Manoukian 1952; Norton 1987 and references therein). In the acephalous societies, power resided in the elders and in particular in the earth-priests or *tendaanas* who were the guardians of the land, ‘landlords’ in Ghanaian parlance.

There seem to have been no secular chiefs. With the establishment of the state-systems, chiefs were appointed in parallel with the *tendaanas* creating a system of dual authority. In the acephalous areas, the chiefs were much less able to exercise authority, partly because of the dispersed settlement patterns and because there were no traditions of respecting such individuals. Further north, there are many more landlords, many more shrines and the spiritual authority of any individual is more diffuse.

Since decentralisation in the 1990s, there has been a corresponding rise in power of the ‘Assemblyman’. The growth of the District Assembly system has meant that every substantial community sends a representative to the District Assemblies. These individuals are elected and are usually English-speakers and so create a link with the larger national infrastructure. Despite the common term, they are sometimes female, especially

in communities nearer the road. Assemblymen are often the channel for linking NGOs with villages and have thus become a third pole of power in many communities.

Photo 1. Tendaana of Telania, June 2005

4.4 Labour migration and its consequences

The relative wealth of the forest zone in terms of gold-mining, timber and cocoa have created an important magnet for surplus labour in the savannas ever since the 1920s onwards when cheap transport made possible seasonal migration (Davison 1954; Hilton 1961; Hunter 1965; Caldwell 1969). A pattern developed of young males travelling south towards the goldfields and cocoa plantations of the south of Ghana. The usual strategy was to return for the wet season and assist with farmwork. Cash wages were attractive as they allowed unmarried men to accumulate capital to buy cattle essential for marriage and, later in the life-cycle, for sacrifice at funerals. Indeed the wealth of southern Ghana was such that labourers also migrated from neighbouring Francophone countries, a drawing off of resources that accounts for the rather aggrieved tone of some of the literature (Dresch 1945; Rouch 1956; Le Moal 1960).

Another aspect of migration, however, was that it took pressure off food and other resources in areas where the human population density was high. There were less mouths to feed in the hungry season and the migrants sent back cash which could be used to buy food. As pressure on the land has increased this element has become of major structural importance in household strategies. Webber (1996a) comparing a Kusase community in UER between 1979-1993 found that the marked absence of males in the 20-55 age range had hardly changed over this period. In contrast to patrilineal systems elsewhere it is the eldest sons who are sent away and the youngest son was maintained in the household to stand in for the father.



Initially a seasonal migration, this movement of Northerners to the south took on increasing aspects of permanence. Northerners found posts in the civil service, began to run businesses and to marry and establish households in the south. This created an important support network for 'new' southerners coming to the south from any given ethnic group (Hart 1969, 1971a, 1971b). The consequence was that in reality, split households were established with a constant flow of individuals between the two. However, the notion that sons returned to work on the farm in the rainy season was strongly maintained for sentimental reasons even though it is manifestly false. Even today it is frequently presented to outsiders and is widely believed by non-northerners.

Another important aspect of the myths around northern migrants is that since the object was to accumulate cash, there was no involvement with farming. Indeed it was said that land could not be obtained in areas further south due to hostility of local populations. This too is no longer true and the Kusase have established whole communities in Brong-Ahafo producing surplus food which they send home to their families in the Bawku area as a version of food aid. It is striking, however, that they do not simply split the community and form a new independent economic unit in another location. They still regard themselves as part of the lineage located in the Kusase homeland. The overt reason given for this is that this is where ancestral shrines are located and that these cannot be transplanted.

5. Farming systems

5.1 General

UER has extremely challenging conditions for farmers, with high temperatures, erratic rainfall and eroded soils making for ever lower crop yields. Reduction or elimination of fallows and an absence of strategies for returning adequate resources to the soil, combined with labour migration that makes typical soil and water conservation strategies difficult to carry out are likely to be the true causes.

Research on agriculture in UER has been more patchy, since it has been largely conducted through the work of individual researchers. Tripp (1978, 1981, 1992) describes the agricultural systems in the Navrongo area and Benneh (1972, 1973a, 1973c) describes aspects of agriculture for Sissala villages west of Navrongo. For the Bawku area, Chilalah (1957) and Collins (1960) describe the agricultural extension work undertaken in the colonial era, Cleveland (1980) discusses household composition and demography in relation to agricultural systems and Webber (1990, 1996a, 1996b) gives a valuable account of agricultural change between 1979 and 1993. Blench (1999) surveyed the farming systems in UER and NR in the mid-1990s through a large-scale household survey.

5.2 Rainfed

The farming system in UER is based around dwarf millets, cucurbits and pulses which would normally be encountered in lower rainfall zones elsewhere (Coull 1929). Cultigen diversity is low, probably a response to poor soil fertility. Animal traction is extensively used, but not to throw up ridges that could improve rooting and counteract erosion (Lynn 1937; Panin 1986). Actual soil fertility is determined as much by the exceptional concentrations of population allied with a low-input farming system. Throughout most of UER, except in the extreme west, there are virtually no elements of the system that encourage the return of nutrients to the soil. Livestock roam freely in the dry season, but in the dry season they are taken away from the area to avoid damage to crops and the manure is effectively lost. Most trees, even leguminous ones, have been removed from the farms in order to increase cropping area. Firewood is so short that the stems of cereals are removed from the farms and used to cook food, thus not returning their organic matter. The elimination of almost all types of ground cover leaves the area prone to wind erosion.

The basis of the cropping system throughout UER is pearl millet. There are two groups of millet cultivars, a short-season millet harvested in July and a long-season millet, harvested in November or December. The dominance of millet in such a high rainfall area is striking as millet is usually associated with subdesertic regions. The early millet is interplanted either with late millet or sorghum in fields close to the compound where fertility is highest. The further fields are planted with sorghum intercropped with pulses, especially cowpeas and occasionally groundnuts. The millets of Northern Ghana have been described in more detail in Appa Rao et al. (1985) and it is worth noting that they display many unusual characteristics in terms of West Africa as a whole. These differences are so considerable as to convince early taxonomists to classify these millets a separate species, although they are regarded today as race *globosum*.

Maize underwent a burst of popularity during the period when fertilisers were available at subsidised rates. However, few farmers reported planting it in 1997 since no fertilisers were available and soil fertility, if anything, has declined still further. Rice (*Oryza sativa* not African rice) is planted in swampy lowlands and there are small pockets of fonio along the Togolese border.

Despite their importance in UWR and NR, tubers are only of minor significance in UER. The 'Frafra potato' (*Plectranthus esculentus*) was formerly extremely common in the Bolgatanga area, but is now only a minority crop. New sweet potato cultivars have made some impact in valley-bottom and irrigated dam sites, but are more a cash crop than a staple.

5.3 Irrigated

Early records of agriculture suggest that all types of irrigation or flood-retreat agriculture were virtually unknown in the pre-colonial era. These labour-intensive production systems were probably inappropriate for populations which depended heavily on gathered produce and rainfed swidden agriculture. A factor that may have acted as a discouragement is the presence of river-blindness (onchocerciasis) along all the major water-courses. This has caused populations to retreat from the most fertile areas and subsequently to return to them once a health equilibrium has been established (Hunter 1966; Patterson 1978).

However, the pressure on land and the need to produce cash crops for sale has gradually brought about innovative farming techniques. It seems quite likely that Muslim migrants such as the Zarma and the Hausa were the first to practise horticulture in riparian areas. Many of the larger rivers are still not exploited in this way for lack of adequate methods of lifting water². However, most shallow rivers and seasonally flooded land are now given over to dry-season gardening in UER. From the 1950s to 1960s there was an extensive programme to create 'dugouts', small dams for trapping water for both humans and livestock in the dry season. Typically, gardens can be established along their edges as well in places where seepage allow shallow wells to be dug. Some of these dugouts were later converted to irrigated cropping by the Ghana Government. Later, with IFAD projects such URADEP and LACOSREP, as well as World Bank projects, these formers dams and dugouts were rehabilitated to more structured small-scale irrigation. It is now thought there are some 240 dams and dugouts in UER.

Apart from these small-scale operations, the Ghana Government has established at least one larger scheme, at Tono. This scheme of 2400 ha was developed for small and medium scale farmers and operated on a system where inputs were provided and repaid at harvest. Originally productive, but significantly subsidised, it is now being gradually privatised. The high cost of inputs and a poor market for rice following uncontrolled imports has made cultivation much less attractive and many plots are now unused.

At smaller dam sites, dry-season cultivation is mainly vegetables, most commonly onions and tomatoes. In the early period, lettuce, pumpkins, cucumbers and watermelon were brought in, but these are now of minor significance. Onion cultivation is particularly popular and represents one of the most important agricultural exports from the region. The storability of onions has made it possible for astute producers to play the markets, a capability enhanced by mobile phones. Producers can establish when prices are favourable in southern markets, rapidly aggregate stocked onions and sell within a couple of days. The situation with tomatoes is much less attractive since the trade is controlled by 'market queens' who use their perishability to force producers to accept low prices. Recently, they have been buying from Burkina Faso to dramatise their situation as monopoly buyers. It seems likely that dry-season cultivators will turn increasingly towards crops that can be stored, dried or find a strong local market, like okra and green leaves.

5.4 Land tenure

The land tenure systems of Northern Ghana have been described by numerous authors (Pogucki 1950; Ollenu 1962; Der 1975; Bening 1976; Benneh 1976; Cheshire 1977; Abdulai 1986; Rufai 1987).

There are two elements in understanding tenure systems in this region;

- a) the division between farm and bush
- b) the independence of trees from the land on which they grow

Until the colonial era the principal method of farming was shifting cultivation; villages moved within a demarcated zone, clearing the woodland, farming for some years and moving on. Allocation of lands in bush

² In other neighbouring countries, such as Nigeria, small petrol pumps were introduced by Agricultural Development Projects to lift water to gardens and these are still widely used despite being no longer subsidised. It may be that the technology has so far failed to transfer to this region or that the transport infrastructure to bring horticultural products to market is too weak for their use to be economic.

farms was through the earth priests, *tendaana*, but the abundance of land was such that competition for land was almost absent. Trees in the bush and preserved on farms were the property of the chief or earth-priest and could only be harvested or cut with their permission.

Farms were divided by classes according to their productivity. Home farms and those in valleys or along rivers farms were the most valuable and could be cultivated continuously, while the bush farm was cultivated with a bush fallow system. Such land is held by the village/lineage and cannot be alienated (Benneh 1973a). Ownership of economic trees on farms has devolved to the individual who develops the land but the ownership of economic trees in the bush has now become a matter of dispute in some areas. In the Dagomba area, the chief and his assistants still try to enforce controls on the exploitation of these trees, but elsewhere, especially in UER, these have effectively collapsed. The first individual to reach a tree can harvest its fruit.

These land tenure systems have been generally maintained up to the present. Although land is bought and sold around larger urban settlements, such as Bolgatanga, intense pressure on land in rural areas has not led to a monetarisation and individualisation of land rights as has been reported elsewhere in West Africa. Instead it has resulted in a consolidation of lineage holdings and a sharpening of boundaries. This unusual situation seems to reflect the continuing importance of traditional religion and the maintenance of lineage solidarity combined with the realisation that an individualisation of landholdings will rapidly lead to social and economic stratification.

5.5 Land use planning

The particular problems of the granite areas of Upper East Region have been recognised since the 1930s and the notion that population and land use planning was the appropriate response go back at least to Lynn (1937, 1942). Lynn argued that a combination of;

- a) already high population densities
- b) fragmentation of holdings
- c) uncertain rainfall
- d) uncontrolled livestock movement
- e) low-yielding crop varieties
- f) lack of inputs
- g) lack of anti-erosion measures

meant that economies of scale were not operative and that the unsustainability of agriculture could only increase. The end-process of his work was the North Mamprusi Forestry Conference of 1947, where a series of Forest Reserves were established in selected areas along the main watersheds. With additional funding and technical advice from the IDC, these were established as Land Planning Areas (LPAs) (Hilton 1959).

Some success were recorded in controlling burning and grazing, the construction of contour terraces and small check-dams. However, the immediate recommendations were that a large proportion of the human population of some LPAs would need to be moved. In the case of the Frafra resettlement area this was estimated at some 80,000 individuals (Hilton 1960a). It was felt that this could be achieved through extension ('Mass Education' and 'organised propaganda' in the language of the period). In the event this was almost a complete failure and numbers have continued to rise in UER (e.g. Hunter 1965, 1967).

Land use planning has been largely based on a concept of policing rather than working with communities to manage land and forest resources. Attitudes are changing, both in the NGO sector and in official policy (Alebikeya 1988; Ashie Kotey 1992; anon 1995; Wardell 1996) a trend that has continued with decentralisation. Importantly as well, the rise of substantial internal migration within this region is leading to increased communal conflict. This has been thrown into sharp relief by the issue of *galamse* or semi-legal gold-miners. With the modernisation of many mines in the Ashanti area, miners were thrown out of work and one solution was re-open low intensity fields in UER last worked in the 1930s. Miners have come from many places in West Africa and invaded both farmland and forest reserves. An absence of safety standards has

resulted in deaths and injuries as well as pollution of groundwater by mercury used to separate the gold. The regional assembly has no easy solution to this problem; they must deplore these invasions, while welcoming the wealth and employment it generates for UER. Indeed, many households observed that their young men now go for *galamse* rather than migrating south.

6. Livestock

Northern Ghana is often characterised in the South as a livestock region, and especially in the drier regions where agriculture is problematic. This stereotype is only partly true, with significant numbers of poorer households only possessing a few goats and chickens. Descriptions of livestock systems can be found in Hall (1999) and Blench (ms.). Table 8 draws on a survey conducted in 1997 to show the incidence of ownership of particular livestock species throughout NE Ghana;

Table 8. Incidence of livestock ownership by species
n=529

Species	No	%
Cattle	313	59.2
Sheep	372	70.3
Goats	465	87.9
Pigs	122	23.1
Dogs	317	59.9
Cats	301	56.9
Donkeys	51	9.6
Horses	8	1.5
Rabbits	26	4.9
Guinea-pigs	8	1.5
Chickens	517	97.7
Ducks	150	28.4
Guinea-fowl	403	76.2
Turkeys	12	2.3
Pigeons	75	14.2
Bees	33	6.2

Source: Blench ms.

In the case of the major economic species, there are marked regional differences in the incidence of species kept. Table 9 shows the differential incidence of livestock ownership in NR and UER. The Islamic ideology of many Dagomba militates against pig production, even among those who are no Muslims. By contrast, pigs are very common among the acephalous peoples of UER.

Table 9. Regional incidence of livestock ownership

Region	n	Cattle	%	Sheep	%	Goats	%	Pigs	%
Northern	222	94	42.3	138	62.2	181	81.5	1	0.5
Upper East	307	219	71.3	234	76.2	284	92.5	121	39.4

Source: Blench ms.

Livestock keeping represents a major coping strategy in a semi-arid region with uncertain rains. The other livestock species kept in northeastern Ghana include horse, donkeys, goats, sheep, pigs and poultry of various types. There are virtually no intensive production systems in the region and small stock are allowed to forage freely in the dry season and confined in the wet. In the case of minor species, such as rabbits, guinea-pigs and poultry other than chickens these are spread fairly evenly throughout the area and their distribution reflects individual enthusiasm rather than sociocultural differentiation. The decade since 1995 has seen a rapid increase in numbers of donkeys in the region and these are now widely used in both traction and to pull carts. The replacement of the natural vegetation with species unpalatable to cattle has favoured this trend.

The principal cattle breed herded in Northern Ghana is the West African Shorthorn (WAS) albeit with substantial introgression of zebu genes in some places. These cattle are very hardy and well adapted to a difficult environment. Work-oxen represent a relatively recent innovation, but prior to that all cattle were allowed to roam freely in the dry season (as also goats, sheep and pigs). In the wet season, small ruminants and pigs were tethered or confined. Wet season management of the herds was left to children, often with deleterious effects. The rapid spread of dry-season cultivation has created a conflict with livestock producers. Animals tend to be close to dams rather than 'roaming around' as it is easier to water them. However, they then more frequently enter gardens unless these are fenced. As the area behind the dam floods every season, wooden and mud fencing is washed away and has to be rebuilt annually, which represents a major labour cost.

The marketing of livestock has historically been a subject of considerable controversy. Historically, Northern Ghanaian peoples have been regularly accused of withholding stock from the market and being uninterested in the improvement of livestock for sale (see, for example Wills 1962:219). Throughout UER, cattle (apart from draught animals) are produced principally for marriage payments and sacrifices at funerals. This is not because farmers are not market-oriented in certain spheres, even including livestock, because there is good evidence that the notion of investing in pigs to improve their sale price is currently spreading. Pigs play little or no role in major ritual activities and indeed can be kept by women and are thus highly suitable for income generation. The role of cattle in sacrifice, however, completely excludes them from this sphere of activity. This is confirmed by concrete production characteristics of the cattle (Hall 1999).

7. Markets, commodity and input prices

7.1 Markets

It seems that there was no very elaborate trading system in precolonial times, and that the present markets all developed in the twentieth century. Various authors have described the systems of periodic markets operating in this region (Manshard 1961; McKim 1972; Mahn 1980; Hill 1985). The completion of a sealed road to Bawku has made it easier for agricultural producers to get out their products; however, distance is still a factor in determining profitability. Previously, farmers were at the mercy of a small ring of traders in collusion with one another and had little access to market price information. Expanding education and communications networks has changed this and now there are direct connections with both southern and transnational markets. Bolgatanga remains the principal regional market, but Bawku is also a significant trading centre.

7.2 Agricultural commodities

7.2.1 Crops

Commodity prices in UER have been regularly monitored since the early 1990s, so it is possible to gain a picture of price patterns over the decade 1995-2004. The prices given here are based on annual means. Commodities for which data are available are maize (Figure 6), millet (Figure 7), guinea-corn (Figure 8), onions (Figure 9) and tomatoes (Figure 10).

Figure 6. Wholesale maize prices in UER, 1995-2004

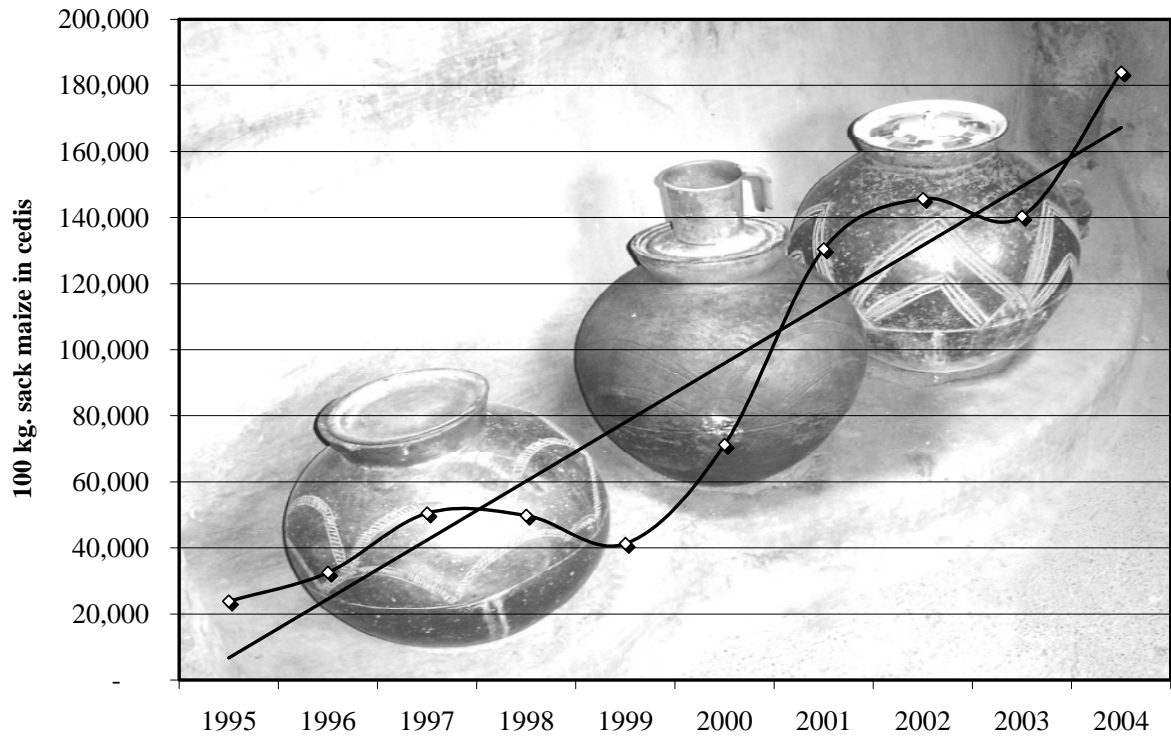


Figure 7. Wholesale millet prices in UER, 1995-2004

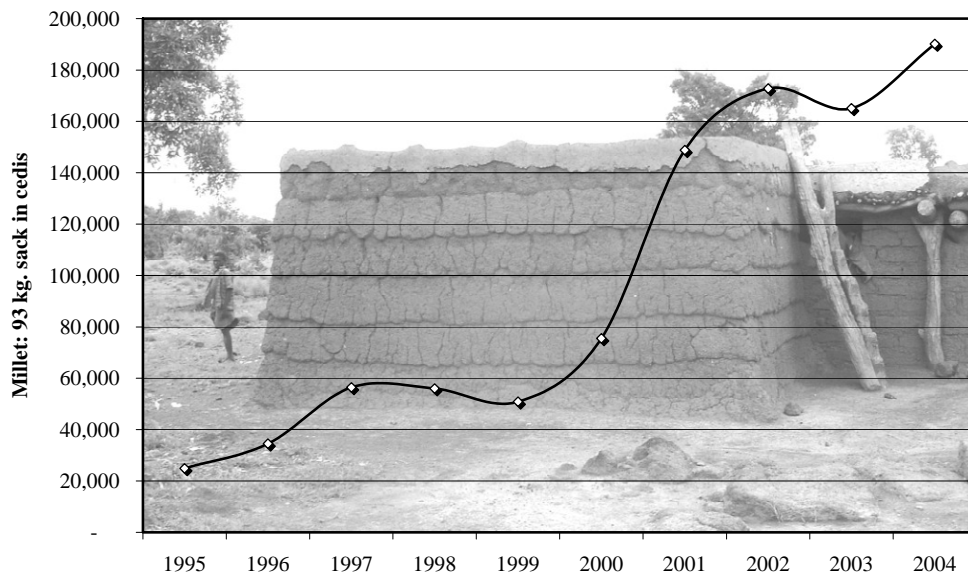


Figure 8. Wholesale guinea-corn prices in UER, 1995-2004

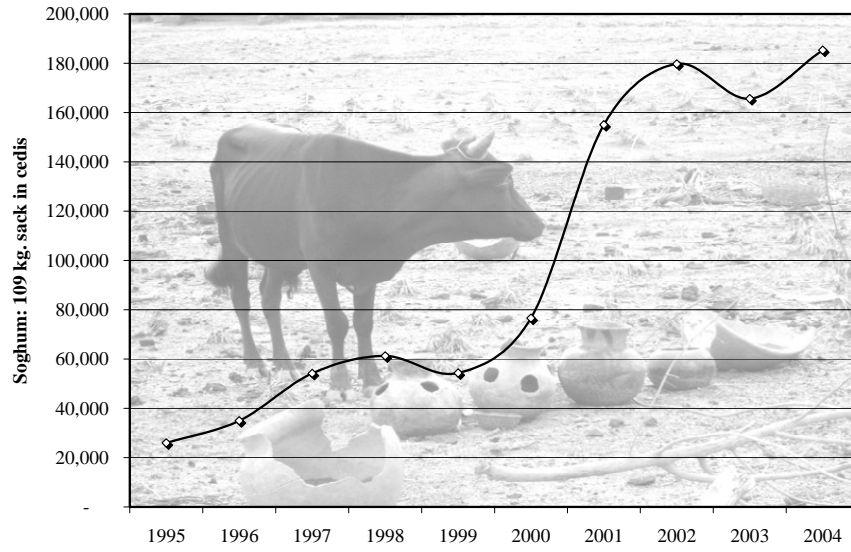


Figure 9. Wholesale onion prices in UER, 1995-2004

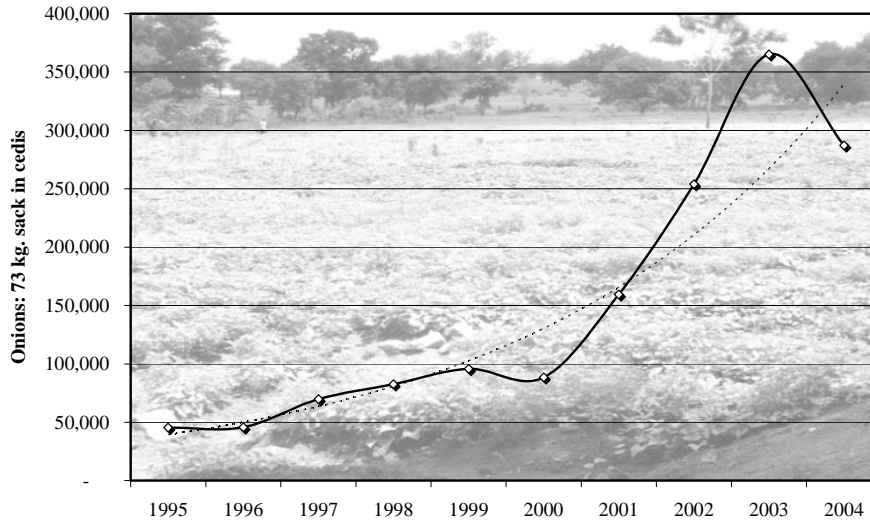
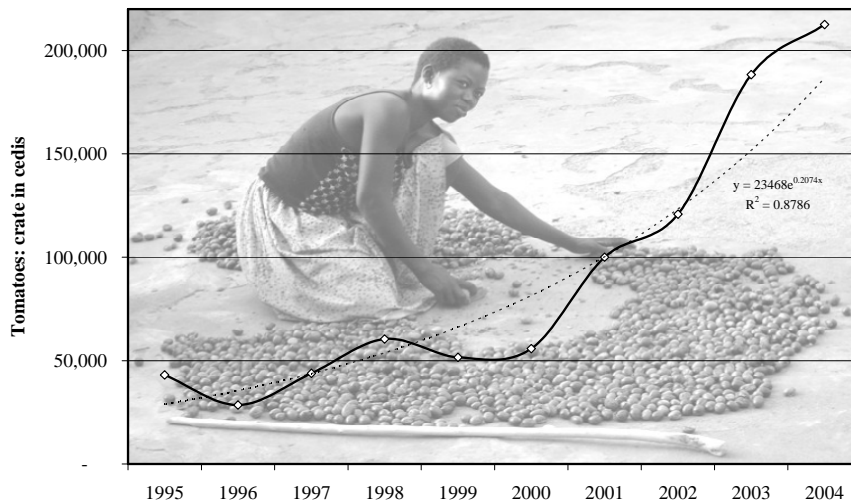


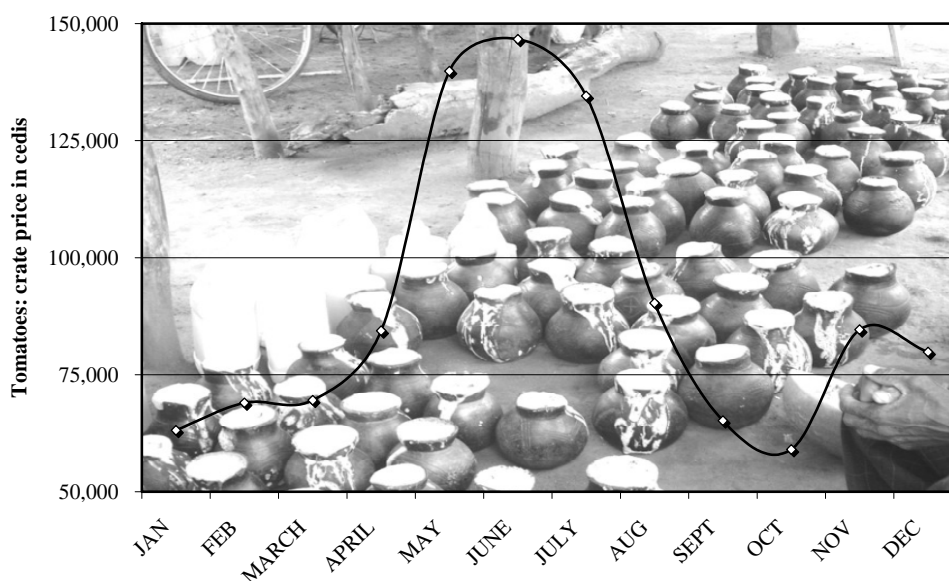
Figure 10. Wholesale tomato prices in UER, 1995-2004



The pattern for all these commodities is virtually the same; prices rise slowly until the year 2000, when they rise sharply and keep on climbing thereafter. Curiously, there is no evident explanation for this pattern. Rainfall patterns do not match this, nor was there a sudden fall in the value of the cedi. Fertiliser prices have risen in this period, but neither so sharply or uniformly (Figure 19). Locally, it is common to attribute this rise to increased fuel prices around this period but this would have only been a very temporary effect. More likely is the impact of improved health-care on infant survival rates (Table 11). Fewer children dying means more mouths to feed and limited opportunities to counterbalance this with migration. So households are probably reserving more staples to feed their members and thus forcing up the price of surplus staples.

The price of crops can also vary substantially within the year, but perishable tomatoes show the greatest variation. A glut on the market in the early dry season forces prices down to their lowest level, while the highest prices are attained when farmers are planting staple cereals in the early rains. Figure 11 shows the intra-annual price variation in tomatoes averaged out over the period 1995-2004.

Figure 11. Intra-annual price variation in tomatoes, 1995-2004



Farmers in UER are now firmly connected to the national system and the viability of their farm enterprises is strongly affected by both prices of inputs, communications and transport and government policies on imports. Recent moves by government in Accra to import cheap maize and rice to satisfy the urban constituency, contrary to its own expressed food and agriculture policy, will certainly have a major impact on surplus production of staples in UER and is likely to further impoverish farmers already on the edge.

7.2.2 Livestock

7.2.2.1 Market prices over time

The market for livestock in UER is quite different from crops, since animals are required for work and also for sacrificial purposes, especially for funerals. Sheep show strong seasonality as they are bought prior to Muslim festivals. Pigs, chicken and guinea-fowl are the main species bought and sold as a smallholder commercial enterprise. The gradual switch to cost-recovery veterinary services has affected the supply of animals since many herds and flocks have been wiped out by epizootics. Although it seems evident to policy makers that owners should spend a few thousand cedis to protect animals worth considerably more than that, in a cash-poor economy with uncertain food supplies, even those expenditures are hard decisions and many owners seem willing to take risk. Wholesale prices in UER for livestock are shown in Figure 12 (cattle), Figure 13 (sheep), Figure 14 (goats), Figure 15 (chickens) and Figure 16 (guinea-fowl).

Figure 12. Wholesale cattle prices in UER, 1992-2004

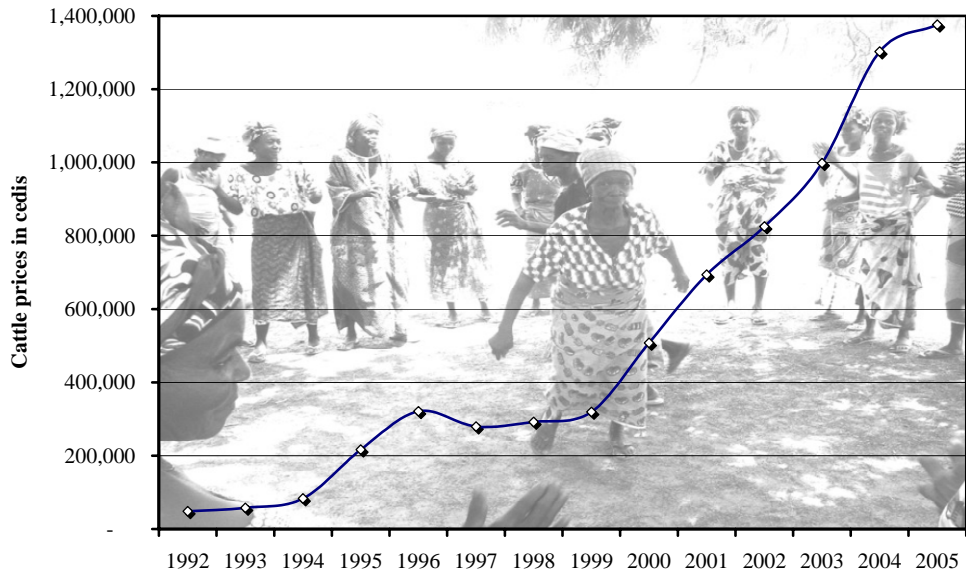


Figure 13. Wholesale sheep prices in UER, 1992-2004

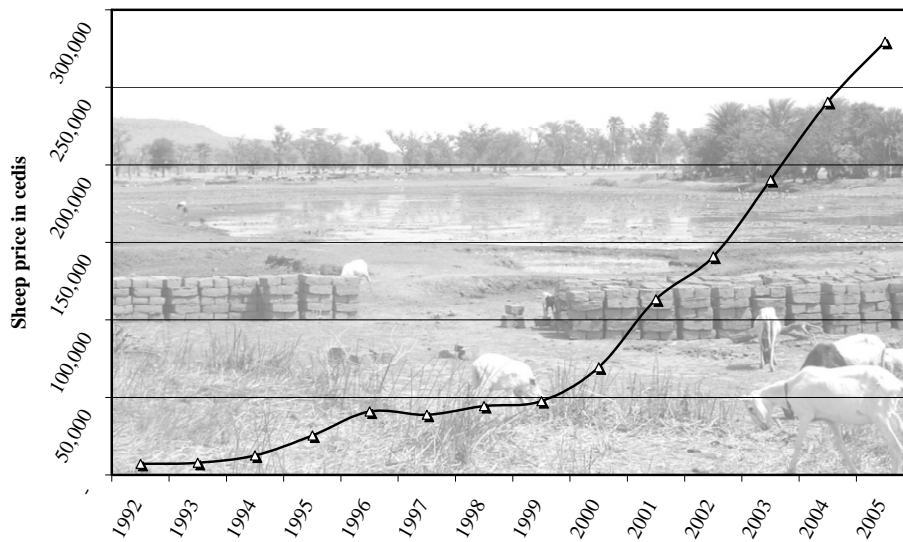


Figure 14. Wholesale goat prices in UER, 1992-2004

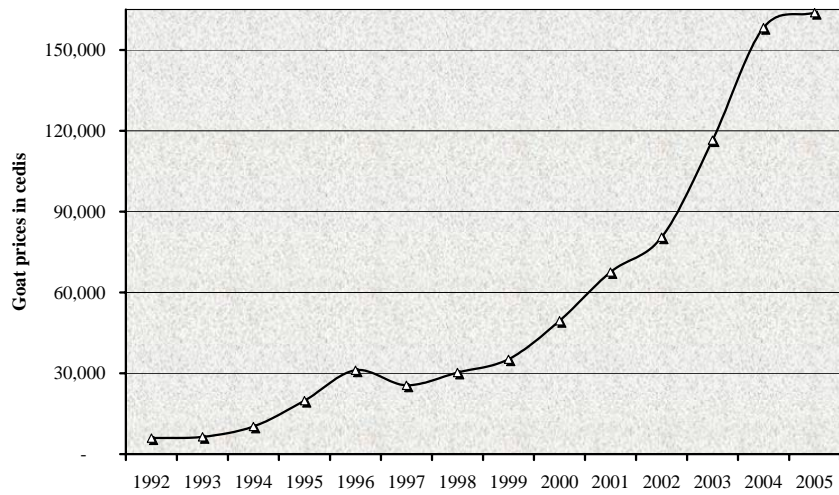


Figure 15. Wholesale chicken prices in UER, 1992-2004

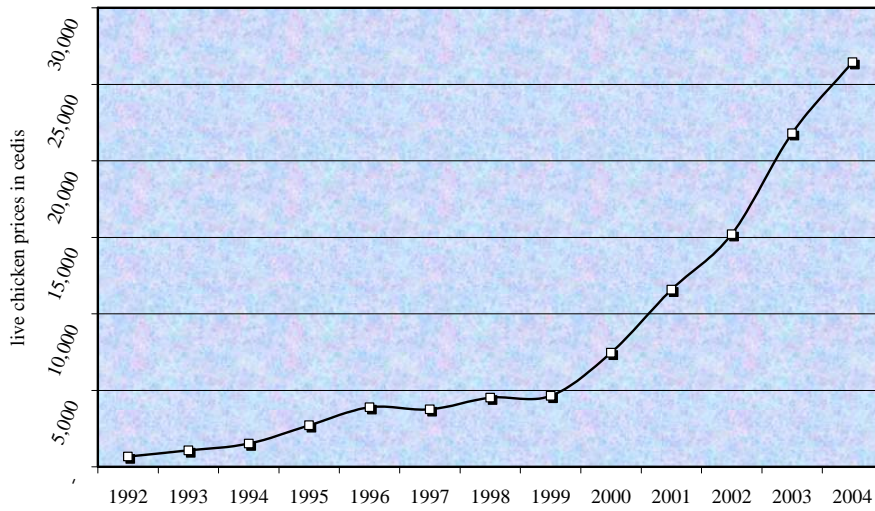
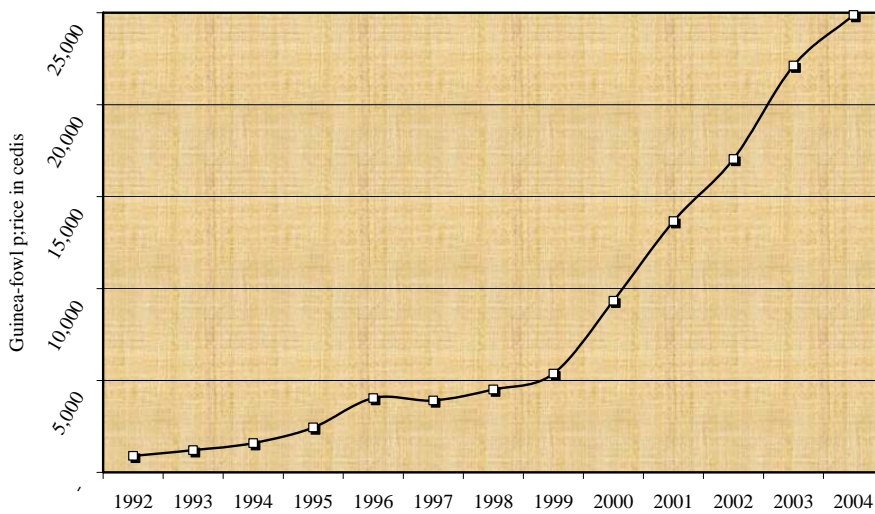


Figure 16. Wholesale guinea-fowl prices in UER, 1992-2004

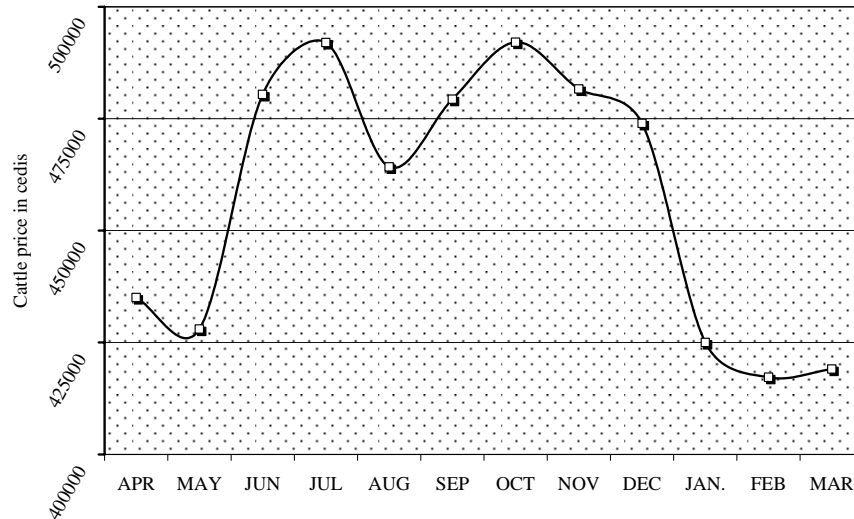


These price patterns show intriguing similarities to crops, except they are shifted one year previously. In 1999, prices begin to climb sharply, a trend which continues up to the present. At present there is no clear explanation for this, nor why the difference with crops.

7.2.2.2 Seasonality of market prices

Seasonality in livestock prices tends to reflect cultural demand for individual species. For example, variation in demand for cattle across the year is not very marked, because of their use in funerals. As a result, fluctuations are only a small proportion of the overall sale price.

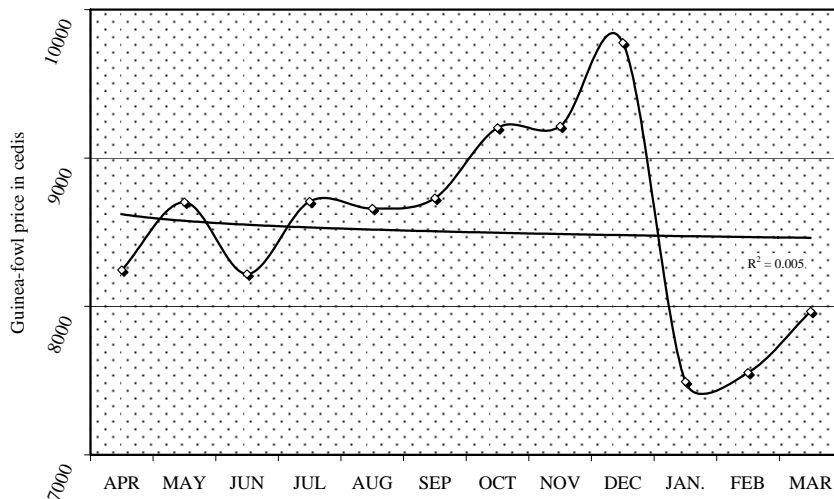
Figure 17. Seasonal cattle prices in UER, 1992-2004



The lowest prices for cattle are in the dry season, and this certainly reflects the sale of weak animals and salvage sales as well as the need for cash to pay school fees and even to buy staple foods. during the farming period, when the animals are well-fed and often away from the farms, sales are less and prices correspondingly higher.

With poultry, by contrast, Christmas represents a strong and highly seasonal demand, as **Figure 18** illustrates very clearly. Prices slump to their lowest level in January, when festivities are over and there is little spare cash in the local economy.

Figure 18. Seasonal guinea-fowl prices in UER, 1992-2004



7.3 Inputs

The use of farm inputs has been strongly driven by the passing enthusiasms of agricultural development projects. Manure was traditionally used, especially in the UER, to increase the fertility of the fields and is still collected and redistributed throughout much of the region. The first inorganic fertilisers were introduced into the region by the colonial government in the 1950s and gradually became a substitute for maintaining soil fertility by traditional means. Through much of the post-Independence era, fertiliser was heavily subsidised. However, the subsidies were progressively eliminated after 1983, with the consequence that they became too expensive for many farmers. Farmers who work with the cotton companies still receive fertiliser at below market prices, but this is now small minority with the collapse of cotton. Use of pesticides is much less common and is often confined again to chemicals used on cotton or for cowpeas. Herbicides are hardly known and indeed often not readily available.

As part of a survey in 1997-8, a large sample of farmers were asked about their use of agricultural inputs. Table 10 shows the percentages of farmers using different input types;

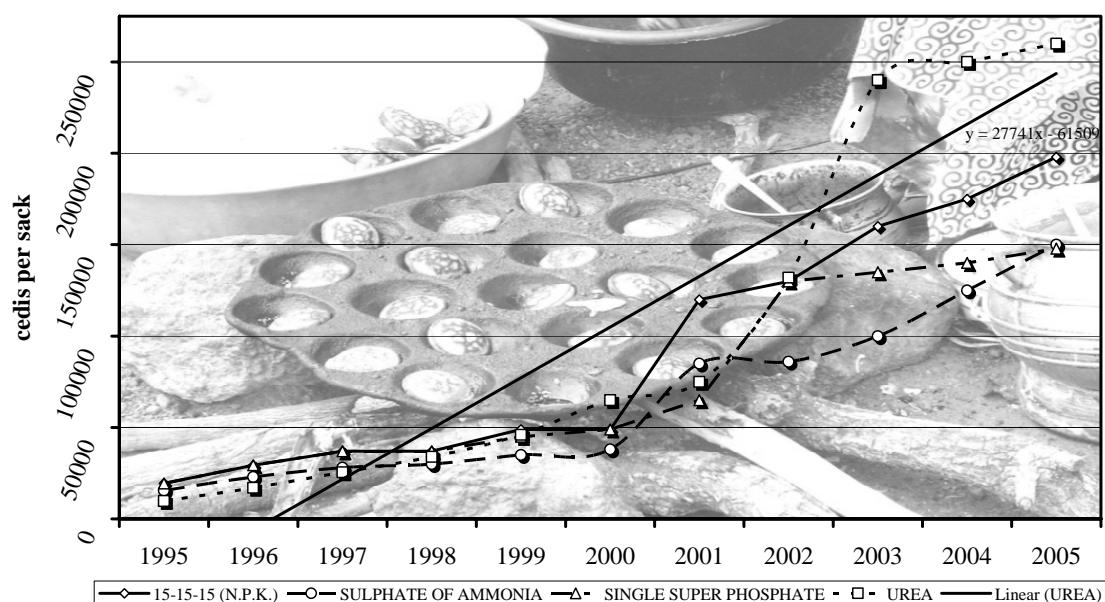
Table 10. Percentage of farmers using different inputs

		n=529					
Yes or No Fertiliser	%	Manure	%	Pesticides	%	Herbicides	%
No	153 28.9	114 21.6	330 62.4	505 95.5			
Yes	376 71.1	415 78.4	199 37.6	24 4.5			

Source: Blench (1999:38)

Farmers regularly emphasised that increasing prices since the mid-1990s had both decreased the proportion of farmers using inputs and the quantities used. Figure 19 shows the market prices of different types of fertiliser in UER, 1995-2004, covering the life of LACOSREP I & II.

Figure 19. Fertiliser prices in UER, 1995-2004



Fertiliser prices took off sharply around the year 2000, which was presumably one source of the rise in commodity prices. Urea, from being much the same price as other types, has now far outpaced them.

8. Human health and well-being

8.1 Nutrition and epidemic disease

The low investment in agricultural labour and hence in soil and water conservation also reflects the poor state of health of many individuals in UER. The low output from the farming system is responsible for marked seasonal hunger, low bodyweights and systematic malnutrition of all sections of the population (Hunter 1967c; Tripp 1978, 1981, 1992; Benneh 1985). This makes the populations particularly susceptible to the epidemics of cerebro-spinal meningitis that sweep through the region every dry season, often with considerable mortality.

The health status of populations in the three northern regions of Ghana reflects the absence of health services and poor nutrition due to regular 'hungry seasons'. Regular surveys by the Ghana Health and Demographic Survey from the 1990s have made it possible to gauge the situation more accurately than previous anecdotal material. Table 11 shows total and disaggregated under-five mortality for Upper East and Upper West over the decade 1993-2003.

Table 11. Neonatal, postneonatal, infant, child, and under-five mortality rates* 1993-2003

Region	Neonatal	Post-neonatal	Infant	Child	Under-five
Upper East	22	11	33	48	79
Upper West	62	43	105	115	208

* per '000 births

Source: GHDS (2003)

These rates remain stubbornly high, but despite its production problems, UER is significantly lower than UWR, which probably reflects the better communications and implantation of more clinics in the 1990s. This is confirmed by corresponding nutritional studies which show much less difference between the two regions. Table 12 shows a comparison of UER and UWR for three anthropometric indices measured in 2003;

Table 12. Nutritional status of children

Percentage of children under five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, Ghana 2003

Region	Height-for-age			Weight-for-height			Weight-for-age			N
	% below -3 SD	% below -2 SD1	Mean Z-score SD	% below -3 SD	% below -2 SD1	Mean Z-score SD	% below -3 SD	% below -2 SD1	Mean Z-score SD	
Upper East	12.1	31.7	(1.3)	2.4	12.9	(0.8)	7.8	32.4	(1.4)	156
Upper West	12.6	34.1	(1.3)	2.6	11.0	(0.3)	6.0	25.9	(1.0)	95

Source: GHDS (2003)

The similarities suggest that lower mortality in UER is a consequence of better access to medical services.

8.2 Chronic disease

Apart from general poor health, populations in UER are afflicted with chronic debilitating diseases which cause lowered productivity. Most notable are guinea-worm, schistosomiasis, malaria and soil-transmitted helminths such as hookworm (Amankwa et al. 2003). Almost all of these are related to infected water sources and regrettably, dams, which increase agricultural production also increase their incidence. Surveys among school-age children show that levels of infestation may be actually increasing, especially hookworm (Dery *et al.* 2004). Of Northern Ghanaian districts surveyed, Bongo District had the highest incidence of multiple worm infestations. NGOs such as ADRA have been active in awareness campaigns to try and

change behaviour in relation to water use. Public health, however, is strongly affected by the availability of donor funds and these are lamentably subject to passing fashion.

9. Institutional background

9.1 Government and decentralisation

Government in Ghana was traditionally highly centralised in Accra and bureaucrats throughout the north sourced from the south. During the 1990s, Ghana embarked upon a bold experiment in devolving power to the regions and districts. Both regions and districts have elected assemblies which have some powers in the provision of public services but as yet are unable to raise major taxes. Innovations deemed to be of national relevance, such as forest and wildlife reserves, are beyond their powers; they cannot revise legislation relating to them. However, some of the reforms in progress may change this state of affairs.

In the light of this change, donors are now channelling funds through regional and district assemblies. This has good and bad elements; it increases massively the transaction costs of getting decisions made both in terms of time and because political constituencies have to be satisfied. Assemblymen are, as they say, 'hungry' and anxious to be re-elected, which means they need projects to be sited in their districts. The consequence of this is often the opposite of pro-poor policies; the communities and individuals which shout the loudest get the resources. In addition, local contractors have strong links with the assembly and can lobby for contracts. In the case of infrastructure provision, they may be awarded jobs far beyond their capacity.

Nonetheless, the positive side of this is that local people are taking charge of their future, for better or worse. The bored patricians from the south who used to occupy every government office have been turfed out by individuals who must answer to their own people. Northern educational institutions are gradually turning out graduates able to fill government posts in their own region. The next key step is to make the case for northern development effectively at the level of central government; some of the mismanagement consequent on local political considerations can create a negative image at national level.

9.2 Multilateral and bilateral aid agencies

Northern Ghana has been the site of a series of major initiatives by multi-lateral agencies, starting with a FAO study in 1977, reprised by FAO/IFAD in 1989. In the early 1980s, a 'Northern Region Integrated Project' (NORRIP) was conceived to take an integrated approach to planning and agricultural development (anon. 1983). IFAD designed an 'Upper Region Agricultural Development Project' (URADEP) to cover both Upper East and Upper West at the time when they constituted a single region. Its successor projects, LACOSREP I and II (appraised 1992 and 1999) and UWADEP (appraised 1995, closed 2004) concentrated on small dams and a raft of other agricultural and livestock interventions with a strong emphasis on gender and capacity building.

The World Bank initiated a National Livestock Services Project (NLSP) in 1993 to improve veterinary care, to finance the construction of communal water holes and introduce the use of improved pastures. During the same period a Forestry Resource Management Project (FRMP) was undertaken, principally in the South. A second phase, the Savannah Natural Resource Management Project (SNRMP) was intended to address savannah forestry issues more directly, but poor management led to its being halted partway through its life. The World Bank has also supported VIP (Village Infrastructure Project) intended to developed demand-led projects and its successor, CBRD (Community-based Resource Development).

Bilateral donors have had much less direct input into Northern Ghana, preferring to finance NGOs or to work through budget support to the Accra government. Two exceptions to this are DANIDA and CIDA, both of which have financed a series of relatively small-scale interventions in the areas of dams, agroforestry and literacy.

9.3 NGOs

If signboards are held to constitute development, then Northern Ghana has no further need of it. The roads to many villages are festooned with a clutter of signs inscribed by both NGOs and UN agencies announcing the various development assistance initiatives taking place in the village. Within the villages numerous signs proclaim the projects under way. Ghanaian NGOs have been reviewed in Alebikiya (1993) and Amanor et al. (1993) although for obvious reasons these accounts are fairly anodyne.

NGOs represented include large well-funded international organisations such as OXFAM and Save the Children fund, as well a host of smaller operations. Church-based NGOs are important and all the major denominations have some type of operation. ADRA, the Adventist Development and Relief Association, is one the largest players, both in Northern Ghana and in adjacent Burkina Faso. In UER, Actionaid is one of the most important players with a major operation in Bawku with subsidiary stations elsewhere in the region. Technoserve, which focuses on appropriate technology has offices in UER.

There has been no overall evaluation of the impact of NGOs on the regional economy and in particular food security. But critics of this multiplicity of organisations note that despite their efforts, food shortages, migration and malnutrition remain at high levels. Is it possible that they simply create aid dependency rather than providing sustainable solutions? The problem may be that it is impossible to establish what the situation would be like in their absence. However, part of the reason for citing early descriptions of land and resources problems in Upper East is to suggest that farming systems have been unsustainable for more than seventy years and even if a development agency has a positive local impact, this represents only a minor reversal of a trend for the gap to become ever wider.

10. Conclusions; general trends

The situation in Upper East Region is very intractable; despite long years of development assistance, many communities remain poor, vulnerable and suffer from regular food shortages. Recent improvements in health care have improved child mortality with the consequence that the human population may be rising faster than a backwards projection from 1984 would suggest. Such pressure inevitably results in further deterioration of land resources, greater deforestation and depletion of water resources. The historical response has been migration, which remains at high levels. Successes in development can lead to a slowing of migration, but they also then add to the numbers of mouths to feed.

This should not be taken as justification for the 'Accra view' a general opinion that development has failed in the North and that the logic of continuing to invest there can be questioned. Part of the dynamic of continuing shortages in the semi-arid regions is the migration of key elements of the labour force to build the economies of the south. This suggests there is an important ethical imperative to continue investment in all three northern regions, but that it should be part of an overall development strategy for Ghana as a whole.

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Appendix Table 1. Peoples and Languages of UER

The bold headings in column II show the linguistic classification of the group.

Usual Name	Autonym	Location
	Grusi	
Kasem	Kasem	UER
Sissala	Tumuli	UER
Sissala	Pasale	UER
Chakali	Chakali	UER
Tampulma	Tampulma	UER
Konkomba	Konkomba	UER/NR
	Oti-Volta	
Bulsa	Builsa	UER
Koma	Kɔnni	UER
Moba	Moba	UER
Moshi	Mõõre	UER
Frafra	Gurnsi	UER
Nankane	Nankansi	UER
Nabti	Nabit	UER
Kusaal	Toende	UER
Kusaal	Agole	UER
Tallensi	Talnsi	UER
Nankani	Nankani	UER
Dagomba	Dagomba	UER/NR
	Others	
Bisa	Bisa	UER
Hausa	Hausa	UER/NR
Zaberma	Zarma	UER
Fulani	Fulɓe	UER/NR