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On the move
Livelihood Strategies and Income Diversification in Rural Northern Ghana

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Francesca Marchetta

Coordinatore del corso di dottorato: prof. Giovanni Andrea Cornia

Relatore di tesi: prof. Donato Romano

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Contents

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1. Introduction

Three billion of people are still living in rural areas around the world, and approximately 86 percent of them draw their incomes from the agricultural sector (World Bank, 2007). Most of them are poor. The World Bank devoted the 2008 edition of its *World Development Report* to agriculture, drafting an agriculture-for-development agenda aiming at sustainable growth and poverty reduction.

Although the incidence of rural poverty has been falling on aggregate since the early 1990s, Sub-Saharan Africa recorded an increase over the same time period. Thus, poverty reduction in this region requires a sustained development of the agricultural sector - something that has been for long neglected by prevailing development theories - and of additional sources of income in the rural areas.

In Sub-Saharan Africa, farmers are currently facing severe challenges due to a poor asset base: demographic pressure is increasing, the average farm size is small, land degradation is on the rise, most of the crops are obtained from rain-fed land and water represents a scarce resource. Furthermore, land yields suffer from the limited technical skills, poor education and health conditions of most farmers. Rural non farm employment is a badly-needed alternative for the households which are adversely affected by a stagnant agricultural sector. In fact, one of the four policy objectives set out by World Bank (2007, p. 228) is to "increase employment in agriculture and the rural non farm economy, and enhance skills".

Non farm activities and migration have been recently attracting an increasing attention in the economic literature, and in the policy debate. Despite the still largely predominant role of agriculture for most rural areas, several studies claim that non farm activities and migration are on the rise, and there are well-grounded reasons to expect that the process of diversification of income sources should gain farther momentum over the years to come.

Non agricultural incomes already account for a share ranging from 20 to 75 percent of total household incomes in the rural developing world (Davis, 2007). Most of this income stems from retail trade and services, while manufacturing is seldom developed, and often limited to agro-processing. Non agricultural wage employment plays an important role in Latin American and Asian countries, while in Sub-Saharan Africa self-employment in family-run micro enterprises prevails, and wage employment is rare.

The share of the agricultural sector in a country's gross domestic product has often been taken as a synthetic yardstick of the process of structural transformation that should accompany economic growth (e.g. Chenery and Syrquin, 1975). The long-standing tradition of this indicator notwithstanding, it is unclear whether a fall in the agricultural share should be necessarily equated with a process of development. The rise of non farm activities could be pushed by and revealing the crisis of the agricultural sector. Although the employment in the rural non farm sector could represent a good source of income, it should not be neglected that this may as well represent a sort of shelter for immiserizing farming households.

Furthermore, the growth of the non farm sector is not always beneficial for the rural poor, and this entails that the poverty reduction potential of this sector should be carefully assessed, rather than being assumed as a leap of faith. Some studies emphasized that the most profitable non farm activities are characterized by significant barriers to entry – e.g. financial or human capital requirements – that hinder their accessibility for the poor, who are often bound to low-return activities that do not offer them a way out of poverty. In such a context, the development of the non farm sector could determine a worsening of income inequality (Davis, 2007).

Migration out of the rural areas represents a second potential response to the agrarian crisis, provided that migration costs do not prevent poor households from resorting to this strategy (Mendola, 2008); migration reduces the demographic pressure on scarce resources, and it could give rise to substantial flows of transfers to migrant sending households. The World Bank (2005) stresses that remittances to developing countries have been steadily increasing since 1980, and amount to several times the flow of official development assistance to these countries. Given the relevance of unrecorded informal transfers (Freund and Spatafora, 2005), it is hard to overstate the relevance of this revenue item of the Balance of Payments of recipient countries. This entails that the total flow of remittances to Sub-Saharan African countries is substantially larger than

what official figures alone – that have nevertheless been increasing over the past 30 years (Goupta *et al.*, 2007) - would suggest; the wedge between official and actual figures is likely to be even larger for rural areas in Sub-Saharan Africa, as they mostly come from migrants who move domestically or intra-regionally due to the lower migration costs (Sander and Maimbo, 2005). The growing relevance of remittances as an income source is a sign of the increasing importance of migration as a livelihood strategy that households can resort to in developing countries' rural areas.

This dissertation is meant to contribute to the debate on income diversification and on the role of incomes sources other than agriculture in rural areas, in an attempt to explore some of its most relevant facets in the context of Northern Ghana, an area characterized – according to the literature - by a growing process of income diversification.
The Ghanaian economy has been steadily growing since it implemented the *Economic Recovery Program* in 1983, and it achieved a reduction in the incidence of income poverty; nonetheless, the country is characterized by a great deal of spatial inequality, and income disparities across the North-South divide represent a major concern for Ghana.
Northern Ghana, the focus area of this dissertation, is sparsely populated, it has a poorer endowment of natural resources, it is entirely covered by the savannah, and its per capita gross domestic product falls well short of the national average. This part of the country has been influenced by some key economic processes and institutional changes that took place in the 1990s.
A process of administrative decentralization was implemented in this decade with the purpose to delegate more power to the local governments, and - with the began of structural adjustment policies - the country opened up to international trade, something that proved not to be beneficial for Northern Ghana. In fact, the region suffered from the increased competition by foreign producers, despite the limited degree of integration in international markets that prevailed at that time, and that still prevails. Specifically, subsidies to cotton production provided by European countries damaged local producers and imported rice, poultry and tomato paste induced a significant decline in the demand for the corresponding domestic products.
Moreover, the projects – began in early 1970s – that were successfully promoting the economic resources of Northern Ghana were broken up for fiscal reasons, and the region was neglected in the design of the new economic polices. The detrimental effects of the economic adjustment were just partly offset by the substantial aid flows towards this region.
Last but not least, a progressive change in climatic conditions negatively affected the agricultural sector: today the rainy season begins later than before, and rainfall variability has been increasing, with drought periods even at that time of the year. This means that farmers are exposed to higher risk of crop failure, crop yields reduction and livestock losses due to water shortage.
No wonder that these institutional, economic and environmental changes affected the livelihood strategies of rural households, whose main source of income was their own agricultural production. Although agriculture still represents the prevailing economic activity, survey data show an increasing diversification into non farm activities and migration, consistently with the theoretical prediction of the literature (GSS, 2005; Yaro, 2006; Yeboah, 2005; Obeng, 2005).
The processes of change that are occurring in Northern Ghana – that seem to bring about increasing difficulties in the agricultural sector - make the region an interesting case study in order to analyze the dynamics between the agricultural and non agricultural sectors. The livelihood strategies of rural population in Northern Ghana and the role of income diversification in the region, are in fact the main study objects of our work. The research objective of this dissertation can be further detailed in the following list of specific research questions:

1. How have economic, institutional and environmental contexts been evolving over the last two decades in rural Northern Ghana?
2. What is people's perception of these changes and what effects have these processes had on the livelihood strategies of rural households?
3. Has income diversification actually increased, and which factors have eventually driven its increase?

4. What are the connections between income diversification, poverty and income inequality?
5. Which are the relationships between alternative household strategies as farming, non agricultural activities and migration?

We chose to adopt a variety of methodologies, ranging from qualitative to econometric analysis, to address this broad set of research questions from different perspectives that can contribute to enrich the picture of interest. We carried out a field study in eight rural communities to gather people's perceptions about the changes that have been occurring in the rural areas of Northern Ghana, and of their impact on the well-being of the communities. We realized gender-specific focus group discussions within each community, and some semi-structured interviews with local key informers. In this part of the research, we draw from the *Sustainable Livelihood Approach*, which allows to intertwine a number of usually self-contained and hardly communicating disciplinary fields related to rural development; we attempted to jointly analyze household coping and risk-management strategies, non farm activities, migration and poverty.
The core component of the empirical part of the dissertation is the set-up and estimation of a multinomial logistic model on the determinants of household income diversification, where we drew the data from two distinct rounds of the *Ghana Living Standard Survey*. Households were classified into four mutually exclusive groups, defined according to their income sources: income from agricultural activities alone, income from both agricultural and non agricultural activities, income from agricultural activities and remittances, and all the three sources of income. A major methodological innovation of this part of the dissertation is the inclusion in the multivariate analysis of key community-level variables drawn from the community questionnaires of the survey, that we were able to link to household-level variables, data deficiencies notwithstanding. These variables played a major role in explaining which factors drive household income diversification choices.

The dissertation is structured as follows: in chapter 2 we briefly review the literature on livelihood strategies and income diversification, showing how the relationships among the different kinds of activities are complex, and hard to disentangle, providing support to the choice to focus on a rather homogenous geographical area. We try to highlight the merits of an analytical approach that jointly analyzes all the possible income generating activities, as a narrow focus on just one of them would produce biased evidence. The relevance we attribute to the context and to the specificities of the study area led us to dedicate chapter 3 to an introduction to Ghana, its history and to the roots of the persistent inequality between the North and the South of the country. The chapter also describes the salient features of the Ghanaian economy, with particular reference to Northern Ghana. The field study is presented in chapter 4; we first discuss the methodology we followed to choose the sample communities, that is based on a previous study by the *World Food Program*, that is further validated through a cluster analysis on district level data. We then extensively review the main findings that emerged from the focus group discussions, and the ensuing implications for the rest of the research. The analysis of income diversification based on household-level data is reported in chapter 5, where we first describe the data sources and the methodological issues, and we then introduce a logistic model on the determinants of household poverty status, to gain some understanding about the links between household characteristics and poverty. We also present an analysis of the contribution of the various income sources to overall income inequality, and we then move to the core of this chapter that is represented by the multinomial logistic model on household income diversification strategies. Chapter 6 finally draws the main conclusions of this dissertation.

2. Theoretical background

2.1. The Sustainable Livelihood Approach

The Sustainable Livelihood Approach - that draws on the writings by Robert Chambers - represents a relevant theoretical framework for the analysis of a rural context. This framework allows to disentangle the complex array of factors that shapes the choice of the livelihoods strategies and how they evolve and adjust over time, highlighting their underlying determinants and the role of contextual elements as public policies and institutional, economic and social processes.
The concept of sustainable livelihood security was first introduced in a report of an *Advisory Panel of the World Commission on Environment and Development* (WCED) released in 1987; Chambers and Conway (1991) modified the initial definition contained in the WCED, arguing that:

> "a livelihood comprises the capabilities, assets and activities required for a means of living: a livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation" (Chambers and Conway, 1991, p.i)

The definition of livelihood proposed by Robert Chambers is closely intertwined with the three fundamental concepts of capability, equity and sustainability that represent both the ends and the means of a livelihood. Reardon and Barret (2000) suggest that the livelihood process can be thought as a *production technology*, that employs assets as its factors of production.
As Scoones (1998) argues, the central question that any analysis that relies on the sustainable rural livelihoods strategies framework should address is:

> "given a particular context (of policy settings, politics, history, agro-ecology and socio-economic conditions) what combination of livelihood resources (different types of capital) results in the ability to follow what combination of livelihood strategies (agricultural intensification/extensification, livelihood diversification and migration) with what outcomes?" (Scoones, 1998, p.3)

This theoretical framework can accommodate different units of analysis, ranging from an individual or a household – defined as a unit of residence, consumption and production – to a whole local community or to an even broader group of households. Most of the literature adopts the household – and to a lesser extent, communities - as the relevant unit of analysis. And we will do the same in this study[1]. Figure 2.1 – adapted from Scoones (1998) and Carney (1998) - provides a synthetic representation of all the basic elements of the framework; five key elements can be identified: the context in which people act, the resources they have at their command, the institutions that mediate the access to these resources, the range of activities and choices that people can undertake, and their goals. We provide a brief description of each of these five building elements:

◊ The context
Livelihoods are influenced by external contextual factors, that can be sub-divided into two broad groups – trends and shocks – that differ with respect to the pattern of their evolution over time. There is a rich set of exogenous factors that renders the rural population vulnerable; these range from natural, economic and health shocks to the pronounced seasonal pattern of prices, production and job opportunities. Vulnerability - that can be defined as the probability of entering

[1] We are aware that this choice suffers from well-known limits: such an approach implicitly relies on a theoretical unitary model, where the household is regarded as a unique decision unit that aims at maximizing a single object function, stemming from its members' homogeneous preferences; this entails an apparent neglect of how the distinct roles of its members - who have different preferences and an uneven power - and their interactions influence the control, distribution and use of the household resources (Bourguignon and Chiappori, 1992).

into a path leading to social exclusion or in an emergency condition – can be actually regarded as the distinctive trait of the lives of the rural poor (see, *inter alia*, Calvo and Dercon, 2005).

Figure 2.1. Rural Livelihood Framework

Context	Assets - Resources	Mediators	Resulting livelihood strategies	Livelihood objectives
Trends population, climate, technology, terms of trade, macro policies, national economic trends, world economic trends **Shocks** droughts, floods, pests, diseases, civil wars, prices	natural, physical, financial, human and social capital	Institutions and Organizations	Agricultural choices Diversification in non farm activities Migration	Improving or Maintaining own Well being (e.g. increasing income, reduction in vulnerability, improvement in food security, expansion of the set of capabilities)

Source: adapted from Scoones (1998) and Carney (1998)

◊ The resources

Five types of capital have been identified in the framework to describe the set of resources that people can dispose of to achieve their objectives, and individuals who retain control over a wider set of capabilities have a better possibility to cope with adverse external initial conditions or with unexpected shocks. The dimension of the set of capabilities can be represented by a pentagon (figure 2.2), where is possible to provide a graphic representation of people's endowments[2]. The centre point of the pentagon represent no access to any type of capital and the perimeter represent maximum access to all the types of assets (DFID, 2001).

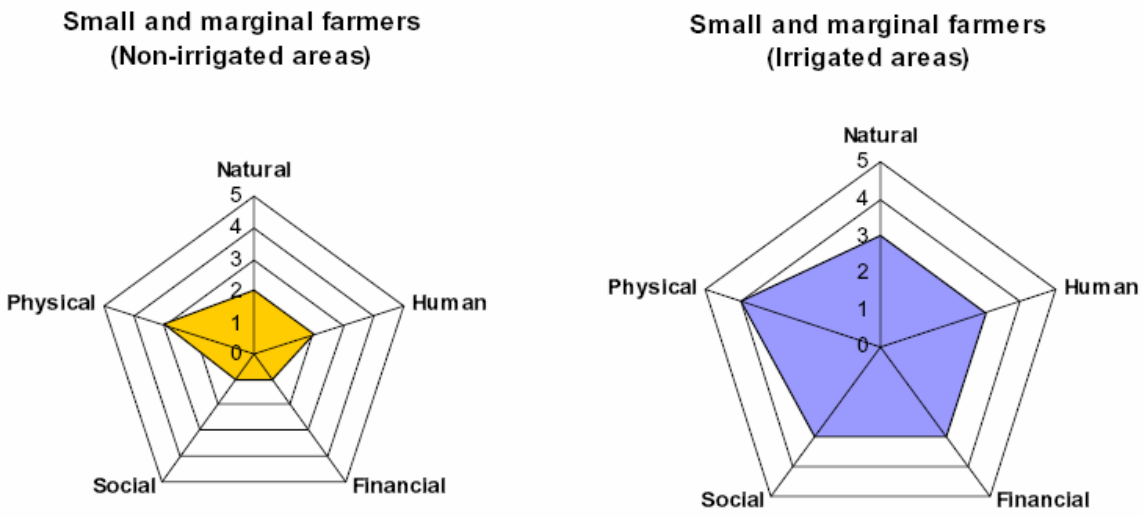
Natural capital includes all the natural resources that are valuable to people as means of survival: the relationship between natural capital and livelihood is particularly important in rural areas because most of the shocks that hit people are caused by damages suffered by their natural assets, like a fire destroying the vegetation or a drought reducing land fertility.

Physical capital comprises the infrastructures and capital goods people can have access to (DFID, 2001), while we define financial capital as the stock of liquid assets people can access. While savings and loans are the most common kind of financial capital, also livestock can be considered a relevant store of wealth in rural Sub-Saharan Africa.

Human capital is the labor force people can employ: it is influenced by the education, skills and by the health status enjoyed by the individuals (Carney, 1998). No universally agreed definition of social capital can be found in the literature; it refers to the resources drawn by the network of relations individuals are embedded in. Moser (1998) defines social capital as the "reciprocity within communities and between households based on trust derived from social ties" (p.4). The relevance of this - admittedly fuzzy - concept of capital in the rural context of Sub-Saharan Africa can be hardly overemphasized: household decisions do not simply reflect the availability of private assets, but are heavily influenced by those resources that pertain to the community. An atomistic perspective could produce misleading conclusions, as the household does not have to be artificially removed from the complex net of relationships with its community (Shaffer *et al.*, 1996; Goldstein *et al.*, 2002).

[2] In this example – provided by Ellis (2000) – just a few measurable assets are used. In this case, households size, access to electricity, educational level of the household head, the number of milk cattle owned and the total area of land owned are represented in the pentagon for each income groups. The figure offers a graphical example of how differences in the access to the five types of capital map into the shapes of the pentagon.

Figure 2.2. Household assets profiles, by income group



Source: Ellis, 2000

◊ The mediators

Resource availability to each individual is deeply shaped and mediated by the prevailing institutions and forms of organization, that condition the access to communal resources, the terms of exchange between different types of assets and the returns from investing on them (DFID, 2001). Therefore, the analysis of the range of formal and informal organizational and institutional factors that influence sustainable livelihood outcomes is a central aspect of this theoretical framework.

◊ The strategies

With the term 'livelihood strategy' we refer to the array and combination of choices and activities that people implement in order to achieve their own objectives. In line with Scoones (1998), we identify three directions along which households can move to choose the combination of strategies that better suit their proposed objectives, given the available resources: farming activities, non farming activities and migration. Within each direction, a household is confronted with further choices (e.g. it has to choose the kinds of crops and farming techniques to adopt, the degree of diversification in income sources, and whether or not to have one or more members who seasonally, temporarily or permanently migrate).

◊ The objectives and the outcomes

All the subjects aim at achieving a common basic objective, that is to maintain or to improve their well-being. Specific objectives - as raising income, reducing vulnerability or improving food security - can be identified according to one's own desires and necessities.

It is important to distinguish between objectives of the livelihood strategies and the intentional and non intentional effects they give rise to. A strategy can have either positive or negative consequences on the livelihood security of the subject who has been embarked in the strategy, or on that of other subjects. Moreover, it can produce feedback effects on some of the contextual factors, as the environment. Therefore, a successful livelihood strategy needs not only to achieve the proposed goals, but it also needs to be 'sustainable'. Sustainability represents an elusive concept, but as a first approximation we can regard strategies as sustainable when they allow to cope with shocks, they are not excessively dependent on an external support, they do not erode over time productive resources, they do not impinge on the subsistence chances of other actors (DFID, 2001) and they are not harmful for the environment. Poverty can be defined as a poor

livelihood outcome. The reasons explaining why the strategy is not good can be more than one: the set of assets can be limited or improperly balanced, the livelihoods options have been combined in a unsustainable way or a poor institutional environment prevented a full exploitation of available assets (IFAD, 2002).

2.2. Diversification in a livelihood context

Ellis (2000, p.15) defines rural livelihood diversification as "the process by which rural households construct an increasingly diverse portfolio of activities and assets in order to survive and to improve their standard of living", so that an household is diversifying when its income comes from a variety of sources.
The diversification process in the rural context has often been interpreted as coinciding with the reduction of farm activities in favor of non farm activities: the expression 'highly diversified rural household' typically refers to a situation where farming activities represent a small and declining share of the overall portfolio of household income-generating activities (Ellis, 2000). Still, a strict reliance to this definition of diversification would require the use of the more specific term *off-farm* diversification to indicate this process. Nevertheless, diversification in agriculture - *on-farm* diversification - is also an important strategy that rural households can adopt, and it should not be overlooked: an intensification or extensification of the use of the land, the cultivation of new varieties of crops, the use of a better technology in farming, the use of different cultivation practices, are all possible ways that people can choose to maintain or to improve their well-being. We argue that, for sake of expositional clarity, one should not confound these two kinds of diversification strategies - off farm and on-farm respectively -, nor one should equate diversification with the reduction of farming activities.
It is then sensible to regard diversification in the rural areas of a low-income country as a process where the households and communities increasingly move away from traditional agriculture towards different ways to earn a living. Besides improvements in farming activities, we consider the involvement in local non farm activities and migration as an exhaustive description of the possible livelihood strategies that people can choose. We will employ the term off-farm diversification when referring jointly to both migration and local non farm activities.

With respect to the figures, the share of households living in rural areas engaged in both agricultural and non farm activities over the world is estimated to range between 30 and 50 percent (Reardon, 2006). Islam (1997) argues that between 20 to 50 percent of rural employment is in non farm activities.
Davis *et al.* (2007) analyze rural income generating activities using the recent RIGA database, that contains comparable data on incomes from World Bank surveys conducted in a vast sample of developing countries[3]. These data suggest that the share of total income from off-farm activities – that include all the non agricultural activities and wage agricultural labour – stands above 50 percent in the majority of countries. If agricultural wage is excluded from the relevant definition, the values range between 20 and 75 percent, with an average value of 47 percent. African countries show a lower share. Transfers (both public and private) account for at least 20 percent of household income in all countries covered by the RIGA surveys, with the only exception of Nigeria. If we look at the participation rate in activities different from farming, it is at least 40 percent in almost all countries.
Reardon *et al.* (2006) note that income from non farm activities generally exceeds both the wage from farm labour and the value of remittances - with a few exceptions, as Ecuador and the Philippines where international migration is particularly important -, and this by far the case of African households. The share of remittances in household income is generally higher in the poorest areas than in the dynamic rural regions.
Regarding the typologies of non farm activities, Reardon *et al.* (2006) observe that wage income is often more important than self-employment earnings. Still, wage income is extremely correlated with higher incomes and with the presence of well-developed infrastructures, so that it

[3] The countries included in their analysis are: Albania, Bulgaria, Ghana, Madagascar, Malawi, Nigeria, Ecuador, Guatemala, Nicaragua, Panama, Bangladesh, Indonesia, Nepal, Pakistan and Vietnam.

is more relevant near the major towns than in remote areas. The service sector is often more important than rural manufacturing, except in the poorest areas where household-based manufacturing is prevailing.

Migration is just one among the possible strategies that households can resort to in order to diversify their incomes, so that migration decisions should not be analyzed in isolation.
Neo-classical economic theory depicts migration as the outcome of a decision process of utility-maximizing individuals: an individual decides to migrate if his expected wage at destination - discounted for both out-of-pocket and indirect (e.g. the risk of an initial spell of unemployment) costs of migration - is higher than his current local wage (see, *inter alia*, Lucas, 1997). Such a representation of migration decisions entails that better educated and more talented individuals should have a stronger incentive to migrate, since most theoretical models assume that returns to human capital are higher at destination (see, *inter alia*, Stark and Wang, 2002). This entails that migration is seen as a self-selective process, which favours the individuals that enjoy a better endowment of human capital (Waddington and Sabates-Wheeler, 2003)[4].
Conversely, the New Economics of Labor Migration literature (e.g. Taylor, 1999) models the migration of a member as the outcome as a collective decision, that often involves not only the household but also the extended family. Migrant and the other members stipulate a sort of implicit contract (e.g. Poirine, 1997), where remittances represent the way to pay back the other household or family members for the resources they provided to finance migration costs.
We maintain that - although the New Economics of Labor Migration marks an improvement upon earlier, and narrower, theories - this approach remains partial. We thus fully endorse the claim by Mc Dowell and de Haan (1997, p.20) when they argue that "there is much to gain from seeing migration as one of the livelihood strategies of households rather than isolating migration events". A scope of this research is to adopt an approach that incorporates this interpretation of migration decisions, both in the qualitative and in the quantitative analyses. Although some empirical papers have already attempted to move in this direction (see, for example, De Janvry and Sadoulet, 2001), we argue that much more work is needed in this direction. The livelihood approach is useful in this respect, as it explicitly considers all the different income strategies jointly, as the outcomes of the interactions between households' assets and the relevant institutional environment.

2.3. The determinants and the effects of income diversification

Here, we'll schematically present the main possible determinants and effects of income diversification choice.

2.3.1. Determinants of income diversification

Reardon *et al.* (2006) decompose the diversification choice in five interdependent and simultaneous choices. Each household has to choose: to participate or not in non farm activities, the sector and the intensity of non farm activity, the location of its activities (locally or elsewhere) and the form of the non farm activity (self- or wage employment). These choices are made on the basis of a wide set of factors.
The underlying determinants of non farm diversification include both pull and push factors.
With respect to the pull factors, we can observe that rural development and a general increase in wealth stimulates the consumption of non farm goods and investments in new economic activities, as economic growth creates a wedge between the expected returns from farming and out farm activities. Improvements in infrastructure, urban growth and an increasing population density represent other pull factors.

[4] According to traditional economic theory, at a macro level migration selection equation are modeled as a function of: variables determining the probability to find a work (for example the education level or the level of unemployment), cost of migration and relative wages between source and destination (Waddington and Sabates-Weeler, 2003)

With respect to push factors, Alderman and Paxson (1994) propose a useful distinction between risk management strategies and risk coping strategies, with the former ones being adopted in order to smooth incomes over time, and the latter being resorted upon after an adverse shock.

◊ Risk management strategies
Non farm diversification can represent a household coping strategy in the face of extensive market failures. The lack of well-functioning asset markets often prevents households that are not endowed with profit-maximizing proportion of assets to farm their land efficiently, and it thus pushes some of its members out of the plot of land. The absence of insurance markets severely constraints the options to achieve protection from income fluctuations, and it induces households to achieve self-insurance through diversification in activities whose returns are weakly correlated. Non farm activities also represent a mean to overcome liquidity constraints that arise because of missing credit markets: they represent sources of cash for subsistence farmers who have to cover substantial expenditures - e.g. inputs for farming, consumption goods, medicines, school fees (Reardon and Barret, 2000).
Migration is another possible risk management strategy for the household. A migrant and its household share an implicit co-insurance agreement: the household initially provides financial support to the migrant member, and it gives him guarantees against eventual adverse income shocks in the initial phases of migration; the migrant – once he has settled at destination – offers in return to his household insurance against unforeseen income shocks at home. Examples of this dynamic are offered by Schrider and Knerr (2000) for Cameroon and by Gubert (2002) for the Dominican Republic.
Sending an household member elsewhere - either in a different rural area where there is a different seasonal pattern or in an urban area - is a routine response to seasonality-induced difficulties (Ellis, 2003). Seasonality is one of the most common push determinants of non farm diversification, as it determines the need for consumption smoothing.
Gebre (1994) describes the process of *twin cultivation* as a response to a similar problem: in some overcrowded zones of southern Ethiopia, where there is a land shortage and depletion, the household plot of land is not sufficient to satisfy food necessities. So, young men often opt for circular rural-to-rural migration. In fact, they migrate in the neighbour areas in search for land to cultivate and return at certain intervals to rejoin women in taking care of the crops they left behind. As we will see in chapter 3, we found a similar dynamic in an area of Northern Ghana.

◊ Risk coping strategies
Non farm diversification can be a risk reduction strategy that households undertake in order to cope with climatic, epidemiological and market variability. The increasing involvement in non farm diversification is often due to diminishing returns to labour or land or to external shocks that affect the household or the community.
Concerning this, Dercon (2002) makes a useful distinction between idiosyncratic risk factors and common risk factors: the former are "aggregate, economy-wide, covariate risks that affect all members of a community or region" (p.142), like a drought or an epidemic. The latter are individual - or household-specific - risks, like a sudden death or a major illness. This differentiation is important to comprehend how to deal with the consequences of each kind of shock. Common shocks can not be insured within a community, since, if everyone is affected, risk can not be shared.
Common shocks generally do not affect all the households symmetrically, as the ones that are better able to manage their assets can easily manage to overcome the shock-induced hardships through a decumulation of their assets, while the poorest are lesser able to cope with analogous situations.
Reardon *et al.* (1998) found that risk-induced diversification is most diffuse in the agro-ecological regions - like dry land areas - where climatic shocks are most likely to occur and to be severe. The better the agro-climatic conditions, the lower is the share of income from non farm activities and migration on total income.
On the other hand, households with a limited access to environmental capital or living in risky natural environments may have limited access to livelihood strategies alternative to farming.

Similarly, those living in remote communities face higher travel costs and can access to less dense social networks in their destination areas (Weddington and Wheeler, 2003).
Asset composition, that includes both private assets (i.e. human capital, livestock, land) and public assets (i.e. schools, markets, water), is fundamental in determining the ability to adopt risk coping strategies[5].

2.3.2. Effects of income diversification

It is not easy to identify all the possible effects of income diversification. Here, we try to review some of the effects the literature generally considers: the interactions among economic activities, the effects on food security, on farm productivity and on the environment.

◊ 'Crossed' effects: interactions among activities
The interactions among different livelihood strategies are very tight, and *a priori* it might be hard to figure out whether the engagement in a certain activity is either detrimental or beneficial for the possibility of pursuing an alternative income-generating activity.
FAO (1998) identifies three stages of transformation of a rural economy; initially, the production and consumption linkages between the agricultural and the non agricultural sector are strong. The second stage is characterized by a decline in the share of households that exclusively depend on farming activities, and there are more connections between rural and urban labour markets, and the rural manufactures are negatively affected by the competition of imported goods. At the third stage, there is a massive migration from rural to urban areas and strong employment generation in sectors unrelated to agriculture.[6]
This taxonomy of rural development bears some similarities with the 'stages of diversification' elaborated by Reardon *at al.* (2006): the first step is constituted by the diversification in the self-employment manufactures, the second is constituted by diversification in the wage employment in manufactures, then there is the diversification in self-employment in services and finally in the wage employment in services.
We argue that the interactions among the different activities are more complex, as Mc Dowell and de Haan (1997) evidences with respect to migration:

> "we know very little about the linkages between migration and other household's livelihood strategies, particularly intensification and diversification. Agricultural intensification generally requires increased labour. Migration may, therefore, place a restriction on intensification. Livelihood diversification strategies may benefit, not from the absence of labour necessarily, but from the opportunity that a migrant established elsewhere may provide, as for example, an outlet for non far produces or services" (Mc Dowell and de Haan, 1997, p. 19).

Theorizing the existence of a 'stage hypothesis' applicable to every rural context clearly errs on the side of over-simplification[7]. To pin down ideas, the relationship between farming and non farming activities is not so direct as the stage models entail. Although it is true that non farm activities can be an important source of income in times of hardships in the farming sector, it is nevertheless common to observe that non farm income is often covariant with that from agriculture in the areas where farming is the major income generating activity. This means that when the harvest is poor, there may be fewer opportunities for non farm earnings (Reardon, 2006).
Furthermore, non farm income can allow to undertake investments in agriculture; conversely, some studies tried to estimate the impact of additional agricultural income on non-farm incomes, concluding that a more dynamic agricultural sector tend to be associated with more non farm activities because it gives rise to 'non farm multipliers' (Gordon and Craig, 2001).

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[5] We will analyze in depth the relationship between specific assets and activities in Chapter 5, where we will examine the determinants of household diversification in Northern Ghana through a multinomial logit model.
[6] According to Gordon and Craig (2001), Sub-Saharan Africa and South Asia can be placed in the first stage of this transformation process, while Latin America has already achieved the second stage and East Asia the third one.
[7] It is possible to ascribe to these theories the same critiques as the theory of the Stages of Economic Growth by Rostow (1960).

Reardon *et al.* (1998) evidence some of the channels through which agricultural income stimulates non farm activities: the profitability of processing crops depends on the price of raw material, the composition of agricultural output affects the potential for related non farm activities and additionally a marketing surplus exists only when crop yields and volumes are abundant. The non farm multipliers appear to be lower in African than in Asian countries, probably because the farming sector is smaller.
This effect is a demonstration of the relevance of the 'agriculture as the engine of growth' models; according to these models, policies to promote agriculture have a 'knock-on' effect on the non farm economy.[8]
The New Economics of Labour Migration recently focuses on the effects of household migration strategies on household labour allocation to non farm activities and farming. Taylor *et al.* (2003) provide evidence for China that when a member of the household migrates, the household labour force involved in farm activities is reduced while this does not occur to local self-employment, since these are perceived as high return activities. Conversely, Matshe and Young (2004) found that households in rural Zimbabwe that are able to migrate prefer not to undertake non farm activities because of their lower returns.

◇ Effects on food security
The effects of off farm diversification upon food security can be ambiguous, at least in the long run. In the short period, it allows to generate cash earnings that are useful to purchase food when the harvest is meagre, or during the dry season. According to Devereux (1993), migration of a household member reduces the number of people to be fed in the peak food deficit season, so it has a positive impact on food security. In the long run, the effects on food security are strongly related to the impact of off farm diversification on agriculture; this impact varies across regions, it is sensitive to the context, and it is closely intertwined with the underlying determinants of off farm diversification itself.

◇ Effects on farm productivity
Off farm activities are generally performed by those members that are not required in farm operations or during the slack season, so that their removal from agricultural activities does not have a significant negative effect on yield and on food security.
But the effects become uncertain in the long run; Lipton (1977,1980) finds that distant migration depletes physical labour capacity and farming skills, because typically the younger, better educated and more innovative members migrate. David *et al.* (1995) found that male migration in Burkina Faso overloads women who have to work harder in the compound communal fields, and have less time for their own land. A similar effect is found by Toulmin (1992) in rural Mali.
Nevertheless, if one maintains that the choice to migrate is rational, then the forgone farming income is more than compensated by the income of the migrant, and the well-being of the entire household will generally improve – though possibly with an uneven distribution of the benefits among its members. Furthermore, migrants' remittances can finance agricultural investments and thus be conducive to a rise in farm productivity[9].

◇ Effects on the environment and on land management
The effects of non farm diversification on the environment and on land management are explored by Holden *et al.* (2004), who argue that an improved access to non farm income sources reduces households' incentive to invest in conservation activities, causing more land degradation and soil erosion, even though intensity of production is reduced. Also Jansen *et al.* (2006) state that the type of income earning strategies influence the adoption of conservation practices in rural Honduras.
An interesting approach to analyse the impact of the transformation of the economy on the environment is proposed by Lopez (2003), who observes that, where the labour shift from

[8] More direct policies to stimulate non farm economy are promotion of tourism and manufacturing: Lanjouw and Feder (2000) stress their importance, since they offer good employment opportunities especially to the women.
[9] Example of productive uses of remittances in the agricultural sector are found by Adams (1998) in rural Pakistan and by Taylor and Mora (2006) in rural Mexican households.

agricultural to non agricultural sectors is driven by push factors, we can talk of a 'perverse structural change', that causes environmental degradation, the expansion of informal non agricultural activities and migration, without permitting a country to grow and to struggle against poverty. In such a situation, the development of a non traditional sector is "associated with impoverishment and prompted by a scarcity of natural resources or environmental depletion that affects the rural population" and especially the poor (Ticci, 2007, p. 13).

2.4. Income diversification and poverty

The links between poverty and income diversification are not easy to explore because the causal relationship runs in both directions: poverty is a determinant of livelihood strategies, but at the same time the set of income sources of a household influences its income level. Here, we are particularly interested in exploring the reasons underlying income diversification strategies. The researches on livelihoods suggest that the most successful households have a larger share of income from activities different from farming; Reardon (1997) provides evidence draw from 18 case studies that suggest that the households in the upper income tercile earn from non farm sources a share of total income that is twice as large as the one observed in the lowest tercile.[10] The least affluent households remain in subsistence agriculture or undertake low casual work in other farms (Ellis, 2003). Reardon *et al.* (2006) argue that "that poor households are more likely to get caught in short-run recovery strategies, while rich households profit from diversification to initiate structural improvement strategies" (p.15). There is a variety of hurdles that can hinder poor people from taking part in non farm activities: this range from a poor health status to the lack of adequate training and skills, from the lack of financial capital to cover start-up costs to poor community infrastructures. These factors entail that the poorest households are often relegated to a set of non farm jobs that do not offer them a way out of poverty, and that the promotion of non farm activities may contribute to exacerbate income inequality (Davis *et al.*, 2007). Even resorting to migration could be unfeasible for poor households, as their strong incentive to move is severely constrained by the inadequacy to afford migration costs.
Davis *et al.* (2007) argue that it is useful to distinguish between a non farm sector with a high productivity, and another with low returns, which is used as 'refuge' - e.g. last resort - source of income. Such a distinction entails that it is often unfeasible to determine *a priori* which is the relationship between non farm activities and poverty - as this depends on a wide set of contextual factors; the remark by Davis *et al.* (2007) can contribute to explain why the findings of a large body of literature on this topic are inconclusive or contrasting. While Reardon (1997) suggests a strong positive association between non farming activities and household income, Adams and Alderman (1992) find an opposite result in South Asia, and FAO (1998) shows that in Pakistan and in Kenya the share of non farm activities is highest among the poorest households, while data from Niger, Rwanda, Vietnam and Mozambique are consistent with Reardon (1997). Several case studies from Latin America question the linearity of this relationship, as a U-shaped relationship appears to be prevailing (Reardon *et al.*, 2001).[11]
Multiactivity - or *pluriactivity* - is the term used to label a situation where a household is engaged in more than one income generating activity[12]. According to Ellis (2000) a negative relationship between income and degree of multiactivity is observed in regions where it is land ownership that marks a divide between well-off and poor households. Conversely, a positive relationship emerges where livestock and human capital are the main assets that determine the socio-economic status. Still Ellis (2005), maintains that livelihood diversification generally is beneficial for poverty reduction and to decrease vulnerability; if it fails to do so, this can be traced back to an adverse public sector context.

[10] Lanjouw (1999), Elbers and Lanjouw (2001), Adams (2001) and Isgut (2004) provide similar evidence.
[11] Even the evidence from the recent RIGA surveys is notably mixed: agricultural incomes constitute the most relevant share of total income for the poor in 8 countries, while in 6 countries a U-shaped relationship between farming and income emerges, while in 2 countries - Nepal and Pakistan - farming appears to be more relevant for the wealthier households.
[12] The relationship between multiactivity and poverty clearly differs from the individual- to the household-level: while individuals with a higher income tend to be more specialized, richer households diversify among several activities, with their members specializing in distinct economic activities (Reardon, 2006).

With respect to migration, Waddington and Wheeler (2003) argue that a non-linear - concave - relationship between income and migration emerges from the combined effect of the two underlying determinants of migration: the incentive to move, and the capacity to afford the ensuing costs. Those who face the largest expected return from moving are the least able to afford migration, while those who are not financially constrained have the weakest incentive to move, so that emigration rates tend to be lower in the two tails of the income distribution[13]. Still, the empirical evidence is not fully supportive of this hypothesis, as other studies find monotonic relationships – either positive or negative – between income and the propensity to migrate. Once more, one needs to be wary of endorsing *a priori* a theoretical hypothesis, as contextual elements are likely to shape this relationship. Nevertheless, an important distinction can be made between internal and international migration, since the costs of the latter are much higher, while the former can be afforded even by poor households.

Migration from rural areas is often perceived as a consequence of poverty: studies on Mali and Niger found that seasonal migration is typical of the poorest households (Waddington and Wheeler, 2003). De Haan *et al*. (2002) argue that in Malian villages seasonal migration is typical of the 'middle group' – defined in terms of assets endowment - and that permanent migration is not common among the poorest. De Haan *et al.* (2000) similarly find an inverse relationship between land and livestock ownership and migration, suggesting that the better-off are not likely to migrate; at the same time migration is rare among the households without land. The RIGA dataset evidence that the households that receive public and private transfers are not the wealthiest, although these sources of income are generally regressively or neutrally distributed (Davis *et. al.*, 2007).

Some studies demonstrate that remittances can reduce vulnerability[14]. In fact, migration can be a social security mechanism for poor households. But migration can also cause increased vulnerability for a household if it becomes dependent from the migrant transfers, and sometimes also for the migrant himself. There are a number of studies on the living conditions of migrants, on their poor health, and about the exploitation they often suffer. Migrants' health could be hurted by the hardship and dangers of their working conditions, and by the inadequacy of their shelters (WHO, 2003). The prevalence of the HIV-AIDS among migrants appears to be higher than in the rest of population (Brockerhoof and Biddlecom, 1999). When the migrant is a woman, those left behind - especially the elders and the children - may suffer from a poorer health conditions due to the decrease of care (Ehrenreich and Russel Hochschild, 2002); children left behind by their mothers could suffer from psychological problems (Spencer, 2003).

When remittances become the main source of income, the members of the household who stay behind are extremely vulnerable: some studies evidenced that the women whose husbands have temporally or permanently migrated perceive themselves as more food insecure, and they try to rely on social relations outside the household to keep things going during the absence of the companion[15]. The impact of migration on vulnerability is likely to depend on the typology of migration, and on the management of the remittances.

Poorer migrants use to send home a larger percentage of their income; Black *et al.* (2003) argue that a sort of inverted-U relationship prevails, as the share of income remitted at first increases with migrants' income, while it later declines. The willingness to improve the household status represents an important incentive to remit a large part of income; such an improvement often entails the construction of new houses, or the ritual expenditures for weddings and funerals (see, *inter alia*, Ballard, 2003 and Osella and Osella, 2003).

Deshingkar and Start (2003) make an interesting differentiation between migration as a coping or accumulative strategy. Remittances can be considered as an accumulative strategy when they mostly contribute to household savings. The household can decide to save money for various reasons: for example to invest in agriculture (i.e. investments in land, purchase of inputs to agriculture, investments in machines for agriculture), in assets contributing to the generation of

[13] Waddington and Wheeler (2003) quote a number of studies that confirm the existence of such a concave relationship, as Banerjee and Kanbur (1981) for India and Adams (1993) for Egypt.

[14] See for example Lucas and Stack (1985) for Tanzania; Cox *et al.* (1998) for Peru; Gubert (2000) for Mali.

[15] Some interesting studies on these dynamics are Khan *et al*. (2003) for rural Bangladesh, Rogaly and Rafique (2003) for India, and de Haan (2000a) for Mali.

non farm income, or in the education of the younger (Ellis, 2003). If the investment is profitable, it could help the household to get out of poverty[16]. When remittances are mostly used to supply the basic needs of the household – it is extremely common for the poor – we can consider migration a coping strategy that it is unlikely to improve the household socioeconomic status in the long run.

2.5. Income diversification and inequality

Non farm activities often have an higher return than farming, and they are accessible only to households with a wider set of assets (see chapter 5). Thus, we could assume a positive relationship between non farm activities and inequality. Reardon *et al.* (2000) argue that non farm employment reduces inequality only if three empirical features are met: the income generated from these activities is large enough to influence the income distribution in rural areas, non farm income is unequally distributed, and this unequally distributed income source favours the poor (Reardon *et al.*, 2000). But there is evidence that none of the non farm employment sources necessarily reduces inequality in rural areas.

The empirical evidence is not homogeneous, and it is strictly dependent on the access to different assets. Adams (2001) argues that income from non farm activities contributes to increase inequality when land is available but labour is scarce; conversely, when land is scarce but labour is abundant, these activities contribute to reduce inequality.

Lanjouw and Feder (2000) observe that off farm employment can reduce inequality as it offers a source of income for those households who are not able to benefit from agriculture.

Conversely, the analysis on the RIGA dataset shows that non farm income sources are always associated with an increasing inequality: using the Theil index, Davis *et al.* (2007) demonstrate that almost invariably non farm income sources increase total income inequality is positive, and in most countries the size of this effect is large.

There is also evidence of a U-shaped relationship indicating that non farm activities are important in the two tails of the income distribution: this suggests the net division between low- and high-yielding non farm activities (Gordon and Craig, 2001). Adams and He (1995) find that unskilled non farm rural labour reduces inequality in Pakistan, while self employment and government employment are not accessible for the poor.

Migration increases inequality when the poorest are not able to afford migration costs, and this is apparent in the case of international migration (De Haan and Rogaly, 2002), while it is not easy to identify a precise relationship when we consider internal migration. This is closely intertwined with the determinants of the choice to migrate; if barriers to internal migration are low and the migration strategy is predominantly profitable, this has the potential to help the poorest households to get out of poverty (Waddington, 2003).

Stark (1991) finds that remittances reduce income inequality in the rural Mexican villages. This result is criticized by Barham and Boucher (1998): they observe that Stark does not account for the income that migrant members whould have generated, had they remained at home. They find the opposite result for Nicaragua, estimating a counterfactual income scenario for a sample of households with migrants.

2.6. Some peculiarities of livelihood diversification in Sub-Saharan Africa

Livelihood strategies are context-specific and vary across geographical areas. Heyer (1996) argues that the Sub-Saharan rural system presents distinctive traits from other rural systems. According to Heyer (1996), the rural population in Sub-Saharan Africa has developed several peculiar strategies to mitigate the adverse consequences of the risks they are exposed to. The diversification of income sources, migration and the desegregation of familiar groups, the formation of extended families to achieve risk-sharing represent widespread behaviors. Individuals are often engaged in activities that do not typically pertain to the rural sector (e.g.

[16] Case studies that illustrate how the investment of remittances can help to reduce poverty are found in Deb et *al.* (2001), Deshington and Start (2003), Ammassari and Black (2001).

trade, transport, manufacturing, building, mining), and the same farming activity is usually extremely diversified, with close connections with the rest of the economy.
As Reardon and Barret (2000) argue, diversification is the norm in rural Africa, where very few people have only one income source. The DARE[17] survey evidences that the majority of the households have one or more non agricultural income sources; only a minority relies on agriculture alone (Bryceson , 2000). The degree of multiactivity in Africa is higher than in other developing areas; this can be partly explained by the long dry season that characterizes most of the Sub-Saharan African countries and induces people to search for alternative sources of income, since farming and non farm activities are often counter-cyclical (Reardon *et al.*, 2006).
Ellis (2005) argues that the extent of diversification out of agriculture in Sub-Saharan Africa indicates that farming can not provide a secure livelihood. Households have various diversification options to maintain their consumption levels, ranging from the search for additional income sources to asset decumulation, although this generally represents an option of last resort. Both Reardon *et al.* (1992) and Barret and Arcese (1998) - who examine the effect of a drought in Burkina Faso and the agro-climatic changes in Tanzania respectively - find that the ability to cope with shocks is strongly associated with the extent of the household pattern of non farm diversification.
Diversification into non farm activities in Africa, measured by the share of non farm income in rural household income, amounts on average to approximately 45 percent (Reardon and Barret, 2000; Ellis and Freeman, 2004) and it is greater than in other low income countries. Reardon and Barret (2000) argue that diversification is accelerating in rural Africa because of the presence of both pull and push factors: income is growing, the access to global markets is increasing, infrastructures are improving and, at the same time, the risk factors have not fallen.
Income diversification in Africa includes agricultural diversification, but its non agricultural component is more prominent and migration is an important type of non agricultural diversification (Bryceson, 2000). Rural non farm activities in Africa are mostly informal and they are often linked with local agriculture (Reardon, 1997). The most common non farm activities in Sub-Saharan countries are beer brewing, fish processing, oil processing, pottery, rice husking, groundnut shelling processing and sale of food, crochet and other similar little activities.
Non farm income diversification seems to have a largely regressive distributional impact in African countries, more so than in other low and middle income countries. This can be attributed to the specific features of the African rural markets, where the barriers to entry (e.g. transport or credit constraint) are too high for the poor (Reardon, 1997).
The LADDER[18] project confirmed the strong relationship between per capita income and the share of non farm income. In Tanzania, for example, where a sample of 344 households has been interviewed, the share of agriculture in the household income is 67.7 percent for the first quartile and 42.6 percent for the top quartile (Ellis and Mdoe, 2003). An additional finding of the LADDER project research is that farm and non farm activities seems to be interdependent: the higher yields per hectare are registered for those households who are less dependent on farming, who tend to be the most affluent ones (Ellis, 2005).
As Ellis (2005) argues, also in Africa there is a difference between better-off and poor households with respect to the kind of diversification: the former tend to diversify in non farm business activities or salaried employment, the latter are generally engaged in casual wage work, especially in other farms. Most of the practiced activities do not require a big initial investment, so that the entry and exit barriers are quite low, and shifting from one activity to another is quite common (Yunusa, 1999, for Nigeria; Mwanfupe, 1998, for Tanzania).
The DARE survey allows to identify a predominant non agricultural income source for the sample countries, that differs across countries, although it mostly serves a common objective, that is meet the basic consumption expenditure of the household: the Ethiopian and the Malawian case studies evidence that the prevailing non agricultural activities are mostly in the service sector that serve a limited local market. The survey suggests that people are more market-responsive and

[17] DARE is the acronym of *De-Agrarianisation and Rural Employment* research program, made up of a network of Africa-based researchers engaged in local-level studies of livelihood practices, funded by the Netherlander Ministry of Foreign Affairs.
[18] LADDER is the acronym of *Livelihoods and Diversification Directions Explored by Research*: it is a program funded by the Policy Research Program of the UK Department for International Development.

trade represents the main non agricultural activity in the sites where there is a tradition of active participation in labour migration and in agricultural commodity production - Tanzanian, Nigerian and Zimbabwean case studies. In South Africa and in additional Zimbabwean case studies, most of the non agricultural earnings come from pensions or remittances (Bryceson, 2002).
The economic transformation goes hand in hand with a social transformation within households and communities: the most important changes emerging from the DARE research are the progressive reduction in size of extended families and the emergence of mononuclear families, the reduced dependency of young and female members on the male household head, as given they have often a personal source of income they retain control of, and the major use of matrilineal ties to guarantee the material security of women.
Even when a substantial proportion of the income comes from non farm sources, farming is still attributed a central role: almost everybody has a small plot of land, that represents a vital safety net as it provides some degree of food security. The agrarian values are still deeply rooted, and there is a limited perception among people of the gradual shift of the economy from agriculture to a combination of agriculture and other non farm activities (Bryceson , 2002).

2.7. Conclusions

This brief review of the literature on livelihood strategies and income diversification showed that the relationships among the different kinds of activities are complex and hard to disentangle, and it is difficult to find common trends over the developing world. The evidence about the relationship between income diversification and poverty - or inequality – is still inconclusive. Even if we focus on Sub-Saharan Africa alone, we do not find univocal paths. This entails that a deep knowledge of the local context is necessary to better understand livelihood strategies and to design policies that can improve the household wellbeing. This is the basic rationale that led us to choose a field study in a homogeneous area of Ghana as the first step of our research project.
Furthermore, we tried to highlight the relevance of an approach that jointly analyzes all possible income generating activities, as it would be limitative – and possibly misleading - to narrow the focus on just one of them.
Finally, going back to the distinction proposed by Dercon (2002) between idiosyncratic and common risks, it has to be stressed that in a rural area where households live in small villages, there are a number of risks - or opportunities - that have to be faced by the entire community, that thus becomes a fundamental unit of analysis for livelihood investigation.

3. The case study area: Northern Ghana

3.1. Introduction

Ghana is one of the most densely populated countries in Western Africa; its population is concentrated in the coastal region and in the largest urban centres (Accra and Kumasi). The gross domestic product has been growing at a steady average rate of 4 percent per year over the last 20 years, and at 5 percent per year between 2000 and 2005 (World Bank, 2006). The recent economic growth can be mainly traced back to the high world prices of gold and cocoa - the two largest export items - and to higher than usual crop yields of cocoa.
Notwithstanding the steady growth of GDP, the structure of the Ghanaian economy has remained almost unchanged since independence in 1957, with an informal sector that is still playing a critical role in the economic system. Farming is the most important economic activity, and - together with fishing and forestry - it represents 40 percent of GDP. The boosting cocoa sector has contributed to increase the relevance of the agricultural sector in the past few years, as Ghana is the second largest world producer of cocoa after Ivory Coast. Notwithstanding the rising price of cocoa, gold has become the largest source of export revenue since the 1990s.
Manufacturing and mining activities account for 25 percent of GDP, but just mining and construction activities show some dynamism, while manufacturing remains stagnant. In rural areas, the processing of agricultural products and fishing represent the main income generating activity that is performed by small informal micro enterprises. The service sector is growing, and tourism has recently replaced wood as the third largest source of foreign currency (IMF, 2005).
Ghana implemented the first structural adjustment plan designed by the *International Monetary Found* (IMF) in 1983, when the macroeconomic conditions of the country were extremely worrisome, as the country was on the verge of an economic collapse. The major reforms that were introduced included slashes to social services and to public employment, devaluation of the domestic currency and removal of all price controls, a widening of the fiscal base and a strengthening of the tax collection system, privatisation of state-owned enterprises, support to traditional export-oriented sectors (e.g. cocoa, mining, wood).
The intervention of the IMF in Ghana can be regarded as successful from a macroeconomic perspective: the growth rate of GDP has rebounded after a stagnant period, inflation was significantly reduced, more foreign direct investments have been attracted in the country, several industries were bailed out and exports have grown substantially. These macroeconomic improvements, however, have matched by controversial impact at the microeconomic level.
Cut backs in public expenditure - and in particular to social system - that were combined with the introduction of user fees for educational and health services and the reduction in the size of the public administration entailed a drastic reduction in the accessibility of public services, most notably in rural areas. The structural reforms exacerbated the socio-economic inequalities along the rural/urban divide and between the central and the remote areas of the country, which was already characterized by large spatial inequalities. Moreover, the devaluation of the domestic currency increased the cost of importing essential goods, public debt soared and Ghana joined the *Heavily Indebted Poor Country* (HIPC) initiative for the reduction of its debt.
Nowadays, after more than 20 years of structural adjustment and despite considerable poverty reduction efforts, Ghana is still classified by the United Nations in the group of low income countries.
The aim of this chapter is to give a complete picture of the salient features of the Ghanaian economy, with particular reference to Northern Ghana and to the causes of the persistent inequality between the North and the South of the country. We decided to give a lot of space to this matter in the thesis, since we believe that a good knowledge of the study area context is essential in order to be able to analyze specific aspects of its economy.
This chapter is structured as follows: in the second paragraph we present an overview of Ghanaian economy in an historical perspective, explaining the reasons of the crisis of the beginning of the 1980s and presenting the main reforms introduced during the structural adjustment experience, with a particular emphasis to the agricultural sector. We point out the winners and the losers of the adjustment policies and what the benefits for the poorest have

been. In the second part of the chapter, we focus specifically on Northern Ghana, making an historical excursus of the North-South divide, and describing the main features of the economy of the area, with a special focus on the more recent trends. The last paragraph concludes.

3.2. An overview of Ghanaian economy in an historical perspective

3.2.1. From independence to the crisis of early '80s

The conditions of the Ghanaian economy before the adoption of adjustment policies were really worrisome: GDP declined by 21.2 percent between 1980 and 1983; the manufacturing index dropped from 100 in 1977 to 63.3 in 1981, with an estimated average capacity utilization at 24 percent; the production of all the main crops fell sharply and the same was for the exportation of cocoa, mineral and timber. In the same way, the total deficit rose by 690 percent between 1975 and 1981 and it was covered by heavy borrowing from the Central Bank. Fiscal deficit and falling of domestic and export production conduced to high level of inflation, so that during the 1970s the cedi (e.g. the Ghanaian currency) was devaluated several times (Hutchful, 2002).
The causes of this deep crisis can be traced back to the management of the economic system since the independence, in 1957. In fact, the two decades following the independence were characterized by the succession of protective measures inspired to the 'Import Substitution Industrialization' theories and more liberal measures, often negotiated with the IMF, aimed at the opening of the economy.

At independence, Ghana was the most important producer and exporter of cocoa of the world and it exported also a large amount of gold. It was endowed with good education and infrastructure systems, if compared with the rest of the Sub-Saharan Africa. Its per capita income was almost high; in fact, it was placed among the middle income countries (Konadu-Agyemang, 2000).
The nation's first republic government, led by Kwame Nkrumah, instituted a policy of free education and health care, initiated mass industrialization and electrification programs and established several State corporations able to compete with private and foreign enterprises. By 1960, Nkrumah had resorted to an autocratic rule, to human right abuses, corruption and mismanagement of public affairs. All this conduced to several antigovernment demonstrations, which led to his overthrow in 1966.
A number of governments and military coups succeeded. Each government applied his own view of the economy, which was often clearly in contrast with the precedent. Therefore, an apparent consensus on several core issues of economic and social policy - like on the leading role of the State and the importance of social welfare investment - emerged, transcending political and class affiliation. Hutchful (2000) defines this broad consensus as 'the fiscal coalition', since it implied a high level of expenses.
After a first period of government of the *National Liberation Council*, that applied a typical package of deflationary fiscal and monetary policies, in 1969 *Progress Party*, under the leadership of Dr Busia, continued on the liberalization and privatization route, but with a larger role of the State[1]. At the beginning of 1972, Dr. Busia was defeated from the military coup of colonel Acheampong, who redefined the policy direction, by revaluating the cedi and by reintroducing a system of control of the state on the economy. He broke with the IMF with a unilateral rescheduling of the public debt.
The new government invested in the agricultural sector, especially in the North. Governmental agencies or parastatal organizations undertook the production, import and distribution of farm inputs such as seeds, fertilizers, insecticides, hand tools, motorized equipment. In 1971 the *Ghana Food Distribution Corporation* (GFDC) was established to provide outlets for farmers located in remote villages[2]. The programs *Operation Feed Yourself* and *Operation Feed Your*

[1] He carried out an expansionary policy, which caused doubling of the deficit between 1969 and 1971 and the devaluation of the cedi by 44 percent to the dollar.
[2] The GFDC bought agricultural products (maize and rice in particular) from farmers for distribution. There was a system of minimum guaranteed prices for rice and maize and producer prices for cocoa, cotton and palm oil were set by the government. The Ghana Cotton Company had the monopoly in buying cotton (Khor, 2006).

Industries were launched and this permitted Ghana to become self sufficient in rice between 1974 and 1975 (Khor and Hormeku, 2006).
Moreover, the government stimulated commercial banks to concede credits to large farmers, but their failure rate were very high and in 1975/76 less than 40 percent of loans advanced by the three leading commercial banks in the northern regions were repaid[3].
As a result of all these factors, the budget deficit increased, as well as the inflation rate, and the parallel market registered an impressive growth. In 1978 there was another palace coup. General Akuffo tried to re-introduce a process of liberalization: the adoption of a flexible exchange rate, another devaluation of the cedi and the agreement with IMF for a series of stabilization measures are the proofs of his intentions. Yet, in June 1979, the *Armed Forces Revolutionary Council* (AFRC), led by Jerry Rawlings, made another military coup. In September of the same year, Dr Hilla Limann was elected as prime minister: he was not too keen on imposing austerity and was sceptical toward the solutions proposed by the IMF. The government, that was remembered as the 'do nothing government', did not remain in office for a long time, as by the end of 1981 the Jerry Rawlings' era started: he ruled Ghana until 1999, and from 1992 as an elected president.

At the beginning of the 1980s, the crisis was revealed by a general impoverishing of the population and by stagflation. Living standards dropped. All the wellbeing indicators worsened. There was a massive emigration, especially toward Nigeria, the more educated being the ones to resort the most to migration. Even doctors and teachers migrated, and the quality of health and education was negatively affected from this. Inflation caused the erosion of the real wages and an increase of the second and third job was registered, in particular in the informal commercial sector (also illegal trade). The Opec crisis and the unfavourable terms of trade of cocoa, timber and gold contributed to the crisis.
In 1983, more than one million Ghanaians were repatriated from Nigeria, because of the oil shock (Sowa, 2003). Another serious drought manifested in 1982/83 and Rawlings was compelled to turn to the West for financial and food aid.

3.2.2. Structural adjustment: the Economic Recovery Program

When Rawlings took power, he was supported from a coalition of popular forces: urban workers, junior civil servants, unions, students, left organizations and defence committees. They had in common the idea that the economic situation of the country could be addressed with a more transparent and rigorous administration and that the attention had to be concentred on the control of money supply, on the fight against *kalabule* - a term that in Ghana indicates illegal buying and selling of officially controlled goods - and against tax evaders.
But very soon Rawlings realized that these 'soft' interventions would not be sufficient. The worsening of the crisis with the oil embargo imposed by Nigeria and the drought, together to the failure of a mission to the Soviet Union aimed to obtain assistance, induced the government to agree with the thesis of the *New Democratic Movement*, whose leader Botchway theorized that the necessary immediate financial reforms were compatible with the scopes of the IMF. In brief, the Ghanaian government intended to use the support of IMF as a temporary and exceptional aid, and went to the negotiation with the intention of contracting every point of the agreement[4].
The coalition that had supported the military coup of Rawlings soon broke: Rawling was very good in manipulating and neutralizing social movements, institutions and his own party, in order to centralize all the power around him. "Thus while the revolution started off with a broad participation base, it ended up with extremely narrowly-based and personalized decision making structures" (Hutchful, 2002, p.50). This centralization of the power could be seen as a strength point of the adjustment in Ghana. Rawlings managed to control the oppositions of the workers

[3] The low rate of repayment can be largely explained with the drought that affected the area, but also, according to the World Bank, with the excessive subsidies that encouraged 'absentee farming' (Hutchful, 2002).
[4] Before the reforms were introduced, there was a debate between monetarists and structuralists on what political economy was better for the country. Structuralists were firmly against the intervention of IMF, since in their vision the problem of Ghana was not the statism, but the existing State, that with a reprehensible behaviour of the administrators made public controls ineffective or damaging. Monetarists advocated for IMF intervention, underlining the exigencies to intervene on inflation and deficit (Hutchful, 2002).

and of the students[5]. The international institutions did not give any weight to these authoritarian behaviours and a massive amount of aid arrived from all over the developed world, especially from Japan (Mensah *et al.,* 2006).
At the beginning of the 1980s, according to IMF, the main constraint to the development of the African countries was the excessive state interference to the market forces. The IMF particularly criticised the price controls, the overvalued currencies, the inward looking trade policy and the heavy government spending (Konadu-Agyemang, 2000). The reform package[6], known in Ghana as the *Economic Recovery Program* (ERP), was designed with "a particularly optimistic view about the efficacy of the market mechanism as a vehicle of promotion of efficiency and development" (Aryeetey and Tarp, 2000). It was not considered that trade and market liberalisation could be ineffective in a context where insurance and credit market did not function (Kraev, 2004).
Tsikata (2001) proposes a division of the Reforms' period in four phases that are well represented in table 3.1.: for each phase, the principal reforms adopted in four areas –prices, fiscal policies, structural policies and institutions - are reported.

Table 3.1. Major phases of Ghana Reforms (1983-2002)

Area of Reform	**Phase I** *Stabilization (1983-86)*	**Phase II** *Adjustment (1986-91*	**Phase III** *Oscillation (1992-96)*	**Phase IV** *Re-stabilization and Adjustment (1997-2002)*
Pricing Reforms	Devaluation of currency; removal of price control; wage restraint; rationalization of energy and utility prices.	Market-based exchange rate; interest rate liberalization; establishment of foreign exchange bureaus.	Automatic price adjustment for petroleum products implemented and later suspended due to rising oil price; large wage increases.	Increased prices for power utilities.
Fiscal Policies	Tax reforms; consumer and producer subsidy reforms.	Increased tax base/tax collection; increased revenue from the Citizen's Vetting Committees.	Initiated Medium-Term Expenditure Framework (MTEF).	Introduction of VAT; improvements in tax collection and administration, and import tax structures.
Structural Policies	Tariff regime simplified and made more uniform; removal of import restriction.	Financial sector reforms; investment promotion; divestiture of State Owned Enterprises (SOEs).	Permitted entry of the private companies into the telecommunication sector; Ashanti Gold Corporation floated; additional SOEs sold	Implemented poverty alleviation measures; accelerated divestiture program; liberalized the financial and petroleum sectors.

Source: Mensah *et al.* (2006)

[5] Students protested mainly in 1987/88 when the government introduced the university fees and cut the services for the them. Rawlings managed to control their opposition not only with repressive means, but also using divide-and-rule techniques and through the cooptation of moderate leaders.
[6] Ghana has been used as a sort of test for the new approaches of IMF and the World Bank. In fact, IMF left its monetary approach (the Polak model) for a comprehensive approach that included macroeconomic and structural policies to promote growth and balance of payment adjustment and to reduce inflation. At the same time, the World Bank, following the idea of an adjustment based on human centred development, theorized the need of fundamental structural changes to transform the African Economies (Hutchful, 2002).

The first phase began in 1983, when the PNDC introduced the structural adjustment program. The initial focus was on macroeconomic stability with the control of the inflation rate, the shift of prices in favour of exports and the elimination of black market activities on the national currency. The government moved closer to a fully flexible exchange rate, introducing in 1986 foreign exchange auction market (Mensah *et al.,* 2006).
The second phase started in 1986, focused on economic growth and had satisfactory results: a growth rate of 5 percent per year was reached, the domestic savings and public investments sharply increased, fiscal deficit of 4 percent turned to a 2 percent surplus and the government revenue rose. Private exchange bureaus were created to further liberalize the financial sector. A civil service reform aimed at enhancing the capabilities of administrative structures was implemented (Mensah *et al.,* 2006).
In 1988, a program of administrative decentralization was launched: *Metropolitan Assemblies* and *District Assemblies* (DA) were created with a certain amount of responsibilities[7]. *Regional Coordination Councils* were created in order to monitor, coordinate and evaluate the performances of the DA, as the first sub-structure of the national government.
In 1992, with the transition toward democracy[8], there was again 'fiscal indiscipline' and the deficit went again nearly the 4.9 percent. The government based its political campaign on a wide sets of spending policies, like for example the increasing of the wages of civil servants and of the producer price of cocoa or the 'election gifts' to the rural communities. This is why the third phase, starting with the election of 1992, was defined by Tsikata the 'oscillation phase': the largest part of the oscillation can be put down to political motivated government spending. "Since 1992, Ghana has been plagued by rising deficit, which have been financed primarily from domestic sources, through divestiture receipts and rapid accumulation of domestic debt" (Hutchful, 2002, p.66).
In 1994, the *National Institutional Renewal Program* was launched in order to coordinate reforms' efforts in the public sector. In this period, some important legislative acts were approved, like the *Investment Act* to liberalize public and foreign investments, the *Free Zone Act* to establish and regulate free zones for the promotion of economic development, and the *National Communication Act* to open the telecommunication sector to private actors (Mensah *et al.,* 2006).
The last phase of 're-stabilization and adjustment' began in 1997, when the budget deficit started to reduce and the domestic primary budget started to increase (from 0.3 percent in 1996 to 5 percent in 2000). In 1997, the government decided to adopt the exchange rate as the nominal anchor, without having the fiscal restraint to support this policy. As a result, the cedi experienced a speculative assault and a huge real depreciation. This led the country to adhere to the HIPC program (Aryeteey and Kanbur, 2005). In 2000 the cedi was again devaluated.
Since 1990s up to now, Ghanaian economy did not experience any important structural change; most of the reforms were concluded in that decade (Kraev, 2004).

3.2.3. Sector Policies

We review hereby the main features of the principal reforms carried out under the ERP in the following sectors: monetary, public enterprises, trade, health and education, industry and agriculture.

Monetary policies
According to Sowa (2003), during the 1990s there was an excessive attention on the stabilization policies and a consequent disregard on the effective growth of the country. In 1995, the inflation

[7] The District Assemblies (DA) were incorporated in the 1992 Republican Constitution. 70 percent of DA members are elected and 30 percent are appointed by the government. They derive their revenues from a special fund (the District Assembly Common Fund) instituted in 1992, that represent not less than five percent of annual national revenue.
[8] The PNDC allowed the establishment of a Consultative Assembly, under the pressure of international and domestic forces, who asked for the return to democracy. The assembly was charged to draw up a draft constitution to establish a republic, that was put to a national referendum on April 1992, receiving 92 percent approval. PNDC transformed itself in a political party, named National Democratic Congress.

rate reached 70 percent, so its reduction became the main objective of economic policies: interest rate was increased a lot, so that the banks were induced to lend to the Government. But, this generated a crowding out effect in the private sector and the consequent weakening of the productive base of the country. Bank credit to the private sector averaged less than 5 percent of GDP and the little credit received was often used to increase the working capital. In fact, investments were perceived as too risky since the high nominal interest rates and volatile inflation made real interest rate difficult to predict (Kraev, 2004). Moreover, the excessive amount of loans granted to the government caused the domestic debt increasing - together with the international debt that was increasing because of the aid flows -. Thus, interests on debt started to represent an important part of the public expenditure, certainly higher than the ones for education and health (Sowa, 2003).

Divestment of public enterprises

The restructuring and the divestment of public enterprises did not start immediately. It was not perceived as a priority from the Ghanaian establishment. State enterprises were more that 200 and, according to the 1984 census, they employed about 250,000 people[9].

In the middle 1980s, the government, after consulting a German firm in charge of a diagnostic survey of state enterprises, classified the latter on their strategic role and functioning. On the base of this classification, some of them were restructured, others were divested. Only a few of the restructurings improved their performances. Divestiture began in 1988 and it was made with the help of several foreign consultants given its technical difficulties. Despite this, a study of Bayliss (1998) that tried to understand the impact of privatization in Ghana, found that it had just a little impact on the development of private sector and that enterprises' performances did not improve after privatization. Moreover, they observed that the process benefited mostly the government, who used the sales of the enterprises to cover the deficit, and made short term revenue considerations. In fact, in some cases, potential future earnings were sacrificed for a one time receipt (Hutchful, 2002).

Trade policy

Until 1989 Ghana had an import licensing system. Now all items can be imported without approval, except for a limited number of items on a negative list. The import tariffs were reduced from 1983, with a simplification of the tariff system (0, 25 and 30 percent). In 1990, 1991, 1994 the system changed again. In October 2005, the system had a four-tier tariff structure, with rates of zero, 5, 10 and 20 percent. The rate of 20 percent applied to most agricultural consumer goods. There are no import quotas, in line with WTO's directions. Trade balance has been negative since 1983 (Khor and Hormeku, 2006).

Ghana has several schemes providing exemptions on certain imports: available data for 1998 revealed that some 40 percent of imports were exempt. Agricultural related products are included in the exemptions, but Ghana could raise its agricultural tariffs according to its rights in the WTO. The government has been constrained from making use of the flexibility because of pressures from the international financial institutions.

Health and education

Expenses for health after 1983 increased in absolute value, but mainly for the raise of salaries. In 1970, Ghana spent for health about 3 percent of GDP; during the 1980s and the 1990s the average was of about 1.7 percent. The cuts determined a detriment of the conditions of health facilities and undermined the moral of health care staff, who preferred to migrate abroad. The physician-population ratio dropped from 1:13,740 in 1965 to 1:22,000 in 1998 (Mensah *et al.*, 2006). In 1985 hospital fees were introduced to cover part of costs, with the effect of discouraging the use of the service: in 1988 about 48 percent of ill people did not consult a doctor and there is evidence that outpatient attendance in some rural areas dropped by 50 per cent (Sowa, 2003).

[9] The large number of state enterprises was the result of the take over of enterprises during the previous decades, which did not respond to a coherent vision.

This system was known as the 'cash-and-carry' system, because patients were required to pay up-front for health services at government clinics and hospitals. In 2004, the *New Health Insurance Scheme* (NHIS) was launched by the government: adult Ghanaians would pay a monthly subscription while the government would be in charge for health treatment of the elderly, the 'core poor' (e.g. the unemployed who do not receive any constant support to survive) as well as children of parents who both subscribed to the scheme. Nevertheless, the premium of 72,000 cedis is expensive for the average income of a rural family, and can not be afforded[10]. Another challenge is that rural families have irregular cash flow, so that they do not hold the required amount in cash at any one time of the year.
Public policies in the education sector after 1983 were mainly aimed at improving the quality of instruction: more qualified teachers were engaged, user fees on books were introduced – higher for the more elevated education levels – and subsidies for the tertiary level were eliminated. The expenditure for education dropped from 4-6 percent of GDP in pre-adjustment period, to 2-3 percent in the 1990s. These cuts caused the reduction of enrolment rates, especially among female population, both in primary and in secondary schools. The only positive effect of the reforms, according to Sowa (2003) was the displacement of resources from the tertiary to the primary school.

Industry and Agriculture
Table 3.2. shows the distribution of real GDP among the sectors of the economy over the years.

Table 3.2. Sectorial distribution of real GDP (period average percent)

Sector	1970-75	1976-82	1983-86	1987-90	1991-95	1995-2000
Agriculture	52	51	52	46	42	39.5
Industry	19	17	12	14	14	27.5
Services	29	32	36	40	44	33

Source: Aryeetey and Kanbur (2005). Data from GSS, Quarterly Digest of Statistics

Even if the share of agriculture on GDP declined during the last two decades, the agricultural sector still has a prominent role in the Ghanaian economy. The structure of the economy did not change significantly since independence. The country is still strongly dependent on its resource endowments (Aryeteey and Kanbur, 2005) and the export-led growth, dominated by gold, cocoa and timber, made the country highly vulnerable to international commodity prices fluctuations.
The increase of services is due to the growth of the 'low' service sectors, like wholesale and retail trade, restaurants and hotels. Industrial sector did not register the expected rate of growth. Its performances have been scarce as compared to the government programmes.
Ghanaian manufacturing sector, and in general the industrial sector, was characterized, at the beginning of ERP, by an excessive dependence from imported inputs, that – during the crisis – were not available. The process of industrial recovery and restructuring began immediately with the adoption of adjustment measures: the first objective was to increase the utilization of existing capacity through a better access to inputs, then the key industries should be rehabilitated and finally new investments should be done. Industrial output grew at an average of 8.6 percent annually, from 1984 to 1991. But this recovery began from a very low base, and only in 1994 the manufacturing production reached the 1977 levels.
Private investments were attracted by the unlimited repatriation of profits, by a reduction in corporate tax rates and by price incentives for export industries (Kraev, 2004). If the improved access to inputs facilitated the recovery of the sector, a number of factors contributed to restrain its growth. Devaluation raised the costs of inputs, the lack of credit and high interest rates constrained new investments, and, above all, the rapid liberalization of consumer imports hardly hit local manufactures, since the imports were too cheap for them to compete. The country should have had a gradual trade liberalization. Even the World Bank (1993) admitted that the transition to trade liberalization "might have been too abrupt for some industries" (p.49).

[10] From *Social Affairs*, "NHIS Inaccessible To Many In Poor Communities", July, 20, 2006.

It seems that the small and medium enterprises better adjusted to the new institutional environment[11] and those located in the smaller urban centres had the best performances. The main difficulties were the lack of credit, since they were not able to meet the lending requirements of the banks, and the lack of policy support (Hutchful, 2002).
On the contrary, the revival and the development of the mining sector was one of the targets of the *Economic Recovery Program*. Funds were allocated to recapitalize the gold mines and to reorganize the marketing of diamonds. The small scale mines, called *galahamse,* were legalized. New gold licences were granted. The good trend of the international gold price favoured the development of the gold mines and, in particular, The *Ashanti Goldfields*, which became one of the first African multinationals[12].

Today about 40 percent of the GDP is due to agriculture, but about 70 percent of the employment is dependent on this sector and other jobs are also linked to it. About 80 percent of agricultural production is from small holder family operated farms, mainly below one hectare. Larger holdings produce mainly cash crops as maize, pineapples, oil palm and rubber. The most important cash crop remains cocoa, about 80 percent of production is exported, mainly as cocoa beans (Hutchful, 2002).
An attempt to diversify agricultural export was the *President's Special Initiative on Accelerated Export Development* (PSI), launched in 2001 to stimulate private enterprises, improve productivity and create jobs in agriculture production and processing[13]. The operation was partially successful and the share of non traditional exports, mostly agricultural or processed agricultural products, on the total increased, but not so much as expected (Khor and Hormeku, 2006). The horticultural sector registered an important development since the end of the 1990s[14].

The rehabilitation of cocoa industry was the most important objective of the agricultural policy since the beginning of the ERP. The *Cocoa Market Board* (COCOBOD), which was in charge of the management of all the cocoa value chain, was turned into a statutory public corporation and was rationalized[15]. Only at the beginning of the 1990s, five private companies entered the market, in competition with the *Produce Buying Company*, who inherited the role of the COCOBOD. The penetration of the private companies in the market was however limited. The overall results of reforms in the cocoa sector have not been exceptional, but they succeeded in reversing the physical decline of the cocoa industry. The producer price did never reach the minimum level indicated by the World Bank, and this can in part be explained by the Government taxation on the sector, that remained elevated. The cocoa rehabilitation programme granted benefits not only to farmers, but also to the traders and to all the residents of the 'cocoa' areas, who took advantage from the improvement of the road and transportation facilities (Mensah *et al.,* 2006).
The cocoa sector has traditionally attracted the large farmers, not the smaller ones, who are devoted to food crops. Today, despite most cocoa is produced on small plots, a fourth of farmers receive over half of the total cocoa income.

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[11] Enterprises with less than 30 workers showed more dynamism in comparison to the larger ones. The main reasons were probably the availability of labour force coming from other sectors of the economy and the lower impact of devaluation and liberalization on their affairs since they were more dependent to the domestic resource base.

[12] Mining is the sector where the presence of foreign investors was – and still is – larger, and it is isolated from the rest of the economy. In spite of the investment incentives the sector received, it did not growth as much as it was expected (Kraev, 2004). Hutchful (2002) reports an interesting datum: in 2002 it was estimated that the 25 percent of total land area of Ghana was under gold mining, and most of them was in the forest belt. The pollution of land and water caused by large and small mines is worrisome.

[13] Support was given to non traditional exports, like canned foods (tuma), wood and aluminum products, yams, fish (salted, dried, smoked, frozen), crustaceans, oil palm products, bananas, pineapples, groundnuts and various vegetables.

[14] In particular, fresh pineapples from the eastern part of the country constitute about 40 percent of the export sector (Sofreco, 2002).

[15] Reorganization and reduction of staff brought the labour force from 100,000 people in 1984 to 42,000 in 1991. These reforms were necessary to reduce the marketing costs of COCOBOD and to raise the return of farmers, but the authorities were reluctant to accept the privatisation. The fall of world market price of cocoa in 1986 was an opportunity for the World Bank to intensify pressures on the government for the liberalization of the market.

The attention toward the cocoa sector since the beginning of the ERP has been higher than the one reserved to the rest of the agricultural sector, even if it accounted only for less than a fifth of agricultural GDP. The cocoa sub-sector benefited from increased producer prices and from liberalization of cocoa market, but the rise of the costs of fertilizers and the removal of subsidies on other useful inputs damaged the food sub-sector, that was already weak because the poor infrastructures made the transportation and storage costs very high (Kraev, 2004).
The rate of growth of the agricultural sector remained below the other sectors during the reform years and this was due to inefficient farming practices, to a strong dependence on rain-fed agriculture and poor transport and distribution channels (Aryeetey and Kanbur, 2005). Hutchful defines the agricultural sector as the 'Achille's heel' of adjustment. In fact, its performances have been under those of the other sectors during the 1980s and the 1990s. World Bank in 1993 admitted that agricultural sector suffered from deteriorating terms of trade, increased rural income differentials, reduced use of fertilizers, fragmentation of holdings, lack of growth of crop yields, massive damages of forests in the Western Region and increasing imports of certain agricultural raw materials capable of being locally produced. Some of these negative developments can be attributed to the erroneous policies suggested by the same World Bank (World Bank, 1993).
The first part of the agricultural program, inaugurated in 1984 with the *Medium Term Agricultural Development Plan,* was based on the belief that price distortions were the main cause of the low agricultural production. So, the liberalization of input markets, and the removal of subsidized prices would have been a stimulus for the food crop production. This hypothesis showed to be untrue: transport costs, high dependence to weather conditions and the lack of irrigation were the real constrains for farmers, who were not very responsive to price incentives (Hutchful, 2002).
The following plan, adopted in 1986, was aimed at "strengthening the capacity of the public sector to support research and extension services, irrigation and policy planning, and monitoring, evaluation and coordination; and make the investments necessary to expand agricultural production" (Sarris and Shams, 1991).
But the necessity of a wider approach to the agricultural sector was recognized, even from the World Bank, only in 1990 with the adoption of the *Agricultural Sector Adjustment Programme.* The plan was launched with the aim to achieve food security, create opportunities for rural employment, and diversify the exports to reduce the risk of commodity price fluctuation and to enhance the links with manufacturing (Ghana Government, 1993). Yet, the entire plan was based on the idea that a further liberalization of the agricultural market was necessary. In fact, the main measures were: the reduction of the role of the *Ghana Food Distribution Corporation* – that was responsible of an important percentage of food purchases –, the elimination of government control on the market of fertilizers and inputs, the divestiture of the *Farmers Agricultural Service Company* and the restructuring of the *Cotton Company* (see section 3.7).
Fertilizer subsidies had already been reduced from 80 percent to 15 percent between 1979 and 1989 and they were completely eliminated in 1990. At the same time, the government reduced also the provision of machinery at subsidized prices and eliminated the provision for pesticide sprayers. The elimination of minimum price support let the small farmers even more dependent from the prices imposed by traders. In addition to that, bank credits and government expenditures to the sector declined.
The liberalization of input prices also determined the drop of fertilizers consumption; and this decline obliged farmers to use land extensification instead of intensification and to cultivate also the more marginal lands. This process, together with the expansion of starchy staples – like cassava – that are more resistant to drought but accelerate the exhaustion of soils, had severe consequences for the environment (Hutchful, 2002). Environmental problems come also from the forestry sector that has been over-exploited: it had a rapid growth thanks to the credits and the removing of restriction to export for many species during the 1980s. The export volumes quickly rose, until reaching unsustainable level in mid 1990s. A report of Friends of Earth (1995) affirmed: "The impact of continuing exploitation of timber at 1993-94 levels would include commercial extinction of the 38 main species by the year 2010, together with the associated loss of jobs, export earnings and economic activity".

3.2.4. Winners and losers

The implementation of the above mentioned reforms saved Ghana from economic collapse. GDP improving and the drop of inflation allowed many industries not to go bankrupt and attracted foreign investments (Konadu-Agyemang, 2000). The main beneficiaries of the reforms were certainly the top executives in the public sector, private business man, the wealthy individuals and the commercial farmers who could take advantages from the higher producer prices for some crops (Mensah *et al*., 2006). The more vulnerable groups of the population, like rural households, unemployed or underemployed people or workers with low wages, have been negatively affected by the majority of reforms. It was expected a shifting from the non tradable to the tradable agricultural sector, that would have contributed to poverty reduction, but it was not so widespread to have a significant positive impact[16].
Devaluation had some detrimental effects: it undermined the real value of earnings, it pushed the prices of most important goods – including petroleum, medical supplies, agricultural inputs and education supplies – and it augmented the inflation rate (Mensah *et al.,* 2006). Debt servicing diverted resources from local needs (Konadu-Agyemang, 2000). In brief, the standard of living of many Ghanaians was severely compromised.
The greatest changes observed in the last few years in the labour market were represented by an increase in the employment, especially for younger workers, in urban areas and in the informal sector - most notably in building transport activities - that came at the expenses of a reduction in farming and self-employment activities. In 1980, the ratio of workers in the informal sector to formal was 2:1; by 1990, it arrived to 5:1 (ISSER, 1994).
The reduction of import duties negatively influenced domestic employment, contributing to the displacement of workers in the informal sector (Aryeetey and Tarp, 2000). At the same time, there was an increase in labour demand, driven by the increase in exports, but most of the newly-created jobs had a casual rather than permanent character (Cavalcanti, 2005). Kraev (2004) observes that the wage employment did not grow between 1985 and 2000: the labour force employed by the government was almost stable, the one employed in the state enterprises considerably dropped and the ones employed in the private firms registered a modest increase.

Adjustment policies contributed to enhance socioeconomic and spatial disparities both between rural and urban areas and between core and periphery regions. The removal of price controls on agricultural goods and the ensuing rise in prices should have contributed to job creation and to the rise of rural incomes and thus to the reduction of poverty. Still, this appears to have happened only in the cocoa sector, which interests just 19 percent of Ghanaian poor farmers. Moreover, rural poor have been mostly hit by the devaluation of the cedi (Konadu-Agyemang, 2000). The introduction of hospital user fees affected more severely rural households and savannah regions, worsening the disparities in the access to hospital and clinics or to schools.

The Ghanaian government introduced in the mid-1980s a foreign-funded programme that was explicitly designed to shelter poor from the adverse consequences of the adjustment process, the *Programme of Actions to Mitigate the Social Cost of Adjustment* (PAMSCAD). The program wanted to "enhance the sustainability and acceptability of the ERP" (Ghana Government, 1987), by offering assistance to the groups the more vulnerable to the negative consequences of adjustment[17].
In the same period, the first *Ghana Living Standard Survey* (GLSS) was launched with the aim of monitoring the impact of economic adjustment on the Ghanaian households. PAMSCAD turned

[16] A similar process has been observed from Beaudry and Sowa (1994) in the Western Region, where there was an important workers immigration because of the increase of the productions of cocoa, timber and the development of the mining sector.
[17] Four target groups were identified (small farmers and hired labour; poor households with limited access to social services; unemployed; households in the northern regions) and five types of projects were proposed: community initiative projects, employment generation projects, redeployment, provision of basic services and education infrastructures. The original idea was that the elaboration and the implementation of the projects would have involved the communities (Huchful, 2002).

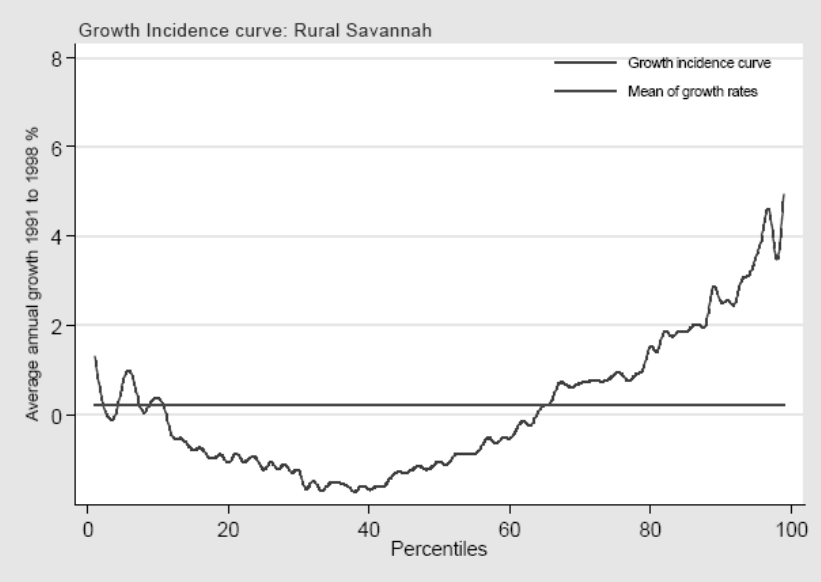
out to be a failure, and the poor did not derive any actual benefit because of the mismanagement of the funds allocated to the programme. A large part of the PAMSCAD funds were utilized for the redeployment of public servants, because it was a more visible policy, since they were considered the 'new poor'. According to Stewart (1995), the failure was partially due to the 'supply oriented' character of the program, that was reflective of donors' intentions but that paid little attention to the inclusion of the government and of local stakeholders. In fact, despite the original emphasis on decentralization, the control over the projects was centralized in Accra.
The failure to involve the local communities and the introduction of skills without a local relevance or incoherent with the local resources and knowledge have represented the most common design problems of most of the programmes supported by international donors (Sowa, 2003)[18].

Poverty trends
Ghana achieved pro-poor growth in absolute term (e.g. a growth that reduces 'monetary' poverty), but once disaggregated by regions or by sectors, the picture is more articulated. According to Mckay and Aryeetey (2004) the extent and the depth of poverty in Ghana is due to the absence of efforts to change the structure of the economy since colonial times. The country is still dependent on its geographical characteristics and resources. The absence of reforms on land tenure, agriculture or labour market, together with the low performances of industrial sector, are proves of this political deficiency.
According to GLSS data, poverty headcount index fell from 51.7 percent of the population of 1991/92 to 39.5 percent of 1998/99[19] (GSS, 1995b; GSS, 2000c). The extent of poverty reduction is less if we use a lower poverty line to calculate the headcount index (from 36.5 to 26.8 percent)[20]. In the same period, Gini index has increased from 0.373 to 0.388. These are overall indicators, which hide the wide differences existing between urban and rural areas, between man and woman, among geographic locations and among economic activities.
Qualitative studies, like Norton *et al.* (1995) or Kunfaa *et al.* (1999) find opposite trends for poverty, since they argue that both in rural and urban areas there is the perception of a living standard worsening.
In rural areas the situation is worse than the one prevailing at the country-wide level, as 34.4 percent of the rural population was identified as extremely poor in 1998 against 11.6 in urban. The process of urbanization has partially contributed to the reduction of poverty in rural areas. Poverty reduction concentrated in Accra and in the rural forest zone, while northern savannah remained the poorest area. However, there are many poor districts in the south of the country, especially in the coastal areas and in Eastern Ghana.
For the overall Ghana, the growth incidence curve[21] is positive and upward sloping: it means that between 1991 and 1998 there was a faster rate of growth for the higher percentiles, so

[18] The PAMSCAD experience influenced the subsequent poverty alleviation programme, which adopted a more decentralized approach: until mid 1990s, a number of projects in several fields and elaborated by a number of agencies were implemented without any coordination effort. The *Policy Focus for Poverty Reduction* produced in 1996 by the purposively instituted *Technical Committee on Poverty*, was an attempt to refocus the interventions against poverty on the priorities and perceptions of poor (Hutchful, 2002).
[19] Main quantitative sources of information on poverty in Ghana are: DHS that have been conduced in 1987, 1993, 1998 and 2003; CWIQ conduced in 1997 and 2003; GLSS of 1987-1988-1991 and 1998 and the 2000 Population and Housing Census. Important qualitative sources are Norton et al. (1995), who made a participatory poverty assessment in some communities and the study *Voices of the Poor* of Kunfaa (1999).
[20] It is interesting to recall the arguments by Kanbur (2001), who clearly argues that - notwithstanding the evidence provided by the various surveys - the claim that poverty has fallen down is unsubstantiated. The author sustains that these figures do not account for the worsening of public services and do not reflect apparent regional disparities in the evolution of poverty and across different socio-economic groups. Moreover, although the incidence of income poverty has fallen down, the fast rate of growth of the population could have entailed an increase in the absolute number of people living in poverty. Thus, it is not surprising that the perceptions of Ghanaians and of field-workers could differ from the one provided by the official figures.
[21] The growth incidence curve (GIC) has been constructed using GLSS data for 1991 and for 1998 as follow: "ranking households from the poorest to the richest in each of the two years, it then plots the annualised growth rate at each percentile point of the distribution, comparing the later distribution with the earlier" (Mc Kay and Aryeetey, 2004, p.21).

inequality increased. The rate of pro-poor growth is in fact 1.3 percent for the 20th percentile, 2.1 percent at the poverty line and 3.2 at mean.

Figure 3.1. Growth Incidence Curve for Rural Savannah



Source: Mc Kay and Aryeetey (2004)

Repeating the same exercise for the sole Greater Accra, the rate of growth is higher in the poorest percentiles, so the slope of the growth incidence curve is negative, indicating a falling inequality. In the rural forest, the rate of growth is high for all the percentiles and the distributional impact is more neutral. In the other localities (other urban areas, rural costal and rural savannah) the growth incidence curves show increasing level of inequality. In the rural savannah, growth rate is negative for most of the lower percentiles and the slope of the curve is positive (Mc Kay and Aryeetey, 2004).

There are important differences in the extent of poverty reduction also when households are classified according to their main economic activity (Mc Kay and Aryeetey, 2004). Export farmers had largest rates of poverty reduction, and to a lesser extent also wage earners and non farm self employers. In the forest sector, also food crops farmers registered some reduction in poverty.

Mc Kay and Aryeetey (2004) look at the sources of income in the various geographical zones as an instrument to understand how households have been able to achieve better consumption levels. They observe that in Accra the main driving factor behind poverty reduction was the increase of the number of people working in trading activities – both male and female -. Even the construction, transport and the communication sector have been important sources of poverty reduction. Instead, in rural forest zone, the most important factor driving out of poverty is represented by remittances and, only in the second place, by agricultural activities. Small farmers cultivating cocoa largely benefited from the recovery of the sector.

The authors observe that in the other zones the structure of the economy has not changed a lot over the decade, even if the role of remittances has increased and there is some evidence of farmers selling some of their output and involved in agricultural processing activities.

Besides monetary poverty, we are interested in the trends of some non-monetary indicators. While all data agree on the fact that education improved over the 1990s (e.g. literacy rates and primary enrolment rates increased), health indicators are mixed. For example, life expectancy did not increase over the decade. And GLSS data show a worrisome decline in the use of health facilities, that has been confirmed by the CWIQ data, that show the same trend between 1997 and 2003 and also an increase in the rate of under five malnutrition.

The access to key assets, like housing, productive assets or durables goods generally improved, according to GLSS and DHS data (Mc Kay and Aryeetey, 2004).

3.3. North-South divide

One of the most impressive change occurred in Ghana between 1991 and 1998 is the increase in inter-regional inequality. Table 3.3 shows the population shares and the Gini coefficient for each geographic locality of the country in 1991/92 and in 1998/99. We observe that, although inequality slightly reduced in the overall country, it increased in the cost and in the rural savannah. Rural savannah is almost entirely constituted by the three northern regions: Northern Region, Upper East Region and Upper West Region[22]. All the North accounts for about 40 percent of the country area, but it accounts for about 10 percent of the country population, 77 percent of whom live in rural areas. Inequality is particularly elevated in rural areas, while northern urban data do not show a great variation from the southern average data.

Table 3.3. Inequality by geographic locality, measured by Gini coefficient, 1991/92 and 1998/99

	1991/92		1998/99	
Location	**Population share (percentage)**	**Gini coefficient**	**Population share (percentage)**	**Gini coefficient**
Accra	8.2	0.364	8.8	0.269
Urban Coastal	8.7	0.307	7.8	0.356
Urban Forest	11.0	0.343	11.8	0.315
Urban Savannah	5.3	0.359	4.8	0.278
Rural Coastal	14.2	0.325	14.6	0.340
Rural Forest	29.6	0.342	31.6	0.299
Rural Savannah	23.1	0.333	20.6	0.384
All	100.0	0.373	100.0	0.368

Source: Coulombe and McKay (2004). Data source: GLSS3 and GLSS4

Thus, northern regions suffer from the highest level of economic inequality. The area has a very low rate of growth; per capita GDP is considerably lower compared with the rest of Ghana. In 1998, the national average was about 4,790,000 cedis, and that of the North was about 2,450,000 cedis (IMF, 2005a).[23]

Between 1991 and 1998, Northern Ghana grew slightly with poverty levels remained unchanged. In that period, poverty incidence increased both in Northern Region (from 63 percent to 69 percent) and in Upper East Region (from 67 percent to 88 percent); instead, in the Upper West Region it dropped from 88 percent to 84 percent (Ghana Government, 2003). The incidence of poverty is significantly lower in the Northern Region, while the Upper East is particularly disadvantaged: it has always been the poorest region, vulnerability and food insecurity are widespread and its population density is elevated.

In table 3.4, we have reported some key welfare indicators by region. Rural urban disparities are considerable for all the indicators.

[22] The Northern Region is the largest region of the country. Tamale is the capital and it is the main business centre of the entire North. In the town there are modern infrastructure services. But in the rest of the region infrastructure facilities are inadequate. Upper East and Upper West were a unique region until 1983. More than 90 percent of population of Upper East live in rural areas, the capital – Bolgatanga – is densely populated. The capital of the Upper West Region is Wa; more less 85 percent of the population of the region live in rural areas.

[23] In 1998 the exchange rate was about 2300 cedis per 1 $. Today 1 $ is about 9300 cedis.

Table 3.4. Selected indicators of Welfare by regions

Welfare Indicators	All Ghana (percentage)	Northern (percentage)	Upper East (percentage)	Upper West (percentage)
Adult literacy rate	53.4	22.6	23	24.4
Youth literacy rate	68.7	35.7	45	46.2
Primary enrolment	69.9	49.9	56.1	51.1
Access to primary school	85.4	80.1	61.9	67.1
Secondary enrolment	38.1	16.2	19.5	21.3
Access to secondary school	43.3	21.5	7.9	17.2
Health access	57.6	35	26.7	30.4
Delivery by health professionals	51.8	16.5	24.2	31.5
Stunted children	32.4	39.0	28.8	25.0
Wasted children	15.5	10.7	16.6	9.7
Underweighted children	25.8	25.5	21.1	16.2
Unemployed	5.4	2.0	13.2	4.0
Underemployed	13.6	6.7	13.2	8.4
Difficulty with food needs	12.8	8.7	40.3	23.3
Access to water	94.0	80.2	90	87.7
Safe sanitation	55.0	23.5	10.7	23.3
Access to electricity	50.6	28.8	14.7	18.0

Source: GSS (2005)

Adult literacy rates in Northern Ghana are the lowest of the country and youth literacy rates are well above the national average. In this area, there are the lowest rates of primary enrolment in the country, even if they have rapidly expanded. In all the country there is an important difference between primary and secondary school enrolment, indicating a high drop-out of pupils. In northern regions the situation is more problematic because secondary school enrolment declined from 1997 to 2003. The gender gap is greater than in the other regions. Upper East and Upper West are the only regions where less than 80 percent of pupils live within 30 minutes walk from primary school. These are the only three regions where most of the pupils declare to be unsatisfied with their school (GSS, 2005). One of the main difficulties for the school system in the North is the lack of trained teachers, since they often refuse to work in poor and remote areas (Konadu-Agyemang, 2000). From the *Ghana Child Labour Survey* (ILO-IPEC, 2003) emerges that the households of most children not attending school in the Upper East could not afford the cost.
Malnutrition and stunted growth are correlated with delayed enrolment in school: health factors are important in determining attendance, retention and drop out (Fentiman *et al.,* 2001). In the three regions, the proportion of households living within 30 minutes walk from the nearest health facility is low, and the percentages are even lower for the sole rural areas. Among those who consulted a health practitioner, the satisfaction level is quite good. The percentage of females who receive prenatal care is in line with the national average of 93.4 percent, and surprisingly Upper East Region record is higher than the average. Nevertheless, the number of women assisted by trained health professionals at birth is low if compared to the other regions, with the Northern Region registering the worse level in the country (only 16.5 percent).
The ratio of medical staff to population is well below the national average: in 1999 there were 71,912 persons per doctor in Northern Region, 43,221 in Upper West, 57,591 in Upper East against an average of 26,623 in the other regions (Shepherd and Gyimah-Boadi*,* 2005).
The nutritional status of children in the North is comparable to the one of the other regions, even if the Northern Region registers the worst data as regards stunting. Upper East Region, followed by Upper West, is the region where the percentage of households having difficulties in achieving their food needs is higher.
Northern Region have the lowest level of access to water sources in the country, and the other two regions are under the national average. Use of safe sanitation facilities is not widespread in the area, and the same is for waste disposal and electricity.
Infrastructure in the area is still inadequate, as since the 1980s little investments have been made in the road network. There is only one road well connecting the North and the South (e.g. the Tamale-Techiman road) and interregional roads are very poor. The governmental

interventions are focused on the maintenance and construction of feeder roads in the rural areas, aimed to connect them to social infrastructures.
Financial infrastructures are also inadequate: several districts have no banks, the amount of credit services managed semi-formally or informally is very high: NGOs, credit unions, credit cooperatives and money lenders substitute banks, which are even less prone to lend money because the rate of repayment is low and there are a number of additional risks that have to be faced: weather, conflict, variability of supplies, lack of infrastructures and remoteness from key governance institutions (CEPA and ODI, 2005).
Another important difference between the North and the South is in the role of remittances. Ghana is a 'migrant economy': according to the GLSS data a large proportion of households receive a significant amount of remittances. The phenomenon is most common among urban households, and is much lower in rural savannah. Despite the role of remittances is even more common in the northern regions - as we will see in the following chapter - it remains incomparable to the levels of southern ones.
The persistent inequality between the North and the South could be explained partly by geographic[24] characteristics, but it can be mainly traced back to historical factors. A brief history of the area could help understand the origins of the disparity between these regions.

In pre-colonial times the Ashanti kingdom had a relationship of hierarchic dominance with the northern ethnic groups. The development of the Ghanaian states was related to the ability to play a key role in trade and in the related activities. When European arrived and the centre of trade became the coast, the Ashanti functioned as the major state combining trade and direct production of gold and kola nuts. When slave trade began, it had a devastating effect on the Ghanaian 'middle belt', which was the main sources of slaves: towns, villages and trade routes were destroyed and burnt, and the population started to decrease. This is why this area, once densely populated, became sparsely populated.
Between 1830 and 1850, there was the transition from slave to legitimate trade (e.g. palm oil, rubber, cotton) and the export crop development began. Main regions of production of the traded goods were the territories of the 'middle belt'. Production was on a small scale and it was directly managed by Africans, except for mining and timber. Also the production of cocoa was started and expanded by Ghanaians. The colonial government realized the necessary infrastructures for trade: railways soon connected the coast, Kumasi and Accra, but there was no attempt to connect the Northern territories. Colonial government also invested in education, but in the North only a minimal education was provided. Even the efforts of missionaries were discouraged. The reason was that the southern productive sectors needed a cheaper, unskilled and submissive labor force from the North: a deliberate labor recruitment policy was put in place in the peripheral areas of Northern Ghana, which became a labor reserve zone (Shepherd and Gyimah-Boadi, 2005). The British tried to gain the collaboration of local chiefs to recruit young workers; in fact they did not intend to substitute the indigenous power. Northerners did not benefit from migration: remittances were minimal and did not induce any development. On the contrary, migration caused the depression of local economic activities.
The transition toward the independent state saw the birth of federalist political party, the *Northern People Party* (NPP), constituted by the most educated Northerners who were afraid to be completely dominated by the South in a unitary state.
In the post colonial period, the centre-periphery system became established: the northern regions remained the labor and food reserve for the 'middle belt' and for the new industrial core that was increasing in the coastal area on the Accra-Tema-Takoradi line. Migration from the depressed regions increased toward Accra and the old Ashanti Region. This process started to reverse in the 1970s, when the economic crisis was close to arrive and a period of de-urbanization began.
In fact, in that decade governments invested on Northern Ghana, elaborating several plans to develop its resources. The State supported the modernization of agriculture in the region with

[24] The entire southern area is covered by the savannah. Nevertheless, in Burkina Faso, where there are almost the same agro-climatic conditions, institutions and infrastructure have allowed its people to make better use of the endowments.

massive investments. The town of Tamale – today the third urban centre of the country – grew very quickly during the 1970s because of the large scale subsidized rice cultivation. This initiative was integrated in the operation *Feed yourself* and *Feed your industries*. In the same period, cotton and tobacco productions were stimulated and resources were allocated to explore mineral sources. Tomato canneries were established and some important irrigation schemes were completed. These import substitution policies had positive effects on regional development, but they proved not to be financially sustainable (Songsore, 2003).

The era of structural adjustment and liberalization that followed stopped this trajectory of growth. Northern economic interests were ruled out from the design of national economic policies. As we saw in the previous paragraphs, economic recovery funds were directed toward the export sector and toward the industrial core. None of the important export goods comes from this area. Even private investments had the same preference for industrial core: Greater Accra attracted more than 80 percent of investments.
Food crops typically produced in Northern Ghana were not among the priorities of the ERP, so they received very little price support. The distance from the ports and from the industrial core made prices of consumer goods higher in the North than in the rest of the country, due to the cost of transport. Respectively, Northern farmers secured sometimes less than 40 percent of the final value of their crops sold in the South.
Thus, the region remained relatively at the margin of the processes of globalisation that interested the country, but international competition constitutes a problem even for Northern Ghana. In particular, European subsidies to cotton damaged Ghanaian cotton producers, all concentrated in this area of the country and imported rice damaged the local produced one (see section 3.7.1).
Government[25] and international institutions thought they could compensate for the competitive disadvantages of the area through a larger welfare state in comparison to other regions, providing more infrastructures, access to potable water and better health services. International aid, that registered a big increase, financed such a number of projects that its role became excessively strong in comparison with the role of institutions[26].
Perverse effects of aids seem to be particularly heavy in an area where external intervention is so significant. It is extremely frequent the personalistic use of aid from the local elite, who often are the real beneficiaries[27]. Studies show that the strong dependence from external funds and from constraints imposed by foreign partners sap the project efficacy (Porter, 2003). Sheperd (2005) critics the NGOs 'localism': their small scale projects diverted the attention from changing the structure of the economy.
There is great debate on the overall impact of aid interventions. Sowa (2003) observes that it has been extremely moderate because market based policies have been applied on an area where subsistence economies prevail. Instead, according to the CEPA and ODI report (2005), it seems that these interventions have raised the human development level of the area, which is now comparable to that of the rest of the country. From the data, contrasting indications seem to emerge. Some indicators show important improvements, like for example the proportion of adult people who have attended school, or the access to health services, to secure sanitary conditions and to potable water. Other indicators illustrate ambiguous and unstable trends: infant mortality

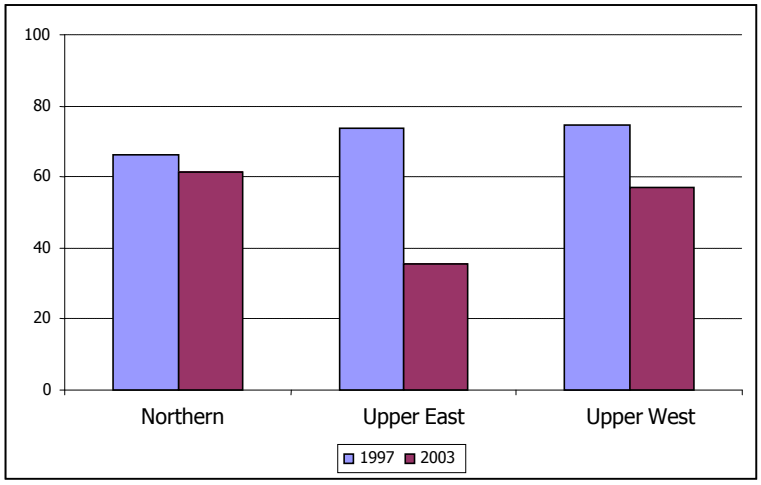
[25] With the creation of District Assembly, one of the intentions was to strengthen the capacity of the local institution to plan and implement local development. Federalism should have transformed the regional elite from a purely claiming to a serving or responding one, giving it responsibilities. But this capacities remained weak (Shepherd and Gyimah-Boadi, 2005). District Assembly in Northern Ghana strictly depends on the national funding: about 95 of their revenue is constituted by the District Assembly Common Fund, since their capacity to generate resources internally is very weak.
[26] One of the key development programs in the North was the *Northern Region Rural Integrated Program* (NORRIP). This project started in 1998 and was funded jointly by the Governments of Ghana and Canada; its main objective was the provision of a sustainable potable water supply and sanitation. Botchway (2000) has analyzed the limitations of this scheme, underlying the excessive attention to the 'participation' notion, which diverted attention away from structural causes of poverty.
[27] Lots of NGOs have been established from local politicians with the purpose to secure the money of international cooperation. Mohan (2002) underlines that often local partners and rural poor are marginalized from decisions.

rate and under five mortality present important improvements in the Upper East Region, but only a weak progress in the Northern Region and a worsening in Upper West. Moreover, not all the nutritional indicators show positive changes, and – as it has been showed in table 3.4 - the differences with the rest of the country remain pronounced both in the health and in the educational fields.

3.4. Main features of the Northern Ghana economy

The degree of diversification in the livelihood strategies of households in the North is lower than in the rest of the country: in terms of its economic base, this area has remained more dependent on low income food crop farming. Nevertheless, CWIQ data indicate a clear reduction of the percentage of persons engaged in agriculture and related activities between 1997 and 2003, especially in Upper East and Upper West Regions.
Moreover, nearly half of households receive some income from remittances, and this proportion - as well as the share of income derived from remittances - increased over the 1990s (GSS, 2000 and GSS, 2005). However, as it is clearly illustrated in figure 3.2., farming remains the most important income source for the Northern population.

Figure 3.2. Persons aged 15 years and older employed in agriculture, forestry and fishing in the three Northern regions. Percentages.



Source: GSS (2000) and GSS (2005)

The large majority of people is self employed and works in the private informal sector - approximately 90 percent of working age individuals -. The percentage of people older than 15 years that are not economic active is higher than in the rest of the country: 31.9 percent in Northern Region, 38.4 in Upper East, 39.3 in Upper West, against 27.9 in the country as a whole (GSS, 2005).

3.4.1. Farm activities

Like in many part of Sub-Saharan Africa, the farm household is a production-consumption unit, where farm products are cultivated mainly for home use. The most common form of organization in Northern Ghana is the compound system: households generally live in circular compounds where each individual member has his own dwelling. The compound head is responsible for providing the food for the main meal, while senior women have the responsibility to provide soup ingredients. The basic food production is provided from the compound plot, where all the members are required to farm. In addition, each member can cultivate private plots in order to have additional food and cash income (Poulton, 1997).

Besides the compound, another system is the bush farm, which is even less common because of population increase (Obeng, 2005). The majority of households cultivate less than one acre of land.
The control of land in Northern Ghana resides with the paramount chief of the area or with the *tendanaa* – meaning the first settler, he is usually the pioneer settler of village – who holds the land in trust for the people and exercises this right through a hierarchy of local chiefs. The chief of the village allocates land to individual compounds. Virgin land can be asked for cultivation by any member of the community. Once somebody gains access to a parcel of virgin land, he continues to use the land as if he owns it, he can pass the land to his heirs, but the purchase of the land and long term leases are not permitted.
The most common cultivated crops in Northern Ghana are rice, millet, maize, sorghum and groundnuts. These crops are cultivated by almost every household. Table 3.5 shows the percentage of farming households producing some of the main crops of the region.

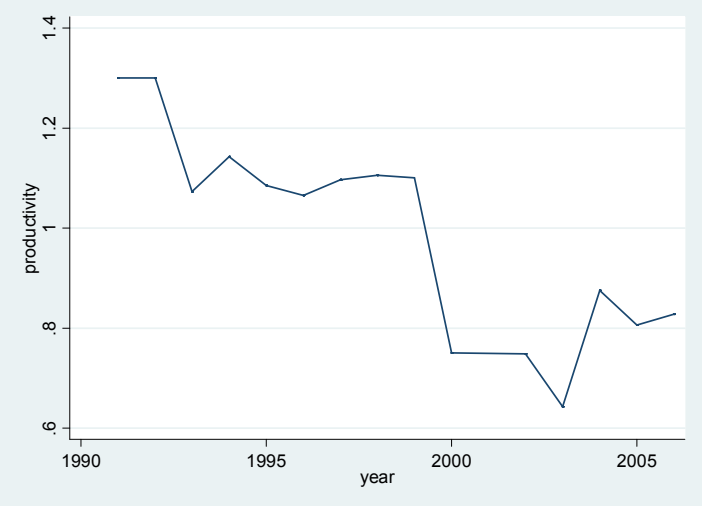
Table 3.5. Percentage of farming households producing main crops, 1998/99

Region	maize	millet and sorghum	rice	groundnuts	yam	tomatoes	cotton
Northern	86.6	66.9	18.9	57.1	36.3	24.3	7.9
Upper East	52.2	84.4	53.4	77.8	40.6	15.4	5.7
Upper West	30.4	88.2	69.5	72.2	0.0	10.1	1.0
All Ghana	72.0	51.4	26.3	49.1	31.3	24.9	3.9

Source: computations from GLSS4 survey

The main staple crops are millet and sorghum for the Upper East and Upper West Regions. Millet is comparatively more drought resistant than other cereals and requires less rainfall (MofA, 2006). Few households sell millet and sorghum. Between 1995 and 2003 the small grains show declining levels of production in the Northern Region and in Upper West. Figure 3.3 shows the figures for sorghum in the Northern Region.

Figure 3.3. Sorghum productivity in the Northern Region (1991-2006)



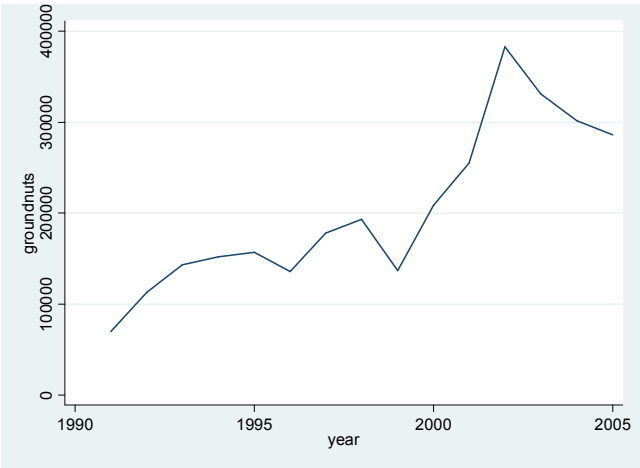
Source: Computation of the author from MofA-Statistical Office of Tamale (2007)

Maize is the most important staple crop for the Northern Region, its production declined in the last years[28]. Small grains are the crops with the least commercial potential. Instead, groundnuts

[28] There is imperfect substitutability between maize and other crops when relative prices change, because buying in maize is seen as a sign of failure to satisfy the food necessities of the compound's households. Cultural traditions prioritize the cultivation of maize, so that if relative price is adverse or if maize yields fall, compound head is likely to respond increasing the maize acreages.

are the most widely sold common crops with the widest potential together with soybeans, which is a quite recent crop. In last years their production has registered a big increase. Both are food and cash crops and so they are very attractive for the farmers.

Figure 3.4. Production of groundnuts in the three Northern Regions - metric tons



Source: Computation of the author from MofA- Statistical office of Bolgatanga (2007); MofA- Statistical office of Wa (2007) ; Mofa-Statistical Office of Tamale (2007)

Groundnut is the most popular and widely cultivated legume in Ghana because of its soil adaptation and because of its limited field pest problem[29].
Yams have had a worrying decline in yield because of the increasing production through expanding cultivated area, that have had substantial environment costs. The production has increased without any state or large scale private investment.
Vegetables are mainly cultivated as an intercrop, mostly with field crops such as cereals in the rainy season. They are produced by most households, but sold by few of them. Some households establish backyard gardens to ensure all year round availability of vegetables, which are used as food supplement (WFP, 2004). Although dry season gardening is carried out almost exclusively as part time occupation, it contributes to meeting the growing local demand and to increase household incomes. Dry season gardening is largely practiced near the dams or dugouts.
Among vegetables, local tomatoes had a particular role in the past, especially in the Upper East region. In the 1960s tomato farming was assisted by the government with irrigation projects and the establishment of tomato processing plants. The most important irrigation project was the *Tono Dam*, which was built between 1975 and 1985 in the Upper East Region and constituted one of the larger dams in West Africa. Three public tomato canneries existed in the country, providing equipment to small farmers and guaranteeing them market access for pre-agreed quantities. The tomato canning factories were sold and the restrictions on tomato imports were removed during the 1990s, as a condition of the ERP. The consequent invasion of Ghanaian market from EU subsidized tomatoes caused the collapse of the demand for local tomatoes, impacting negatively on livelihood of tomato farmers (Khor and Hormeku, 2006).
Recently the *Integrated Tamale Fruit Company* (ITFC) enterprise has tried to develop the cultivation of organic mango, and the debate on the convenience of this kind of production in Northern Ghana is wide. Intensive production is possible because the climate is ideal for mango plantation, but the sector is very competitive, world prices are on decline and Ghana has little comparative advantage.

[29] It is eaten in many forms (fresh, dried, roasted, boiled or processed) and it is served at funerals and in other important functions. The seed is processed into oil for cooking and cake for animal and human feeding; the vines are used to feed sheep goats and cattle. Moreover, groundnut help to improve soil fertility thanks to its capacity to fix nitrogen (MOFA, 2006).

Rice

Rice has been for long time the most important cash crop for the region. During the 1970s government strongly supported its production and the *Agricultural Development Bank* gave loans to peasants. Most of them were among the wealthier of the area, and were able to constitute large scale commercial rice farms. Investments in roads and infrastructures for rice farming gave benefits also to the other crops. A regional casual labour market developed. Soon rice farmers were able to supply almost all the consumer needs of the country. Ghana also exported rice to neighbour countries.

From 1989, when the rice market was opened up, rice production became problematic. Imported rice from Vietnam, Thailand and United States had modified population tastes, so the purchasing of the local produced rice has become very difficult (CEPA and ODI, 2005).

Nowadays, a large part of the imported rice comes still from the United States, where rice farmers are highly subsidised and can sell rice at prices below their production costs. The Ghanaian production is made in a smaller scale and with few external inputs, few farmers use tractors and irrigated rice is difficult because of the lack of water (Shepherd and Gyimah-Boadi, 2005).

In 2003, Ghana parliament decided to improve the tariff for rice – still in compliance with the WTO obligations -, but it received pressures from IMF not to make use of its right of flexibility to protect the sector (Khor and Hormeku, 2006).

Cotton

Cotton has been the major cash crop in many parts of the North since the mid 1980s. Investments in the sector began during the 1960s, as an import substitution policy. The *Ghana Cotton Development Board* (CDB) was instituted in 1968 to encourage smallholder cotton production: the company provided ploughing services and extension advises to farmers, besides the seeds and all the necessary production inputs. The company was committed to provide this package of pre harvest services to producers on credit. The production was entirely located in Northern Ghana and it rose until 1976, when the CDB started to have financial difficulties.

In 1985, the CDB was transformed into the *Ghana Cotton Company* (GCC), whose 30 percent share was retained by the government until 1995. The market was liberalized, so new cotton producers could enter the market, but the GCC remained the dominant firm in the sector. Production considerably increased from the low levels of early 1980s. The cotton lint was exclusively sold to the domestic textile companies until 1993, when a cash flow problem experienced by the textile firms convinced the government to authorize the export of lint. By 1996, the involvement of the government in the sector was minimal (Poulton, 1997).

Despite Ghana's comparative advantage in its production, cotton industry has been in decline since 1999[30]. Today the number of cotton producers is small. The decline has several explanations: the increasing costs of production, mainly due to the raise of fertilizer's prices; the liberalization of the market and the lack of coordination among the cotton firms.

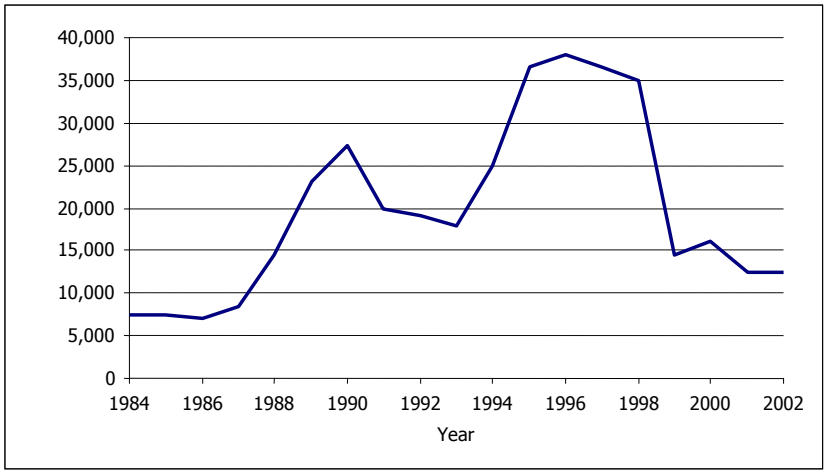
European and American grants to their own production have damaged Ghanaians producers. International prices are in fact lower than production prices in Ghana.

Yet, the collapse of the cotton sector was also due to the institutional arrangements that were not capable of sustaining the interests of farmers, buying and processors. Since 1990, fertilizers prices have risen faster than lint prices. The cotton firms held down the seed cotton price paid to farmers in order to protect profit margins. So, cotton was less profitable for farmers. The increasing cost of fertilizers damaged not only the cotton, but also all the other crops. Farmers, who could not afford this high cost, started to divert the inputs they should use for the cotton: they started to apply fertilizers to food crops (in particular to maize and rice) or to sale them to other farmers or to traders to obtain cash. Their objective was minimize food insecurity, not to maximize profit, so they grew cotton only if it permits them to earn enough money to buy more

[30] In Ghana cotton never became a significant export crop, while the near Burkina Faso gain more than 50 percent of its foreign exchange from cotton. However the growth of the cotton sector in Burkina did not contribute a lot to poverty reduction.

food than could be obtained applying the same inputs to a 'food plot'. Sometimes farmers registered to grow cotton simply to obtain inputs for other purposes. (Poulton, 1997).

Figure 3.5. Cotton production in Ghana (1984-2002) – metric tons



Source: Cepa and Odi Report (2005)

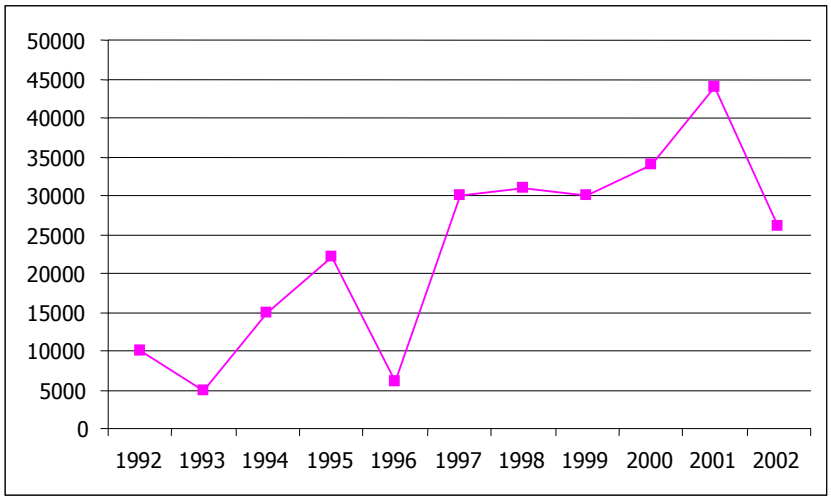
Obviously this practice severely reduced the yield of cotton and – as a consequence – the earnings of the cotton companies. The problem was that the only way companies had to penalize farmers was the threat not to renovate the contract with them. This was not sufficient, since farmers could ask working with a different company. Multiple purchasing companies could compete for business in a village, so that they were not able to recovery loans given to farmers. In brief, a failure of coordination occurred because of the difficulties in managing competition between numerous cotton buying companies. In 2001, a zoning system was introduced to create local monopolies, but the allocation of concessions was problematic and the system did not work: the *Agricultural Development Bank* was not able to regulate the competition (CEPA and ODI, 2005).
Today, cotton is more profitable where there are less marketing opportunities, where there is less pressure to land and where the main crops are less responsive to fertilizers.[31].

Shea Nuts
Shea nuts only grow in Guinea savannah zone: Northern Ghana and Burkina Faso produce the best quality of shea butter, especially for the cosmetic industry.
The promotion of shea market was an objective of Rawlings' government, who believed this was a good way to improve economic condition in the North of the country. The *Shea Nuts Farmers Societies* were established in 1984; they were controlled by the government and served as the central point of shea collection. Nuts could be purchased only by society members to the representatives of the PBC at a fixed price. At the beginning of 1990s, the state purchasing activities were slowing down because of low prices and farm surplus. Farmers were unsatisfied and the process of privatization begun (Chalfin, 1996). A number of private companies entered the market and only a few of them were Ghanaians.
Today a few companies based in Europe control the import market for shea nuts. They sell mainly to the chocolate manufacturers, because the shea nut by-products are among the principal ingredients in cocoa butter equivalents. There is an expanding number of cosmetic firms

[31] A scheme that had good results is the 'commercial farmers' scheme adopted by *Plantation Development Limited* company in mid 1990s: they selected 160 of their best farmers, who with the assistance of their technicians and loans to hire labour, were required to produce a mean yield of 1065 kg per hectare, well above the usual yield. This approach is based on the idea that is better to create an elite class of wealthy small scale commercial farmers rather than trying to disperse inputs and services to a large number of smallholders who do not have the right incentives. This approach proved to be more efficient, but obviously less equitable (Poulton, 1997).

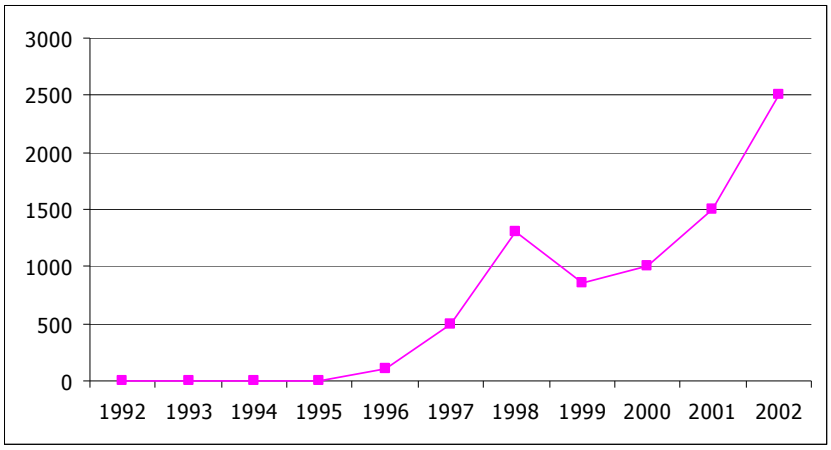
using shea butter as a basic ingredient, since it is becoming increasingly popular especially in France and the United States. The growing importance of this sector is proved by the positive trend of export of both butter and kernel from Ghana, as evidenced in figures 3.6 and 3.7. Export market prices have tended to fall since 1998, following that of cocoa butter. Today, around 10 percent of production of shea nuts and shea butter is exported[32].

Figure 3.6. Kernel export from Ghana (1992-2002) – metric tons



Source: CEPA and ODI Report (2005)

Figure 3.7. Butter export from Ghana (1992-2002) – metric tons



Source: CEPA and ODI Report (2005)

But there are some important constraints to the development of this industry: fist of all the absence of intermediary institutions between producers and buyers, who should be able to offer advice on what the market wants, on the technologies able to deliver this and to influence the price of shea kernel, that are affected by high seasonal variations. The absence of trust in contract agreement and the lack of access to credit and high transport costs are other important constrains to the development of the sector. Finally, there are not well established producers' associations – like in Burkina Faso – able to support shea producers and assure the quality of the product[33].

[32] Cf. *Gateway to Africa* website: http://3fghana.com/index.htm
[33] For a more detailed history of shea sector in Ghana, see Chalfin (2004). For an analysis of the potentiality of the sector in West Africa, see Lovett (2004)

Livestock

Livestock is an important resource for the region. The species generally kept are small, while cattle are owned by the better off. The most common animals are poultry, sheep, goats and – in the last decade – pigs. Between 1986 and 1996 the proportion of cattle, sheep and goats in the Northern Region and in the Upper East Region declined, while it increased in Upper West. However, over 70 percent of cattle population of the country live in the northern regions.

Households generally invest income in livestock in order to protect themselves from unexpected events. Sales of livestock are largely used to finance consumption or working capital for farming. They act as the principal 'rural savings banks'. Sales are usually made during the dry season, so livestock keepers obtain low values for their animals (Cepa and Odi, 2005). Cattle are not usually sold to meet cash obligations, but only when household needs for a large sum of money. Small ruminants and fowls are often sold to buy grains to supplement food stocks or to purchase personal effects (Dittoh, 2001).

Ghana is a livestock importer, so there would be considerable scope for enhanced livestock production, but the good comparative advantage has never been exploited. Poor livestock keepers have limited capacity to invest in the productivity of their livestock: the majority is kept extensively with low labour, they are generally not housed and feeding is free range. Health care is minimal and privatisation of veterinary services had led to a drop in demand for vaccination.

Poultry industry had a period of important growth due to the government interventions aimed to sustain the sector[34], started during the 1960s. The industry reached its peak in the late 1980s. But, even in this sector, the ERP policies had negative consequences: removal of support for feed mill ingredients and for the drugs - necessary to avoid animal diseases -, together to the freezing of the credit facilities, caused the sharp increase of the production costs. In addition to this, the government reduced the tariff rates for poultry, causing a 144 percent raise of the meat poultry imports between 1993 and 2003. Ghanaian market was invaded by cheap poultry coming from abroad, mainly from Europe, where the sector is heavily subsided[35]. More than 400,000 Ghanaian producers have been negatively affected by international competition: in 1992 they supplied 95 percent of the internal market, in 2005 only 11 percent. The imported chicken is sold at a price that is about half of the price of local chicken (Atarah, 2005).

Like in the case of rice, in 2003 Ghana Ministry of Finance increased the tariff on poultry meat from 20 to 45 percent, but under the threats of the IMF, the new tariff was not applied (Khor and Hormeku, 2006). However, the *National Poultry Farmer's Association* estimates that only a tariff of 80 percent – that would be within the WTO obligations - could allow them to compete with the imports from EU.

Main problems related to agriculture

Irrigation is a key factor for development: large amount of money have been spent on constructing small dams, but the majority of them have not been completed or are not functional. The biggest potential would be pumping irrigation water from the river systems of the north, since river water is abundant in some part of Northern Ghana, although it is largely unexploited for irrigation.

With regard to technologies, Northern Ghana has a long experience in both tractor mechanization and animal traction, but lack of liquidity is a major constraint and so the most demanded technologies are those not requiring purchasing inputs. Projects have difficulties in making inputs available on credit, because the record of repayment is very low.

Seasonal price variations represent an additional problem for farmers. Crop prices are higher during the dry season, when the necessity to rely to the market for the subsistence of the household increases and the food supply is minor. It would be convenient to store part of the harvest and wait the end of the farm season to sell it. But the lack of adequate storage systems does not permit such a strategy for most of the crops, so that farmers are often forced to sell the crops at very low prices.

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[34] For a story of the growth of the poultry sector, see Nhansah (2004)

[35] The parts that are sold in Africa are the ones the European consumers do not want, like legs, necks and wings.

Traditionally, extensive-shifting cultivation has been the most common strategy for rural households: it allows farmland to go through a period of fallow and an opportunity to improve its productivity (Mensah-Bonsu, 2003). Nowadays, like in all the Sub-Saharan Africa, the increasing growth of population puts pressure on farming land and, as a consequence, traditional methods of cultivation are progressively dropped in favour of new systems that are often not sustainable. Where there is abundance of labour if compared to land, farmers are more likely to adopt labour-intensive technology than capital intensive. This tendency is strengthened by the large cuts in credit, inputs and services occurred in those countries where adjustment policies have been implemented. Some authors observe that in the resource poor areas, where fertilizers could reduce the exhaustibility of soils, the labour led path to intensification conduces to land degradation and stagnation of land productivity (Mensah-Bonsu, 2003).
In Northern Ghana, this picture is worsened by the gradually deterioration of rainfall and the slightly increasing of temperatures: the rainy season starts later than before and rainfall variability is increasing. This means that even during the rainy season there could be periods of dry spells (Obeng, 2005).

3.4.2. Non farm activities

Relatively few households rely on non farm activities as their major income source, much less than for Ghana as a whole. The share of household income in the north deriving from wages and non-farm activities is significantly lower than Ghana's average.

Table 3.6. Persons aged 15 and above, distribution by branch of activity, regions

	Year	Northern (percentage)	Upper East (percentage)	Upper West (percentage)
Agriculture, Forestry, Fishing	*1997*	*66.24*	*73.9*	*74.5*
	2003	61.5	35.4	57.1
Mining, Quarrying	*1997*	0	0	0
	2003	0.1	2.4	0.3
Manufacturing	*1997*	*10.35*	*1.83*	*3.02*
	2003	5.6	9.1	10.3
Construction	*1997*	*1.4*	*0.62*	*0.52*
	2003	1.6	12	5.2
Transport, Storage	*1997*	*1.36*	0.46	*0.92*
	2003	1.5	2.3	1.7
Wholesale and retail trade	*1997*	*15.76*	*9.8*	*5.25*
	2003	20.7	22.4	14.8
Services (finance & insurance, Electricity gas & water, social services)	*1997*	*5.31*	*13.33*	*15.78*
	2003	9.1	16.4	10.8

Source: GSS (2000) and GSS (2005)

Notwithstanding, as it is evidenced in table 3.6, employment in sectors different from agriculture has increased, in particular in the Upper East Region, which is the region with more food insecurity: today agriculture is not the first sector of employment for a lot of household heads. Construction, manufacturing, wholesale and retail trade are the fastest-growing activities. Even subordinate employment, both regular and occasional, seems to be on the rise.
Large scale trade mainly consists in selling manufactured goods - coming from southern Ghana -, export of food crops from the Northern Region to Togo and Burkina Faso, and seasonal import of fruit, vegetable and some basic foodstuffs from other Sahelian countries. The poor system of transport is the major constraint for trade, and also checkpoints constitute other important limitations, since they represent a considerable informal tax burden for traders.
Moreover, Northern Ghana has recently become a transit zone: Mali and Burkina Faso have rerouted much of their exports through Tema, via Northern Ghana because of the conflicts in Ivory Cost. Northern Ghana could take advantage of this situation, by developing more services for transit trade. The realization of key roads to connect borders has started in the past, but then

remained uncompleted. It is the case, for example, of the connection through Upper West to the commercial area of Bobo Dialosso - in Burkina Faso - (CEPA and ODI, 2005).
Some of the craft products in Northern Ghana are valuable. Baskets were exported until around 2000, when competition from Vietnam's craft market placed out baskets and other handicrafts from the Upper East. Now the Ghanaian ones are not competitive on the international market. Some companies tried to develop a craft industry, but they faced the typical supply problem of the smallholder economy, where producers often do not comply with the contract because this activity represents only a survival strategy for them (CEPA and ODI, 2005).
Today a promising line could be to link handicraft to the expansion of tourism, which at present is almost negligible, despite the biggest natural reserve of the country, the *Mole Game Reserve,* is in the Northern Region. The number of visitors in the reserve is increasing, but the park and the connection network to the park are still underdeveloped. There would be other potential attractions over the region, but there are just a few accommodation facilities. Some NGOs are investing on eco-tourism.
A few households earn part of their income from small scale 'galamsey' mining especially in Upper East. But local men and women participate only at the bottom of this activity, carrying out the least skilled tasks. There are sites where there is potential for this sector, but it is slow to develop. There is an iron deposit near Yendi, to which American and Chinese were interested, but the Yendi crisis[36] put a constraint to this investment. There are areas with gold deposits - Dakrupe in Bole and some sites in the Upper East – but they have poor infrastructure.
Among the other non farm activities, charcoal is developing, since it is – together with wood – the major source of cooking. Urbanisation has greatly increased its market demand. Today even the 'economic trees', like sheanut trees, dawadawa[37], baobab and ebony are used for firewood.

3.4.3. Migration flows in the area

Since the beginning of the 20th century, northerners have travelled to the South during the dry season to work in agricultural jobs, returning in April or May. Most people move from North toward the food crop frontier in the 'middle belt' of the country. The forest areas of Ashanti, Brong-Ahafo, Eastern and Western Regions are the traditional migrants attracting zones. But the Greater Accra Region has progressively become the highest recipient of migrants. There is also a flow from the densely populated Upper East Region and western part of the Upper West to the sparsely populated parts of Northern Region and the eastern part of Upper West. Census data indicate that the Upper East and the Upper West Regions are areas of net out-migration; instead Northern Region is still a slightly net receiver of migrants (GSS, 2005a; GSS, 2005b; GSS, 2005c).
Van der Geest (2003) highlights that even more people turn to migration, mainly domestic, as a livelihood strategy. This trend is confirmed by the study of CEPA and ODI (2005) that shows that remittances represent a growing proportion of households' incomes. Moreover, GLSS data show that households' average percentage of income from remittances was 2.3 percent in 1991/92 and became 10 percent in 1998/99. The main increase has been in the Northern Region and in the Upper West Region. CWIQ data show that in these two regions only 23 percent of households declare to never receive any kind of support (in cash or in kind) from relatives during the year.
According to Abdulai (1999), the extension of the road network into rural areas decreased the cost of movement of people and improved information, so that migration became less risky and the chances to find a job improved.
Tutu (1995) reported that the larger parts of migrants are illiterate. More precisely, Abdulai observes that the direction of migration is influenced by education: more educated migrants

[36] During the 1990s, a number of conflicts broke out in the area, caused by land, religious or chieftaincy succession disputes. The impact of the conflicts on the region has been heavy: people died, some families were forced to move from their native area, livestock and crops have been destroyed and the generated insecurity discouraged the few local investors. The last important conflict has been the Yendi crisis. In March 2002 the king of Dagbon, Ya Na, was killed together with 30 other people, as the result of the dynastic rivalry between two branches of the royal family – the Andani and the Abudu -, that had been carried over the last century. For a complete story of the origins and the consequences of the crisis, see MacGaffey (2006).
[37] Dawadawa is harvested for its flour and seeds, that are used as a soup condiment, since they are very nutritious.

move toward the regional urban centres, while most of the illiterate migrants prefer to move to the mining and cocoa growing areas of the country.
Beals and Menezes (1970) argue that seasonal migration from the North to the South of the country is more efficient than permanent migration because the combined income from the farm in the North and from the seasonal stay in the South exceeds income from one of the two alternatives. The reluctance to break close ties with the family of origin is another explanation of seasonal migration, and also explains the high frequency of return migration (Tutu, 1995). Some migrants left the village also during the wet season: it occurs because the worsening conditions of farming in the departure area make no necessary that all the family members work on the household land (Mensah-Bonsu, 2003).
As a source of revenue, seasonal migration is often more important than livestock production and the sale of food crops. In the dry season, remittances are used to secure food needs. Mensah-Bonsu (2003) argues that also the flows of remittances from the household to the migrant are common, especially at the beginning of the migration experience.

Recently, the more exhaustive work on migration pattern has been conduced by Van der Geest (2003) and focus on migration from the Upper West Region toward Brong Ahalfo Region. He found that the main determinants of both permanent and seasonal migration are the lack of fertile land in the home area, the need to improve own standard of life and the willingness to help relatives. Generally it is not the head of the household who migrates, but young boys or girls. Many children also work as houseboys and house-girls in the South.
Cash transfers are not very high, but transfers in kind, like food and clothes, are significant. Also contributions for school fees and for funeral celebrations are consistent. In Northern Ghana little money from outside enters, so the inflow of money from seasonal migrants are one of the few cash flow of the local economy[38].
In drought years, households ask much more aid to their migrant relatives, being migration an important component of the strategies households adopt to deal with risk. This is confirmed by Obeng (2005), who finds a positive relationship between drought and mobility: migration is higher in bad rainfall years than in good ones.
Migrants with higher educational level generally remit the largest net amount and they are more likely to help their relatives to send children to school, both for altruistic reasons and because they hope their younger relatives will have salaried works and could help them in the future (Van der Geest, 2003).
According to Van der Geest, in his study area, non farm activities in the dry season would not seems a real alternative to migration, because they could not provide competitive returns to labour for enough people to abandon labour migration. So, at present conditions, "migration seems a very rational response to structural opportunities and constraints of the natural, economic and policy environment" (p.10).

3.4.4. Diversification and multi-activity as response strategies

An important matter in a region highly food insecure are the coping strategies that people adopt in case of temporary or permanent changes occurring in their livelihood context. We distinguish between the coping strategies adopted to face with temporary and sudden shocks and long term adapting strategies.
A number of field studies have been conduced in Northern Ghana in order to evidence the short period coping strategies used to face food shortages. Food scarcity requires the availability of cash to assure the food security of the household. Among the others, Dittoh (2001) found that the major sources of money for food purchases during times of shortages are sale of livestock,

[38] Migrants declare they prefer to invest in a good house in the North rather than in the destination area, since they consider their residence as temporary. According to Van der Geest, this could be seen as a productive investment because a healthy dwelling is a precondition for a productive life. Bicycles are another productive investment often made by migrants.

crops, or firewood and the remittances. Crop and livestock are sold also for funerals and festivals, for the education of children and for medical care[39].

On the other hand, some authors have tried to better understand how rural households respond – in the long term - to the increasing difficulties in the agricultural sector caused by the climate changes.
Obeng (2005) studied the impact of climate variability on geographical and occupational mobility in two districts of the Upper East Region. He found that almost all the households of the survey have experienced migration, in particular seasonal migration, and that migration – particularly young migration - is perceived to have increased.
Regarding non farm activities he argues that, despite it is not a new phenomenon in the region, nowadays it has a growing incidence in the livelihood of people. When population growth was not a problem and farming was a permanent source of income, people engaged in non farm activities not necessarily with profit reasons. In the past few decades, most households have entered into the sector because cash needs have increased, and non farm activities are practiced all over the year, especially by the rich. Their intensity increases in the dry season and in drought years.
On the other hand, Yeboah (2005) studied the impact of climate variability on the decision making process of small farmers in Bongo district. He tried to understand how coping strategies are now different from the strategies that were adopted in the 'olden days', referring to the time of the drought in 1983. The differences coming out from the study are the major propensity to use money from business instead of selling animals to buy the food in the market; the increasing number of people who temporally travel out of the area to work and who send remittances at home; the increasing number of woman involved in business activities and the lower dependence on wild fruits given the reduction of fruit trees.
These results are consistent with the ones of Dietz *et al.* (2004), who found that people are changing the composition of livelihood portfolios, by relying more on non agricultural sources of income and by changing their food production strategies to more drought adapting varieties of crops.
The work of Mensah-Bonsu (2003) investigates the linkages between land use issues, population density and soil degradation. From his field study in thirty villages in Northeast Ghana, an area where the population density is very high, he observes that it is more difficult in the recent years to acquire new farmlands, that the intensity of use of land is very high and that very few plots are uncultivated. The farmers confronted with important difficulties in the traditional agricultural sector usually explore other alternatives that may supplement or complement the farm production activity. Non farm work and migration are the most important available opportunities. In particular, Mensah-Bonsu considers migration of a member of the household as an efficient response because it reduces the pressures on the environment and on household's farm land, that may become more productive than it would be in absence of migration. Moreover, the flow of remittances, even if small, is able to improve household's position in terms of relative deprivation with respect to a specific reference group, generally the village.
Another strategy households can undertake to increase their income is cash crop growing[40]. In fact, estimated per capita income of cash crop growers is higher than non growing ones and they are less dependent on outside support - remittances and gifts. Cash crop farmers allocate more labour for farm, even during the dry season, while non-growers allocate more time to non farm activities. Cash crop growers have larger average resident size and their yields are generally higher if compared to food farmers. With the introduction of cash crops, money flows enter the local economy, damaging food crop farmers, for whom life became more expensive. Moreover, it induces over exploitation of land, because the farmed area necessarily expands.
Migration and cash crop cultivation are considered by the author as alternative strategies the household can choose to increase farm income and productivity. But they have opposite effects

[39] Other coping strategies, in times of shortages, are: reduction of feed intake by adults, increase in cassava proportion of the diet, selling of sheanuts and dawadawa to buy food, borrowing food from neighbours, eating more fruits and leafy vegetables, temporary migration to the South, hiring out of labour, selling charcoal and firewood, fishing along the rivers (Dittoh, 2001).
[40] Mensah considers cotton, groundnuts and onion as cash crop cultivation.

on the demand for farm land and on the environment. The alternatives are not mutually exclusive, but a combination of the two can be satisfactory for the household.

From the former studies, it emerges a tendency toward income source diversification and toward an higher degree of multi-activity, that is – as we saw in section 2.6 – a typical phenomenon of Sub-Saharan countries.
Yaro (2006) studied multi-activity in Kassena District in the Upper East Region through a field study. He argues that diversification is a necessary part of rural population life because income from agriculture in many poor households is on decline, while general expenditure is on the rise. The hope for new opportunities in the non farm employment is the aspiration of many families, who invest in the acquisitions of skills through education and job training. 'Diversifying' households account for over 60 percent of the sample, while the rest of the households have only one income source for several reasons: lack of capital, low profitability, time constraints or satisfaction with main income source.
Multi-activity is higher among the middle income earners because the poor have not resources and the rich have sufficient resources from agriculture and related activities. Most households who earn their main income from non farm activities also diversify, especially in livestock or in specific crops such rice or groundnuts, as an ex ante insurance mechanism against food insecurity. Formal sector employees, business people and pensioners also diversify into farm activities as a secondary activity.
According to Yaro, the main reasons why people diversify their income generating activities are the declining farm output - caused by erratic rainfall and declining soil fertility - and the need to raise more income to face the increasing expenditures, resulting from government deregulation policies.
On farm diversification is widespread: peasants habitually change crops and adapt their farming practices in response to macroeconomic, environmental and social shocks[41].
From recent time in the dry season most households are occupied in non farm activities: natural resource-based activities (i.e. fuel wood cutting, charcoal burning, gathering of wild fruits) formed the main refuge for poorer households that do not find niches in trading and employment.
Incomes from non farm activities are generally low, and in terms of contribution to household income and livelihood security the farm sector still made the highest input. Even so, non farm activities incomes are constant and essential for households to survive.
In his conclusions, Yaro states that in Northern Ghana there is not a process of 'deagrarianisation' but rather a process of multiplex livelihood adaptation and that diversification per se does not automatically generate livelihood security.

3.5. Conclusions

Krugman and Venables (1995 and 1996) argue that lowering trade barriers causes greater inequality and agglomeration initially, but at a later stage also the poorest areas benefit from the reduction of trade and transport costs. We showed that, after more than twenty years of adjustment and free trade policies, Northern Ghana is still waiting to receive the supposed gains.
In this chapter we illustrated the most important changes occurred over the past decades in the economic, institutional and environmental context of Northern Ghana, connecting them to the development of the economic conditions of the country as a whole.
Northern Ghana economy is mainly based on subsistence agriculture; relatively few households rely on non farm activities as their major income source, if compared with the rest of the country. The large majority of people is self employed and works in the private informal sector. CWIQ data indicate that - between 1997 and 2003 - the percentage of people engaged in agriculture clearly decreased to the advantage of the non farm activities; at the same time also the share of

[41] Examples of first responses to hard times are reducing fertilizers, single wedding regimes, using more family labour, early harvesting before crops reach maturity. Deeper households' coping trajectories are: expanding income, reducing expenditure, increasing asset sales and migrating.

household income derived from remittances increased. These changes in the household income source composition reflect deep changes occurred in the macro context.
In fact, a process of desertification is occurring in the study area, implying increasing difficulties for the agricultural activity; the public funds allocated to large scale development projects have been cut back; the increased competition from foreign producers damaged the main cash crops of the area (e.g. rice, cotton, tomatoes) and a rich array of small-scale – almost invariably uncoordinated - development projects have been implemented by NGOs with the financial support of the international institutions.
This dissertation aim at drawing an explicit link between the macro and the micro levels, trying to understand how these macro changes influenced the livelihood of the people living in the rural areas of Northern Ghana. We intend going in depth on the analysis of the long term adaptive strategies adopted in the last decades in Northern Ghana. The studies we presented in section 3.8 started to analyse the impact of climate changes on the livelihood of rural population; we move from their findings, exploring also the consequences of the changes occurred in the institutional and economic framework.

4. Changes in livelihood strategies in Northern Ghana: a qualitative assessment

4.1. Methodology of the field study

4.1.1. Operationalizing the livelihood approach

The livelihood approach has been actively promoted by the UK Department for International Development, as it "provides a way to improve the identification, appraisal, implementation and evaluation of development programmes so that they better address the priorities of people" (DFID, 2001). This approach shifts the focus from the output of a project to the people that are involved in the project itself, and it calls for a proper understanding of their own priorities; this requires the adoption of a broader focus, that includes an analysis of the macro-micro linkages.
The DFID decided to adopt the Sustainable Livelihood framework as the main theoretical basis of its interventions, as a 'way of structuring ideas' at the time of project design. Such a choice broadens the informational basis – and the ensuing need of resources – that is required to draft concrete interventions, compared to conventional procedures used by development agencies. Still, it is fair to acknowledge that this framework is only partially implemented in most of the cases, picking just the components that are more closely connected to the specific objective of the project, and disregarding the rest. When the core of the project is, say, the construction or up-grading of a road, the focus will be not the "product of the road", but "how roads and road building affect the people who live nearby and who might eventually use them as part of their livelihood strategies", so the livelihood analysis will not move beyond an assessment of the direct implications of the road construction (DFID, 2001).
Instead, a full implementation of the livelihood approach represents an analytical tool that is able to provide a researcher with a unified, comprehensive picture of the complexity of rural context of interest. This approach permits – and actually it requires - to intertwine a number of usually self-contained and hardly communicating fields related to rural development. Households coping and risk-management strategies, rural non farm activities, migration, poverty are all aspects that need to be jointly considered, and their mutual influences adequately analyzed, and this represents a distinct advantage of this framework of analysis. The livelihood framework represents a useful analytical tool to systematize the vast amount of available data and information once it is used as a theoretical guidance, and not just as a tool-box for designing development interventions.

4.1.2. Methodologies for the analysis of livelihoods

It is not easy to gather detailed information about rural livelihoods, as the interrelations between assets, strategies and outputs are complex, and it is important that the process of data collection preserves these rich interactions, avoiding undue simplifications. Participatory methods – e.g. focus group discussions, interviews with key informers, mixed community meetings - are the most common methodologies used for this purpose (Chambers, 1997). Rapid rural appraisal methods were introduced with the purpose of a quick data collection meant to improve project design and implementation, as questionnaire surveys were excessively time- and resource-consuming for this purpose. These methods were developed with the inclusion of new field techniques, with the scope of involving people in determining their own priorities for projects and policies, and they were labeled as *Participatory Rural Appraisal*, PRA.[1]
PRA methods have the merit to have broken the tight structure of questionnaire-based interviews, introducing semi-structured interviews, where the interviewer follows an outline containing the information he wants to collect, and just introduces the arguments, letting people free to express their views and perceptions about them. One of the strength of these methods is

[1] Chambers (1994) described the PRA as "a growing family of approaches and methods to enable local people to share, enhance and analyze their knowledge of life and conditions, to plan, act, monitor and evaluate".

that they adopt a bottom-up approach: the role of the researcher is only to facilitate people to express their ideas and opinions, and to identify the main problems they have to face as well as possible solutions. These aspects are particularly useful in project design.
Ellis (2000) identifies some typical problems of focus group discussions and village meetings that need to be addressed and solved in the design of a field study, as the picture of the community emerging from the focus group discussion can be biased for various reasons. The researcher should prevent the exclusion of any social group; moreover, he needs to be aware of norms and conventions that do not allow some community members to express their opinions; finally it is possible that a general discussion may hide - or at least fail to disclose - differences and cleavages across social groups.
Group meetings are the most suitable methods to identify the main economic activities - including migration patterns - in which the community is involved, their characteristics, the problems and risks related to them, their profitability, and their contribution to food security.
The collection of relevant secondary data on the sample communities often represents a necessary first step[2], including information on the historical and political background, prevailing economic activities and access to market, agro-climatic characteristics, infrastructures, social services, governmental or donors' interventions and programs. As this information may not be available from secondary sources, interviews to local key informers represent an important complementary source of information.
The joint – and at times contrasting - picture provided by secondary sources, key informers and group meetings should identify the extent to which specific groups are exposed to particular trends or shocks or seasonality risk, and which is their resilience ability.
Usual questionnaire-based surveys remain the best instrument to collect information about households; in this case, sample selection is often driven by a preliminary clustering of the target population according to some socio-economic indicators. This is based on information provided by local people, and so it indirectly helps to understand their conception of well-being. Generally the researcher asks to a group of people from the community to break down the households in three or more sub-groups, on the basis of their income level, or perceived well-being. Then, a given number of households is randomly drawn from each group, so that the sample is representative of the income groups, and it is possible to realize comparisons across income levels[3] (Kumar, 2002).
The opportunity to realize a survey has to be thoroughly considered. Sample surveys are good at capturing detailed income data and they allow to make comparisons among different groups, but some information about incomes can also be obtained from a group discussion concerning economic activities.[4] Furthermore, it is preferable to avoid unduly lengthy questionnaires, and this requires a careful definition of its core content[5].

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[2] The Chronic Poverty Research Center published a *livelihood checklist*, i.e. a list of the useful data for compiling a livelihood framework; see the web site www.chronicpoverty.org.
[3] Ellis (2000) describes an investigation of rural livelihood strategies through a field study in three Tanzanian villages, where he used an approach that combined participatory methods with a small-scale survey. The three main components of the research are a semi-structured focus group discussion in each village, a participatory wealth-ranking exercise and a sample survey collecting demographic data, information of land, farm and non farm income data, household assets and remittances. The scope of the focus group discussion is to discover the vulnerability context, while the small sample survey is aimed at examining more concretely which are the assets and the activities of the households and how the poor differ from the rest of the community in these respects.
[4] Through a focus group discussion one can gather information about migrant members, and about the kind of jobs they are employed in, or about the permanent or seasonal character of the prevailing economic activities, though there is the risk that less common sources of income - like pensions, rental income may be ignored in the focus group (IFAD, 2001).
[5] An interesting example of questionnaire is the one used in the LADDER project. Such a questionnaire allows to collect all the information required to map household income sources, and the evolution over time of the activities they are engaged in. This latter information is derived from a series of open questions about the differences - if any - observed over the previous five years; specific questions on farm and non farm activities, the availability of cultivable land, and the reasons why the pattern of activities changed. The brief household questionnaire provides information about asset ownership, and Ellis (2000) proposes a simple way to synthesize by means of a graph - reproduced in figure 2.2 - the multidimensional information about household assets, and the shapes of the pentagon provide an intuitive assessment of the differences in the access to the five types of capital across specific groups (see section 2.1).

4.1.3. Methodological approach used in the field study

The main purpose of our field study is to understand the livelihood patterns of the rural population in Northern Ghana since the late 1980s.
Budget considerations represented a binding constraint upon analytical choices, so that cost-effectiveness and timeliness represented important factors in influencing our decisions.
We carried out our field work between April and June 2007 in eight randomly selected communities located in five districts of northern regions of Ghana. The selection of the sample districts was based on a cluster analysis carried out by WFP (2004). In order to test our basic assumptions that households located in the same cluster have similar livelihood assets, we carried out a further cluster analysis based on data from the *Core Welfare Indicators Questionnaire* survey (CWIQ), realized by the Ghanaian National Statistical Office.
The main research hypothesis (cf. chapter 3) is that livelihood strategies have been evolving towards a greater degree of diversification. We adopted a mixed methodology to test this hypothesis that includes the analysis of secondary data as well as techniques drawn from the livelihood approach, as focus group discussions and interviews to key informers[6].
The interview to the key informer - generally the assembly man[7] - aimed at collecting basic information on the community, to understand whether the randomly selected community resembled the district information drawn from secondary sources. The semi-structured group discussions focused on the changes and trends over the last 15-20 years in five main areas of livelihood: agriculture (and service to agriculture), non farm activities, migration, land and natural resources, perception on changes in community well being. We decided to conduct two separate, gender-specific, focus group discussions in each community, because of the reluctance that most women have in expressing their feelings in the presence of men, and to allow for the emergence of gender differences about the judgments of the main changes occurred within the community. Annexes 1 and 2 report the trace of the interview with the key informers and the guideline for the focus groups discussions respectively.

4.2. Selection of the sample communities

The *District profile* and the *Medium Terms Development Plans* are interesting documents, produced by the local District Assemblies, that provide an in-depth analysis of the situation of each district, as a basis to plan future interventions. The Ministry of Forestry and Agriculture (MOFA) district offices publish every year an *Agriculture Profile* of local district. Census documents contain information on access to services at a community level. All these documents have been extremely useful to gain a better understanding of the characteristics of each districts. Moreover, they provided evidence that the districts represent rather homogeneous areas according to several key features, ranging from climatic conditions, soil characteristics and land tenure systems, to the prevailing demographic structure, health, water and sanitation conditions, education and sectoral distribution of workforce. This homogeneity implies that the information obtained in a specific community can be regarded as informative of the changes in livelihood strategies occurred in the whole district. This in turns leads to the hypothesis that the context has a strong influence on livelihoods strategies, so that the homogeneity within each district should map into a close similarity in livelihood patters.

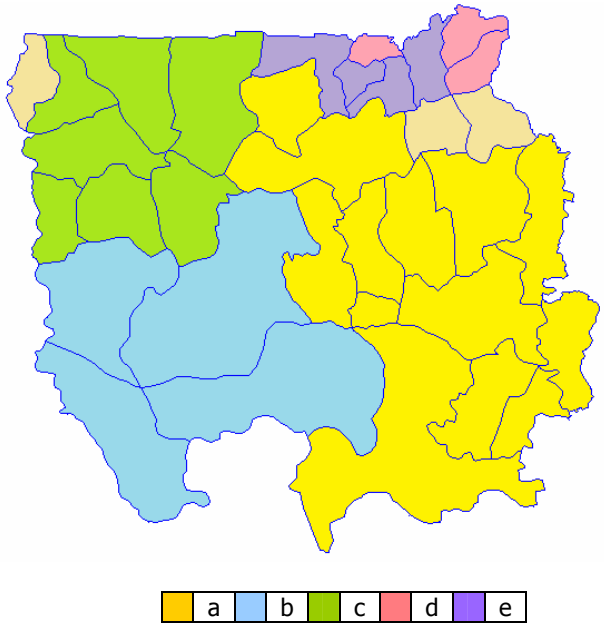
4.2.1. World Food Program Clustering

The whole Northern Ghana is covered by savannah, and the districts do not significantly differ with respect to the main agricultural crops. Nonetheless, there are some key factors that vary a lot across the three regions. Population density represents a notable example of this variability,

[6] Budget constraints prevented us from conducting interviews with a sample of households in each community.
[7] The assembly man is the individual who is elected by the people living in the area to represent them in the District Assembly.

as the Northern Region is sparsely populated, while some of the districts of the Upper East Region are characterized by a very high population density.
According to World Food Program (Dittoh *et al*, 2004), WFP henceforth, other two variables, namely elevation and ground cover, should be considered in order to divide the Ghanaian territory into homogeneous areas. Regarding ground cover, there is a lot of mixed ground cover in the Southern and North-Western part of the country, while the Central and the North-Central is mainly tree cover. The highest concentration of agricultural cultivation is found in the North-Eastern part.
WFP derived nine homogeneous clusters of Ghana districts based on these three variables using spatial analysis and principal components analysis techniques[8]; if we focus on Northern Ghana alone, the analysis by WFP identifies five distinct clusters of district, that are shown in figure 4.1.

Figure 4.1. District clusters based on WFP multivariate analysis



Source: World Food Program (2004)

The five clusters are described by the WFP as follows:
a. Lower lands with natural vegetation and low population density, that characterize the Eastern part of the Northern Region and the Builsa district in the Upper East Region.
b. Mainly tree cover with low population density, western Northern region;
c. Higher lands with natural vegetation and mixtures of crops and low population density, in the whole Upper West Region;
d. Cultivated land combined with high population density in Bongo and Bawku East districts in the Upper East Region;
e. Lower land, mixture of natural vegetation and crop lands and high population in the remaining part of the Upper East Region.

We have randomly selected one district in each of the five clusters identified by WFP. The selected five districts are: the Savelugu-Nanton district, that is close to Tamale, the capital of Northern Region; the West Gonja district in the western part of the Northern Region, within the major Ghanaian conservation park; the Jirapa-Lambusse district in the Upper West Region, at the border with Ivory Cost and Burkina Faso; the Bongo district and the Talensi-Nabdam, with the latter being a newly-created district, when the former Bolgatanga district was been divided into Bolga Municipality and Talensi-Nabdam district in 2004. Table 4.1 summarises some of the salient features of the districts.

[8] These clusters do not necessarily coincide with either regional or administrative boundaries.

Table 4.1. Salient features of selected districts

	West Gonja	**Talensi Nabdam**	**Jirapa Lamboussie**	**Bongo**	**Savelugu Nanton**
Ethnicity	The district is characterized by a ethnic fragmentation: 22 ethic groups live in the district	Almost the whole population is Dagbani (Frafra)	The majority of people belong to the Dagaare ethnic group, while a consistent minority are Sissala	Almost the whole population is Dagbani (frafra).	More than 90 percent of population is Dagomba
Religion	Muslim represent more than 70 percent of district population	Traditional religions are followed by more than half of the population, while the rest are Christians. Muslims represents only a small minority	Almost the half of population are Christians, about 10 percent are Muslims, with the others believing in traditional religions	More than 50 percent of population follows a traditional local religion, 35 percent are Christians, and only a minority are Muslims	Almost all are Muslim
Population density	Population density is 7.9 person per squared km[9]. The rural one is 6.79. The population growth in the district is higher than the regional average, being around 3.1 percent per year	Population density, according to the estimates by the District Assembly, stands 110.6 people per squared km	Population density is about 58 person per squared km. The rural one is 50	The district has an high population density: 183 person per squared km. The population growth rate is high (2.8 percent per year) and increasing	Population density is about 40.9 people per squared km. The rural one is 26.2.
Number and nature of settlements	There are about 400 settlements in the district. The 10 major settlements host over 42 percent of the district population	Roughly 190 communities belong to this new district, and only a few of them have more than 2,000 inhabitants.	There are about 200 settlements of varying size, most of them are small and dispersed in rural area. 13.7 percent of people live in urban areas. The only town is Jirapa, but other six settlements will soon become large enough to be identified as towns	There are 185 settlements in the district. Bongo town hosts approximately the 18 percent of the entire district population. There are other four relatively large settlements, while the rest of the population resides in small and remote rural settlements	The district includes approximately 150 communities, and only six of them are urban (where 36% of population live)
Accessibility	The population is concentrated in a few accessible areas, while all the northern part of the district is often inaccessible, especially during the rainy season	The district takes up a relatively small area and only a minor part is well connected to Bolgatanga through dirt roads.	The road network is quite good, there have been improvement in accessibility since 1997, so that now most of the communities are connected by roads	Many communities in the district are not accessible or cut off during the rainy season. There are several unabridged streams	The communities near the main road connecting Tamale to Bolgatanga are the easier to reach.

Sources: GSS (2005a), GSS (2005b), GSS (2005c), Savelugu Nanton D.A. (2006), Talensi Nabdam D.A. (2006), West Gonja D.A (2006), Bongo D.A. (2006), Jirapa Lamboussie D.A. (2007).

[9] Urban population density in West Gonja decreased from 18 percent in 1984 to 14.5 percent in 2000, mainly because of the ethnic conflicts in 1990 (clashes between Gonja and Nawunis) and 1996 (clashes between Dagombas and Kokombas) that caused the devastation of several settlements and the exodus of thousands of people outside the district boundaries.

Although the districts belonging to the same cluster are more similar with respect to the asset portfolio households have access to and to the difficulties and hardships they are faced with, we do not claim that this sampling procedure enables the inference to the larger population the communities are drawn from. Yet, we deem that such a sampling is better suited than a completely random procedure to provide evidence on livelihood patterns in Northern Ghana.
Two communities within each district have been randomly selected, except for Bongo and Talensi-Nabdam, where we had the chance to visit only one community.

Box 1. Trend of main crops in the selected districts

The data from the Ministry of Agriculture (MofA, 2007a,b,c) show the evolution of cropped area and of productivity for the main crops of each district between 1991-2 and 2006. Maize, sorghum, millet, rice – some of the traditional crops – either declined or stagnated, while the production of groundnuts, yam, cassava and of some newly introduced crops, as cowpeas and soybeans, increased markedly.
Jirapa data show that the area cultivated in maize, sorghum and millet dropped for the benefit of the groundnuts. Here, and more specifically in Lamboussie, the production of maize was so high that it sufficed to meet the demand of the whole region. But, because of the raise in the prices of the inputs required to sustain high yields, the farmers had to give up - following the recommendations of the extension officers – the cultivation of this crop, that was replaced by seeds, as cowpeas and groundnuts, that were less reliant on fertilizers.

4.2.2. District clustering

Using WFP (2004) to select the sample districts, we explicitly supposed that households located in the same cluster have similar livelihood assets. In this paragraph, we verify this hypothesis, carrying out a further cluster analysis based on CWIQ data. The CWIQ is a quick survey, that has been designed to reduce the time and resources necessary to collect data for poverty analysis. Such a survey has been undertaken in Ghana in 1997 and in 2003. The short time that is required to administer the questionnaire allows to enlarge the sample dimension beyond the level of household budget surveys: over 49,000 households have been interviewed in each of the two rounds of the CWIQ, so that data are representative at the district level. Unfortunately, the CWIQ provides limited data on employment and on migration, but it contains enough information on households' assets.
We took a set of variables from the CWIQ 2003 as proxies for the endowments of several kind of assets: we used the size of the agricultural land and the access to water source as a proxy of natural capital; the average number of livestock as a measure of financial capital – as this represents a relevant storage of wealth in the rural context of Northern Ghana; household size, the access to schools and to the health centers as a measure of human capital; and, finally, we took the share of households who are connected to the power grid, to food markets, to telecommunication services and to public transportation as measures of physical capital.
As a first step, we computed, for each variable, the variance between WFP clusters. The ratio between WFP clusters variance over total variance[10] (last data column of table 4.1.) is high for household size and the size of farmed land, while the WFP classification captures only a limited part of the total variance of the variables measuring the access to the main services, with the exception of access to schools.
Admittedly, the cluster analysis in WFP did not include any information on the remoteness of the districts - and of the communities within the districts. These additional relevant aspect could be captured by some of the variables contained in the CWIQ that signal the access to basic services. Therefore, we selected four questions – i.e. access to a water source, primary schools, food market and telecommunication centres - out of the set that provides information about the remoteness of the rural areas, and we built a variable that measures the share of the population without access to the respective infrastructure in less than half an hour walk.

[10] For each variable, between we computed the between-cluster variance attributing to each district the cluster-specific average of the variable; then, we took the ratio of this variance over the total variance, and this ratio can be regarded as a yardstick of the accuracy of the cluster analysis: the higher this ratio, the more homogeneous are the districts within each cluster, and the more diverse across clusters (Sadocchi, 1981)

Table 4.1. Cluster analysis

		1		2		3		4		5			
	Districts	Tamale		Bolgatanga, East Mamprusi, Kassena, Nandowli, Sissala, Wa, West Gonja, West Mamprusi		Chereponi,East Damongo, East Gonja, Gushiegu, Nanumba, Zabzugu		Savelugu, Tolon		Bawku East, Bawku West, Bole, Bongo, Builsa, Jirapa, Lawra		Between group variances over total variance	Between DIttoh *et al.* (2004) group variance over total variance
Variables used in the cluster analysis		mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.		
Access to water source	percent	28.83	-	10.33	5.21	42.65	4.89	14.62	0.48	11.92	7.14	87.8	31.4
Access to nearest food market	percent	68.97	-	61.44	8.47	71.12	10.07	66.22	1.08	78.94	4.57	51.0	13.5
Access to primary school	percent	23.72	-	28.52	8.17	25.7	10.45	4.97	2.01	45.64	9.67	66.4	40.2
Access to a telecom. Centre	percent	59.38	-	89.77	5.06	96.11	2.89	66.09	0.93	93.39	5.88	84.7	35.2
Additional variables													
Access to nearest public transportation	percent	36.91	-	53.71	10.21	65.38	13.84	24.91	3.95	74.78	10.98	67.4	16.6
Access to secondary school	percent	64.76	-	92.19	5.55	96.75	1.88	80.66	9.25	94.63	4.1	73.8	54.7
Access to health centre	percent	67.17	-	73.02	7.04	84.01	4.95	54.49	3.77	82.38	6.65	69.8	8.4
Electricity	percent	12.4	-	5.51	3.59	6.7	6.05	5.36	1.44	4.16	2.82	17.4	18.6
Household size		4.81	-	5.18	0.7	6.91	0.8	6.07	0.68	5.03	0.52	63.2	68.0
Size of land farmed,	hect.	2.01	-	2.57	1.03	4.4	1.72	3.36	0.96	2.25	0.69	41.5	41.0
Number of cattle and other large livestock		1.69	-	2.19	0.8	2.86	0.99	4.18	0.53	1.98	0.89	40.3	31.3
Average number of medium sized animals		5.7	-	4.9	1.24	5.79	1.69	8.83	1.05	6.33	2.21	32.4	18.7
Population density, national		408.2	-	51.9	49.5	28.43	9.19	48.01	10.06	85.71	60.59	76.6	95.0
Urban share of district population	percent	66	-	17.34	10.65	20	9.06	25.5	14.85	12.7	14.96	48.4	45.4

Note: clusters have been obtained with *k-means* clustering, with Euclidean distance and initial centroids defined by the author; the variables referred to the access signal the share of the population without access to the respective infrastructure within a 30 minutes time. Data source: GSS (2005)

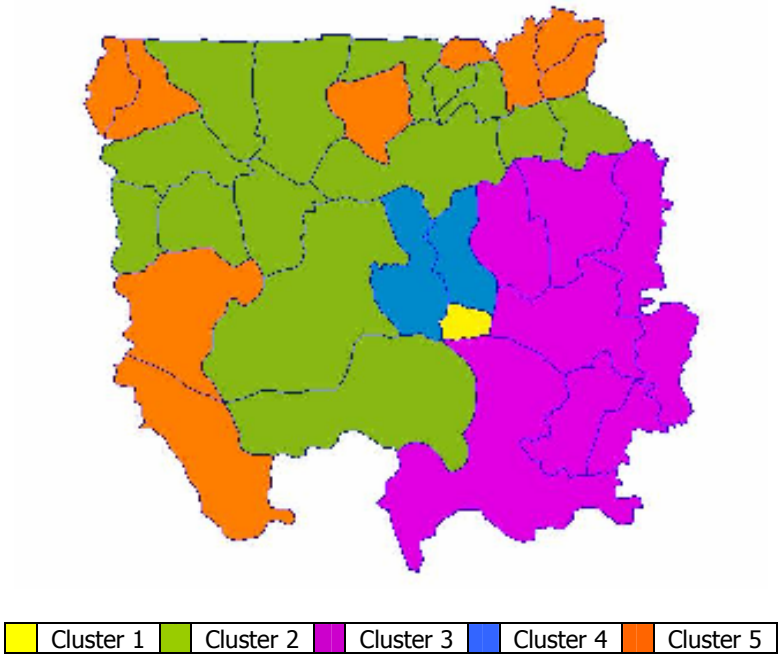
We used only these four variables in the cluster analysis to limit the problems induced by the standardization of non comparable variables, as this would have determined the loss of relevant information[11]. These four specific variables were chosen as the correlation matrix showed that they were not correlated each other, so that they were able to convey nearly-independent information. The clusters were then obtained with the *k-means* clustering technique, using Euclidean distance to measure the proximity of the districts[12].

[11] Table 4.1 contains information also on 10 additional variables, to verify to what extent our clusters are able to capture their variability.

[12] The *k-means* method is a non hierarchical clustering algorithm, that associates each individual to the nearest cluster, after the researcher has defined the number *k* of the final clusters and the initial *k* centroids from which the algorithm begins its minimization process (the 5 centroids where Tamale, Zabzugu, Bongo, West Gonja and Savelugu Nanton).

Table 4.1 reports the detailed results of the cluster analysis, besides information about additional variables, while figure 4.2 provides the map of Northern Ghana with the clusters identified by our analysis. It is straightforward that there are some relevant differences between this map and the one from WFP reported in figure 4.1, and that the compactness of the clusters is well preserved. This supports the intuition that geographical proximity is important in explaining the similarity in assets portfolio across districts. The results of the cluster analysis proved to be fairly robust with respect to an alternative selection of the underlying variables and to the number of clusters, or to the adoption of a different clustering algorithm[13].

Figure 4.2. District clusters



Source: author's elaboration on CWIQ 2003 data

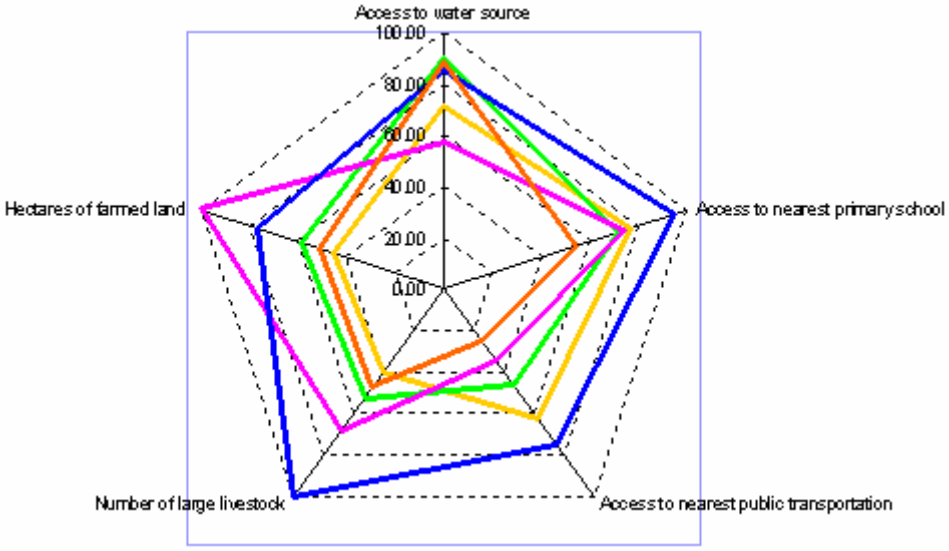
The sensitivity tests that we conducted to assess the robustness of this clustering suggested that some districts are more 'stable', while others are less similar to the cluster they belong to and tend to move to other clusters. Cluster no.3 and 4 proved to be the most stable, as their respective districts share some characteristics that notably differ from all other districts: the good access to primary schools for cluster no.3, and the lack of access to potable water for cluster no.4.
Tamale, the only district included in cluster no.1, shares some features with the districts of cluster no.4, but the significant difference in the access to primary schools makes extremely unstable its inclusion in that group. Some of the districts included in clusters no.5 and 2 proved to be somewhat unstable; nevertheless, each of them is formed by a 'core', including Bolgatanga, Kassena-Nankana, Nandowli, Sissala, Wa and West Maprusi for the cluster no.2 and Bawku East, Bawku West, Bole, Bongo for cluster no.5, that never moved to a different cluster.

The clusters resulted from our analysis and reported in figure 4.2 can explain quite well the differences among districts with respect to the additional variables reported in table 4.1,

[13] To provide just an example, when one substitutes the variable measuring the access to the secondary school for the one measuring the access to telecommunication centre, the only change that we observe is East Mamprusi moving to the fourth cluster.
If we want to obtain six groups, adding Lawra as a new centre, the only change is that East Maprusi and Lawra form a new cluster. Instead, if we try to construct four groups, removing West Gonja as a centre, it moves to group 4 and groups 2 and 5 form a larger group. To have 4 groups, dropping Tamale as a centre, it moves with Savelugu and Tolon, who are the districts the more similar to it.
Moreover, we tried to obtain five groups changing two of the five centers: we took East Maprusi and Banku East instead of Bongo and West Gonja. The result was that Builsa, Jirapa and Lawra moved to group number 2.

particularly those referring to assets endowment, household size, population density and – to a lesser extent - also the variables on land and livestock.
Population density[14] is negatively correlated with household size, and – more interestingly – it is similarly negatively related with the hectares of farmed land and with the number of livestock: the higher the demographic pressure, the more scarce the land available for farming – for rearing livestock. This is consistent with Songstore's findings (2003)[15].
There is not a strong correlation between access to services and population density, but we found a positive relationship between the share of urban population living in the district and the availability of infrastructure, especially health care centers, secondary schools and telecommunication services.[16]
To wrap up, one could argue that our analysis evidences the existence of significant differences among districts with respect to the resources people have an access to. This finding can also be represented by means of the same graphical instrument introduced by Ellis (2000).

Figure 4.3. Main assets of rural population by clusters



Note: The variables referred to the access signal the share of the population with access to the respective infrastructure within a 30 minutes time walk. In order to make the figure as clear as possible, the variables referred to land and to livestock have been standardized, setting their respective maximum values to 100, and rescaling the other values accordingly; data source: GSS, 2005.

In figure 4.3 we report five of the most relevant assets for the livelihood strategies of rural population in Northern Ghana, and we compare the asset portfolios of the five clusters. These assets are access to a potable water source and hectares of farmed land as two proxies for

[14] The high standard deviations of population density for cluster no.2 and no.5 reflect a notable heterogeneity of the two clusters: cluster no.2 includes two districts, West Gonja and Sissala, with the lowest population density in all Northern Ghana (8 and 12 people per squared km), and Bolgatanga, that has a density of 155 people per squared km; similarly, cluster no.5 includes Bongo, with 183 people per square km, and Bole, where the corresponding figure falls to 12.
[15] Songstore identifies three land management regimes in Northern Ghana: where population density is below 10 persons per squared km, the dominant system is bush farm with supplementary compound farms and unlimited commons (Northern Region, outside the boundaries of large settlements, and the Eastern part of Upper West Region); where population density ranges between 10 and 50 persons per squared km, the prevailing land management system is the same, but the communal land tenure disappears and the fallow is limited (the rest of Northern Region and Upper West, with the exception of Lawra district, and Builsa in the Upper East). In the rest of Northern Ghana, where population density is higher than 50 persons per squared km, compound farms prevail, and there is the introduction of private property rights on land, and there is the complete disappearance of the village commons in fallows.
[16] The unique exception is cluster no.2, where a fairly good access to services is matched by a low share of urban population.

natural capital, the average number of livestock as a measure of financial capital, the access to primary school as a measure of human capital and the access to public transport as a measure of physical capital.
Cluster no.4 has got the best assets portfolio: the only value that is on the average is the access to potable water sources. The cluster of Tamale has poor assets connected to the farm activities, probably because it is a very densely populated semi-urban area, where the physical assets necessary to the non farmed activities are quite good (as indicated, for example, from the good access to public transportation). Districts belonging to the cluster no.4 are among the worst with respect to access to services, but they show very good indicators about land and livestock, so that one can safely argue they are quite isolated, and that the population is much more dependent on agriculture. The assets portfolio of cluster no.5 appears to be the poorest one, with the unique exception of access to potable water sources. Finally, cluster no.2 shows values in line with sample averages for all the assets and has a particularly good access to the potable water, so that we can argue that its districts are, broadly speaking, representative of the average endowment of assets in the region.
Thus, the cluster analysis strengthens the argument that asset endowments is not adequately captured by the few variables employed by WFP, so that it is necessary to integrate that information in order to identify similar areas with similar assets portfolios.
Going back to our field work, it is important to recall that the selection of the sample districts was based on the WFP classification, and only once we visited the rural communities we realized that some key elements were not well captured by the WFP, and we decided to carried out the cluster analysis we just discussed. Thus, just three out of the five clusters that we later identified had been covered in the field work. Two of our sample districts – namely West Gonja and Talensi Nabdam - belong to cluster no.2, and two – Jirapa and Bongo - are part of cluster no.5. In both cases, the districts are not contiguous, and they show different levels of population density – and this is especially true for cluster no.2 as we already discussed. The fifth sampled district is Savelugu, and it belongs to cluster no.4. What we regret is the lack of any district from cluster no.3, as this appears to display some characteristics that are not found in other districts, while we maintain that our sample is adequate to represent the various assets portfolios in the rest of Northern Ghana.

4.3. An introduction to the field study communities

The map in figure 4.4 shows the selected communities and the districts they belong to. As it can be observed from the map, the districts - and the communities - we selected are scattered in Northern Ghana. The communities are Namoo in the Talensi Nabdam district; Lungu Dabotin, in the Bongo district; Willing and Die, in the Jirapa district; Sori No. 2 and Busunu in the West Gonja district; and Sugutampia and Yilipani in the Savelugu Nanton district.

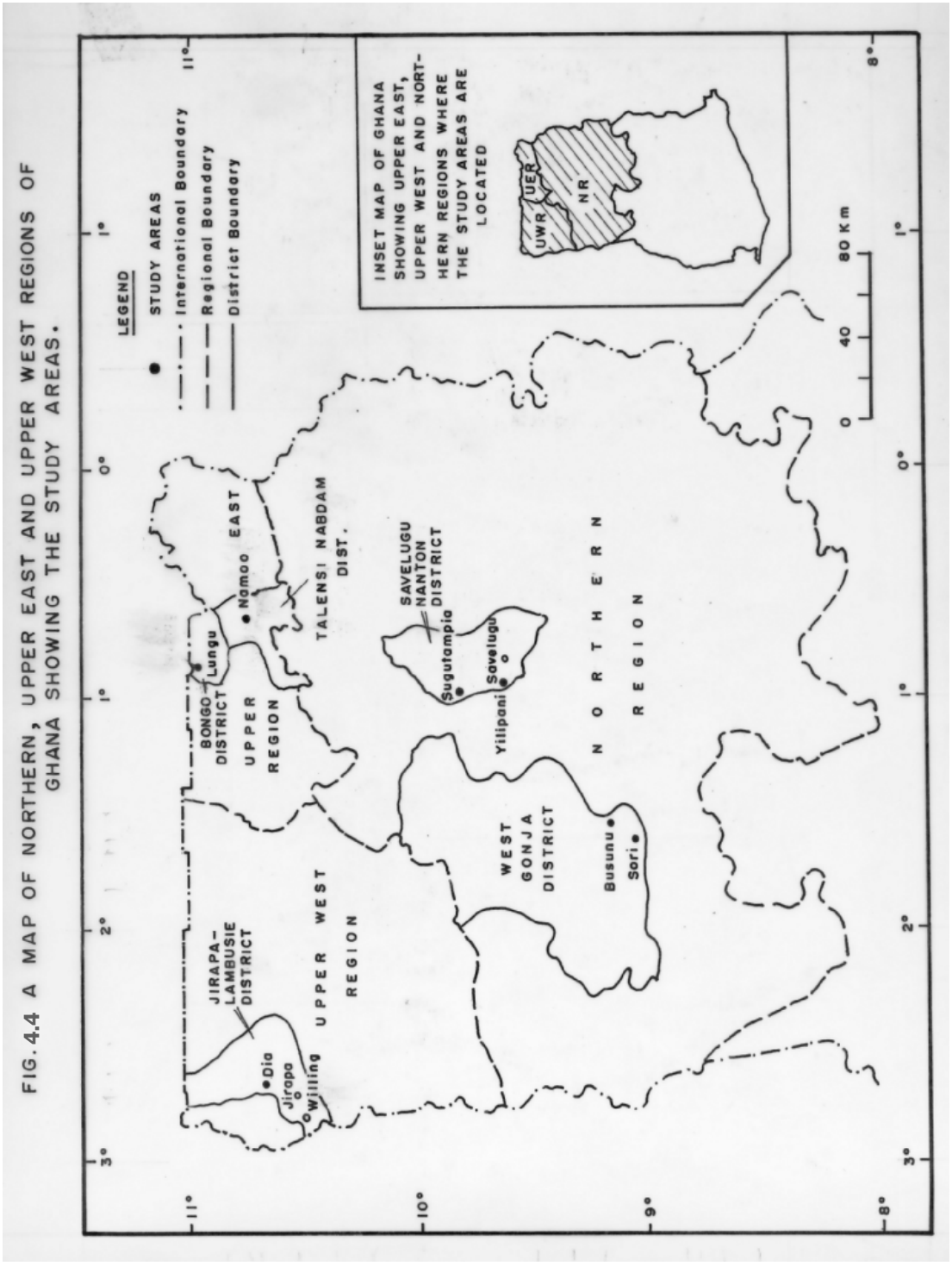
4.3.1. Practical aspects of the fieldwork in the rural communities

Before going in details of the findings of the fieldwork, it is worth to say something about the methodology of the interviews,
about the role of the interviewer and on the different attitudes of the interviewees in the various communities and on some recurring differences in the behaviour of the men and the women.
First of all, given the semi-structured nature of the interviews, people showed a tendency to digress and not to provide an immediate answer to the questions raised, especially when these were deliberately vague. This entailed the need to repeat more than once the same question, in an attempt to narrow the focus of the answers around the specific content of the question. This dynamic, although time consuming, offered interesting insights, highlighting the things that the interviewees were most willing to discuss about.
People from the eight communities displayed a changing attitude towards the interviewer, and their involvement in the discussion was consequently different. In most communities (Lungo, Die, Sugutampia and Yilipani) people seemed pleased we were there to listen their voices and happy to talk with us about their livelihoods. The impression we had was that their answers were unbiased, that they were truth telling. In Namoo, people explicitly said that they were tired,

because often people came to ask questions, but this did not lead to any improvement or change for the community. Some of the answers they provided were actually hasty. In Sori, people – and especially the male group- clearly wanted to exploit the situation. They took their time before providing an answer, as they tried to find an agreement on how to answer. They tried to give the answer that they perceived as the most convenient for themselves, not the most sincere. Finally, in Busunu and Willing, the impression we had was that people were almost not interested in our presence, but not in a negative sense: some of them wanted to express their opinion, some others were there only because someone had asked them to be there. However, this attitude appeared not to be detrimental for the answers.
The conduct of the interviews with separate groups of men and women produced complementary – and only seldom contradictory – information, as women and men's perspectives often differed and the opportunity to compare them contributed to reach a better understanding of the phenomena of interests in the community. Both groups – although this tendency was more common among women - tended to provide gender-specific answers, referred to their gender group rather than to the whole community, so that it was often necessary to emphasize that we wanted them to broaden the focus of their answers. In general, women tended to have a more positive perception of the changes occurred over the past few decades, probably because they had acquired a more influential role in the community as a side-effect of these changes.

4.3.2. Basic features of the selected communities

The sampled communities offer a fairly broad overview of the livelihood strategies adopted by the rural population in the Northern areas of Ghana, as several features differ across sample communities, namely the remoteness, the road system, the prevailing farming and off-farm activities and the reliability of extension services.
Subsistence farming represents the unique agricultural activity in some of the selected communities, where the trading activities only seldom exceed the boundaries of the community itself; these are the most isolated communities, where the movement of people and the transportation of goods represent substantial hurdles to trade. The communities of Die, Namoo, Lungo Dabotin and Yilipani fall into this broad categorization. Other communities have instead more frequent and easier contacts outside their narrow boundaries, either because they host a periodical market – as Busunu and Sori – or because they are built along main roads, as Willing.
Significant differences among the rural communities are marked precisely by their connections with major centres, and by the road accessibility: in the West Gonja district, one of the two surveyed communities is along a major road, while the other – although it hosts a market – is connected to the district capital only by a 20 km long uneven, unsurfaced road, that renders transport extremely difficult and time-consuming during the rainy season. These poor connections render this community a rather isolated one, although to a lesser extent than the communities in the northern part of the district - that were actually excluded from the random draw as they cannot be accessed by a motor vehicle at any time of the year.
The sample communities provide a picture of almost all the main agricultural activities that are common in Northern Ghana, and to the problems they faced over the past decades (see section 3.7). One of the surveyed communities, Sugutampia, is close to the White Volta river, and the interviews that were carried out there offered the chance to pay a closer look to the problems connected to fishing activities and to irrigation; Sugutampia hosts one of the sites of the recent Mango Plantation project promoted by the IFTC, that is spreading in Northern Ghana (see section 3.6.1). Cotton plantations were diffused until a few years ago in the community that we visited in the Talensi Nabdam district, so that this gave us the opportunity to enquire about the reasons behind the collapse of this farming activity, and the almost complete crop abandonment. Cotton crops used to be one of the main economic activities also at Die, Yilipani, Busunu and Sori. Namoo is one of the communities where the evolution of household livelihood strategies has been significantly influenced by the recent discovery of gold mines in the district, a discovery that has opened up new occupational choices.



Source: Department of Geography, University of Accra

The households of Sori suffered instead from the decline in the profitability of tomato crops, that have been almost abandoned, while tomato is still grown nowadays in Sugutampia, even though with significant and increasing difficulties by the local farmers.
None of the sampled communities has ever based its subsistence on rice farming; this crop had been previously grown up in some of these communities, but the production was later abandoned because of scarcity of water, while those communities that still produce rice devote to that crop only a limited portion of their lands.[17]
The communities differ also according to their access to agricultural extension services, that are delivered by the district offices of the Ministry of Agriculture. These services can be regarded as satisfactory only in a few of the sampled communities. The characteristics and fertility of the land, and the availability of land for farming also represent key factors in analysing how different contextual conditions can result in the adoption of alternative livelihood strategies.
A preliminary remark is that our field work confirmed the hypothesis that the rural communities of Northern Ghana had to look for income sources that could represent an alternative to farming activities, or at least they had to renew and reshape the long-established, traditional agricultural practises. The abandonment of some crops and the adoption of new ones, the intensification and the extensification of land use and a different reliance on markets can be identified as the prevailing agricultural strategies to face the increasing hardship. The surge of non agricultural activities, as food processing, trading, handicrafts, tree cropping and temporary or seasonal migration are the other strategies adopted by the rural population.
The next paragraphs will present and discuss the main findings from the field work, in an attempt to emphasize the specific reasons that, in each community, have determined the need to modify the livelihood strategies, the ways in which the communities actually modified them - highlighting the factors that shaped the choice among the set of feasible alternatives - and the ensuing impacts of those changes on the environment, on gender relationships, and on the welfare of the community.

4.4. Agriculture and related activities[18]

4.4.1. Land productivity decline and coping strategies

The attempt to gain a solid understanding of the major changes observed in farming activities over the past twenty years – and of their underlying determinants – is the main purpose of the focus group discussions, that pointed out some common patterns alongside with community-specific events. A common feature across communities is the wide set of crops that are cultivated in all them: yam, maize (yellow corn), groundnuts, sorghum (guinea corn), cassava, cashew, bambara beans, cowpeas, soybeans and millet, while other common crops are rice, beans, tomatoes, and other vegetables (bito, berisi, ayoyo, okro, yoga).[19]
All communities stressed the increasing difficulties faced by farmers as a result of the decline in land fertility. Everywhere soil erosion was blamed as the main factor behind the declining land yields, as the plots of land are becoming increasingly sandy, and display worrisome signals of a progressive desertification. More erratic rainfalls, the demographic pressure on land and the high costs of fertilizers – that are no longer subsidized – are the other explanations proposed as determinants of low land productivity.[20] This situation forces farmers to look for alternative strategies to keep their consumption patterns unchanged.
In Lungu Dabutin, the community we visited in Bongo district, people said that farming has become more difficult for several reasons, basically because of the unreliable rainfall pattern and

[17] We visited a paddy field in the Bongo district that was close to the Lungu community, interviewing the farmers about their reactions to the changes occurred in the rice market over the past decades.
[18] The content of this and of the next paragraphs draws from the field study, so that any statement that is not supported by a bibliographic reference is based either on the focus group discussions or on the interviews realized in the sample communities.
[19] Sugutampia represents an exception, as the variety of crops is smaller because farming has only recently been introduced in the community (see Box 2).
[20] See Chapter 3 for more information on climate change in the north of the country, and about the removal of subsidies on fertilizers.

because of the overexploitation of the soil, that is less fertile than it used to be[21]. So, land does not produce enough food, and they cannot afford to buy fertilizers to improve land yields. As the prices of food continue to increase, this is detrimental for a community of net food buyers. Furthermore, farmers report an uncertain access to land, due to the high population pressure and to a poor definition of land property rights, an issue that was raised also in the nearby district of Talensi Nabdam[22], where population growth is leading to an increasing fragmentation of land holdings, and disputes over land are becoming more frequent. The average land holding per household is only 1.2 hectares, well below the national average of 4 hectares (MofA, 2006a). People from Namoo said that the decline in soil fertility, the increase in crop pests and diseases, the removal of subsidies on fertilizers, the lack of credit and an unreliable rainfall pattern, all led to a decline and a higher variability in land yields.

In the West Gonja district, people complained primarily about the high price of inputs. The MofA officers are aware that World Bank and the International Monetary Fund strongly advice against a reintroduction of subsidies; still, they believe that this would be necessary in order to increase the farmed acreages because, as - comparing the cost of the inputs with the selling price of crops – no wonder that most crops determine an income loss for farmers.

Similar complaints have been raised in Yilipani – in Savelugu Nanton district - where the need for fertilizers goes along with the farmers' inability to afford their cost. People from this village were complaining the consequences of land erosion, of the frequent droughts and of a higher population pressure on the land, something that worries farmers in Sugutampia as well.

Box 2. Sugutampia, a former fishing community

Sugutampia represents a stand-alone case among the communities that we visited, as fishing represented for a long time the main economic activity. The community was established in the 1950s along the shores of the White Volta River by a group of fishermen, but farming has acquired a greater role since the early 1990s as fishing activities suffered from a severe crisis. The depletion of the stock of fishes in the river has been attributed to two main causes: the first one is the use of large, illegal fishing nets by commercial fishing companies, so that small fishermen have moved their boats closer to the shores, resorting to finer nets to capture small-sized, young fishes, thus contributing to the depletion of the fishing resources. The second factor relates to the newly-built dams in Burkina Faso, that substantially decreased the river flow, that apparently induced fishes to abandon this area where they used to breed. Furthermore, a raise in the costs of fishing tools induced households to search for alternative source of revenues, introducing farming activities in Sugutampia.

One of the main consequence of the lower land fertility – that has been reported in all the communities - is the inadequacy of yields to cover farmers' consumption needs, that have to be partially met through market purchases. Such situation was reported in all the focus groups discussions, alongside with the complaints about the soaring of food price.

The need for cash has been emphasized in Die, in the Jirapa Lamboussie district, where people said that there is a big necessity of resources to purchase inputs and fertilizers, to rent tractors and to hire labor, as "there is not enough labor in the farm because children now go to school", a farmer said.

Intensification or extensification in land use is one of the other strategies people resort to in an attempt to increase earnings from agricultural activities. In Willing, the use of the land has been intensified both on the intensive and on the extensive margin. In Die farmers tried to intensify the use of the land because of its scarcity, while land abundance induced farmers to extend the

[21] The soils of Bongo districts have been known to be very productive, because they contained potash and phosphate; the problem is that the soils are farmed more or less continuously, so they lack organic matter and nitrogen. The population density of the district is very high and the pressure on the land is becoming excessive, even because people have moved from the widely oncho-infested areas of the district and concentrated on less than half the land area of the district (MofA-Bongo DADU, 2006).

[22] The soil of Talensi nabdam district is deficient in organic matter contents, nitrogen and potassium, so it easy susceptible to erosion and declining fertility. According to Mofa report, low yields are due to the farming system practiced – main farming system is rain fed mixed cropping, high level of intercropping-, to the land preparation methods used and to the location of the farm (in compound or in bush).

size of the farmed land in Sugutampia and in West Gonja district, where farmers have also shifted to new plots of land, letting the old ones to fallow.
In Yilipani farmers used to have a greater variety of crops, while the progressive decrease in land yields has induced farmers to increase the land where maize is grown, reducing the land devoted to other crops.[23] We can infer that, in times of stress, a possible strategy is to concentrate all the efforts in cultivating more productive crops at the expenses of variety.
In Willing, people explicitly reported that the drop in yields worsened their food availability compared to the one they enjoyed 20 years before, so that it became necessary to abandon traditional crops in search for higher yields from newly introduced varieties. In fact, the MofA advised the farmers to introduce crops that were less dependent on fertilizers, and with a greater resistance to droughts. Thus, over the past 20 years the farmers changed significantly the set of crops they rely on.
Soybeans, for example, have been introduced in all the communities in the 1980s.[24] This 'new' crop has several advantages: it does not require any fertilizer or compost, it is good for the soil and it has good nutritional characteristics[25]. At the same time, farmers stopped to cultivate some crops, especially rice and cotton. We were especially interested in these crops, because, as we saw in the previous chapter, their profitability has been largely influenced by the economic reforms of the last decades.

Box 3. Rice

The cultivation of rice spread in Northern Ghana since the 1970s. The profitability of this crop has collapsed since imported rice has been introduced in the domestic market free of any import tariff (see Chapter 3), with an ensuing reduction in local production. The producer price of rice in the Northern Regions has slightly recovered over the past few years.
In the communities that we visited in West Gonja, people told us that rice used to be both a staple and a cash crop in the recent past, but they stopped cultivating because of the high cost of inputs, because tractors are no longer available, and there are no animals for ploughing, and because of the irregularity of the rainfalls. Although the farmers lamented the poor returns to this crop, rice is still farmed and sold on the markets in Namoo. Farmers from Willing are also keeping some land for rice cultivation, but this has always served only for self-consumption purposes; only recently some farmers have begun to sell a small share of their harvest on the market.
The perception about the profitability of this crop is different in other communities: the people of Die and Yilipani suggested that rice is more profitable now than it used to be 15 or 20 years ago, even though they admit that yields are heavily sensitive to rainfalls. When the rainfalls are timely and abundant, rice outperforms other crops. Almost every household cultivates rice now, but mainly on small-scale basis for self-consumption, and only when they a good rainy season provides them with some extra bags of rice, they sell them on the market. In Sugutampia, where they have been cultivating rice since they introduced farming in the 1990s, people remarks that yields depend on the pattern of rainfall. In Lungo, people said that they have recently introduced rice among their cultivation because it is becoming more profitable.
We collected the same favorable opinion on profitability of rice near Lungo, where we visited a paddy, Yorogo, where rice cultivation is eased by the proximity to the Vea dam, that has been built about 40 years ago. They cultivate rice in the land close to the dam. We interviewed the rice farmers, who said that each household has a piece of land, and people come from outside the community to rent or buy the land for farming. The activity is now a little more profitable than it used to be, because the price of rice has been quite good recently. At the same time, problems have been on the raise, as the soil is not as fertile as in the past, so they have to buy a lot of expensive fertilizers to keep yields at a good level.

[23] People said that the fortune of maize in the community in the following months depended on the evolution of the poultry crisis that recently hit the country, causing a drop of the maize prices.
[24] When soybeans were introduced, the production immediately increased, but people did not know how to use the new crop to prepare food, so a later decline in production was recorded. Only when MofA taught them how they could have been cooked, the production increased again.
[25] Besides soybeans, in each of the sample community farmers started to cultivate some other particular crops: in Busunu and in Willing they started to cultivate cashew, while cowpeas have been introduced in Die and in Yilipani, where also the rice is a new crop; in Sori, farmers introduced cassava, cashew, cowpeas and new varieties of beans, maize and yam; in Lungo maize, rice and new brand of sorghum and cowpeas; In Namoo the new crops are bambara beans and new kind of vegetables, while in Sugutampia the most recent crops are cassava, beans and watermelon.

From the opinions we gathered in the focus groups, rice seems to be a staple crop rather than a cash crop. It is grown in almost all communities, but only a few of them still sell part of the harvest in the market. Conversely cotton is totally absent in the communities we visited, although used to have an important role in the livelihood of some of them (see boxes 3 and 4).

4.4.2. Crop production and marketing

Agricultural production is mostly aimed at meeting household subsistence needs; surplus sold in local markets – processed or not - is a new and growing phenomenon, limited to only a few products. Marketing surplus is feasible for those communities that are well connected to the markets or that host a periodical market. Transport of farm produce from remote areas to the main markets requires a notable effort, as transport infrastructures and services are inadequate[26]. This implies that the farm price depends on the geographical location of their own community. There are some traders, the so called 'middlemen', that reach the remote rural communities to purchase the crops, that they then resell at a substantial mark-up.
In West Gonja district, a large part of which is almost inaccessible during the rainy season, the lack of a proper access to the market represents a major concern for farmers. A good harvest does not suffice to obtain good earnings when the middlemen are the sole opportunity to reach the market, as the monopsony the farmers have to face considerably curtail their bargaining power. A similar concern has been raised by the officials of the MofA office in Pong Tamale, in the Savelugu district.
Only a handful of crops are marketable: groundnuts, soybeans and rice, while other crops are cultivated only for self-consumption, and only in the unexpected event of a very good harvest, the surplus production is sold. In some communities, as in Yilipani and Die, people reported that they started only recently to occasionally sell part of the harvest to the market. In Lungo, farming is practiced only for self-consumption, and people use to sell agricultural produce only if they need money to cope with unexpected expenses.

Box 4. Cotton

None of the sample communities grows the cotton, although some of them did so in the past. Cotton is a very peculiar crop, as farmers need the intermediation of cotton companies which represent the sole buyers of the raw material. In Busunu, they abandoned this crop as "the Cotton Company does not come anymore", a farmer said. In Sugutampia, people declared that they do not cultivate cotton because they do not have market for it, since the Cotton Company never came in the village.
Farmers in Sori used to grow the cotton and women made thread from it, but these activities were discontinued because of the low prices. People from Die said that cotton growing is not remunerative because of the high cost of inputs, and because of the low soil fertility, while in the past high procurement prices provided good incentives for the cultivation.
The assembly man of Namoo has been a cotton farmer himself between 1975 and 1985, and he told us the history of this cultivation in the community: cotton farming started in 1972, and in a few years cotton spread all over the district, as it was at that time the most profitable crop. The Cotton Company provided inputs to the farmers, the pattern of the rainfall was predictable, and yields were therefore satisfying. Things started to worsen in the 1990s, as the rainfall pattern became more erratic, and the Cotton Company started to charge prices for the provision of seeds and fertilizers. Nowadays, cotton has disappeared from the community.
In Yilipani, they stopped to cultivate cotton two years ago, as there was an increasing need of land to grow food crops. When they started to cultivate cotton, a long time ago, it turned out not to be so profitable: the Cotton Company gave money only to people who reached a minimal amount of output, so that small farmers were excluded. The company considered inputs and fertilizers as credit extended to farmers, so that the procurement price discounted for this, but farmers had a poor understanding of this interlinked transaction and often complained about the low price they got for their cotton. Farmers explain the low productivity and the poor quality of their cotton with the inadequacy of the local soil for this produce. The Cotton Company argues that it was not infrequent that inputs given by the company were used for other crops, so and this reduced cotton yields and quality (see section 3.6.1).
In the district of Jirapa cotton is still grown, but the price is low and the cost of production is high, so that most farmers are no more interested in this cash crop. Sometimes the companies delay the payment, which are local monopsonists because of a recently introduced zoning system.

[26] People from the Sori said that even the transportation of the harvest from the farm to their houses is costly for them.

Groundnuts are particularly attractive in Jirapa district, where the soil is mainly sandy with underlying iron pans – that is to say, very fertile - and it allows for large scale cultivation of groundnuts and cowpeas. Here, people argued that only groundnuts are regularly produced for the market, while all the other crops are only for household consumption – except in Die, where they sometimes sell rice. Sori is the sole community where cashew and yam are the major market-oriented crops.

4.4.3. Rural extension

Every district has a local office of the Ministry of Agriculture, named DaDu, acronym of *District Agricultural Development Unit*, that is in charge of all services to farmers. The services they generally provide include promotion of new crops and varieties, advices on soil management, provision of credit, facilitation of farmer groups, provision of water for irrigation and veterinary care (MofA, 2006b). Every local office has a large autonomy in the definition of its working practices. In the past they offered additional services, as the distribution of inputs and fertilizers (see box 5).
Now the main occupation of extension officers is to give technical assistance to farmers. Table 4.2 shows how the average number of farmers served by one extension officer varies across sample districts. On average, there is one extension officer for approximately 1,500 farmers, while the recommended ratio should not exceed 500. The situation is particularly difficult in West Gonja district.

Table 4.2. Extension officers and farmers across districts

District	Farmers to extension officer ratio
West Gonja	3,308
Talensi Nabdam	1,950
Jirapa Lamboussie	1,300
Bongo	1,700
Savelugu Nanton	1,300

Sources: MofA (2006a), MofA (2006d), MofA-Bongo DaDu (2006), MofA-DaDu (2007), DaDu-MofA (2007)

The limited number of extension officers does not allow them to make frequent visits to the communities, and thus to properly 'supervise' farmers' activities. The inadequacy of public funding and of personnel is a binding constraint. The budgetary cuts introduced in the 1980s determined a slash of the personnel employed in the district offices of the MofA. The staff has been reduced by one third when the subsidies have been removed, and only professional staff was kept.
To provide a telling example, the 8,300 kmq wide West Gonja district - largely unaccessible by road - has been divided into 10 operational areas, each one served by a single extension officer, while only three veterinary are assigned to the whole district. In the Savelugu district, the same lack of funds and human resources led to the choice to focus only on a limited number of farmers that are geographically concentrated, rather than providing an inadequate cover of the whole district.
The limited budgetary funds of the DaDu are often complemented by funds provided by donors, and the offices frequently cooperate with the NGOs who are operating in the same geographical areas. A related problem arises because of the temporary character of this kind of collaborations, that are often discontinued because of the interruption of the financial support, notwithstanding their successful records.

Box 5. The MofA and fertilizers

From an interview with an official of the information service of MofA department in Tamale, we learnt that the free provision of fertilizers to farmers begun at the beginning of 1970s in Northern Ghana, on the initiative of a development project financed by the German Government. Initially, fertilizers were provided completely free of charge, because it was necessary to show to farmers their efficacy in raising yields. Farmers had no familiarity with fertilizers, and they used to practice shifting cultivation because population was low and it was possible to move from a place to another in search of a new land, and to leave the land fallow. After this initial period, fertilizers started to be provided at subsidized prices, thus providing a support to farmers' income. The program went on until the 1980s, although prices had already begun to rise slowly, until the subsidies were fully removed in 1991.
The distribution network of fertilizers was very good: there were fertilizer stores, well managed by the government, and extension officers sold them – together with seeds and tools – across the rural areas. After the removal of subsidies, the system was privatized in 1993, following a prescription of the World Bank, and the MofA decided to provide only extension services through its local offices. The new private organizations started to sell fertilizers, but they encountered a lot of difficulties in reaching out all the communities. Now farmers need not only to shoulder the full cost of fertilizers, but they also incur in transportation costs, as fertilizers and seeds are found only in the main market centers.

The effective presence of the extension officers in the community may not be enough to ensure a good management of the farming activities. The extension officers that we interviewed emphasized that a usual problem is represented by farmers' resistance to the implementation of recommended changes. The technical demonstrations conducted on the farms by the MofA officials are often adopted for only a limited time period by the farmers, that tend to revert to the traditional practises. The low adaptation rate of farmers induced the MofA to resort to new approaches, as the attempt to work with groups of farmers and the introduction of participatory techniques. The basic idea was to involve farmers to a greater extent into the programmes, and improve their ownership of the projects. The *Agricultural Extension Handbook* suggests that:

> "to increase agricultural production and productivity especially at the small holder level, a structure is needed at the grassroots that will put the tools for agricultural production and marketing in the hands of the farmers themselves with the extension agent playing a facilitator role and providing the needed technical knowledge and skills." (MofA, 2006b, p.218)

Notwithstanding the problems of the DaDu offices and the frequent deficiencies of their services, our survey evidenced that the results of their programmes have been positive in those communities that had been better served, and where the farmers were more respondent to the recommended changes in farming techniques. In these communities, people's perceptions of these programmes were clearly more positive, as the introduction of the new crops and their success depend heavily on the work done by the MofA extension officers.
It is interesting to remark that there is a certain similarity of views on this subject among the communities within in the same district, indicating that we can probably draw some implications on the quality of the service in the entire district. A common argument was that the service worsened, because they stropped to provide fertilizers free of charge[27].
In West Gonja district, farmers praised the services of the MofA, although they lamented their progressively more limited extension. In particular, in Busunu, people described in detail all the functions of the extension officers who periodically visits the farmers[28]. Farmers complained

[27] Despite the complains of farmers about the interruption of fertilizers provision, in the West Gonja district a DaDu official told us that farmers used to apply fertilizers in a careless and inadequate manner when these were provided free of charge, precisely because the lack of any direct cost reduced farmers' effort on the field; a parallel can be drawn here with the system of water delivery: today communities have to pay 10 percent of the effective cost of the delivery, and the system appears to be working more properly than it used to when water was provided for free.

[28] If there is an outbreak the extension officer reports the news to the office. He shows how to mix cropping, he makes training on how to plant seeds (previously they used to plant randomly) and gives suggestions on where to buy good seeds for planting. Extension officers organize groups and support them with credit; in the past only the men were giving loans, while now they are provided only to the women because MofA realized that they pay back. Male farmers said that MofA asked them to open bank accounts for loans four years ago, but they are still waiting for the loans. In Sori, people told that extension officers showed them how to plant maize and how to apply fertilizers and they introduced soybeans and cowpeas. Among the new activities provided by extension

because in the past the so called 'agric-officers' gave oil, seeds for planting and chemical for destroying grasses or weeds. In both communities, people said that the staff is insufficient, so that they are not able to keep frequent contacts with all the farmers. They mainly come upon request, while previously they used to come more often. Moreover, the result of adhering to the advises of the agricultural officers are every day less predictable, because of the erratic pattern of the rainfall.[29]
The worsening of extension services has been underlined also in Jirapa district. However, in Die people recognized that the technical recommendations of the extension officers have been useful to improve agricultural techniques (e.g. they learned how to plant in ridges).
Conversely, the services of extension officers is not appreciated in the communities of Lungo and Namoo, in the Upper East Region, where people told us that extension officers come only to give some advice to farmers - mainly on new crops - but they believe these services are far from being satisfactory.
Neither of the communities we visited in Savelugu Nanton district have a good perception on the extension officers. In Sugutampia, there is just a veterinary but no extension service, while in Yilipani, the service begun only recently and in the past farmers used to go in other communities to meet them. Now they come only occasionally, because they lack cars.

4.4.4. Animal husbandry

Livestock rearing is seldom perceived as a profitable activity. Those who own a large number of heads of cattle are portrayed as being 'rich', although this perception is not due to the profitable nature of rearing activity, but rather to its role as a store of wealth. Cattle is the main store of wealth that can be readily sold to allow the owners to cope with adverse shocks, or with the need to cover unexpected expenses. The start-up capital that is required for livestock rearing is consistent.
Also this sector witnessed notable changes over the past 20 years. New species were introduced[30], some of the smaller animals started to be used for commercial reasons - especially pigs and poultry, but almost everyone lamented a greater spread of diseases and a reduction in the life period of the animals. The feed and water availability for the animals are regarded as inadequate[31], veterinary services worsened in most districts and they became costly. In the better connected communities, like Busunu, animals are often killed by vehicles or stolen by thieves.
Also veterinary service is provided by DaDu offices, who admit that the service is now too expensive, while in the past the vaccination and the treatment of animals were provided for free.
Savalugu Nanton is the only district where people say that veterinary service is better now than before, probably because it is more recent. In Sugutampia, when they started rearing livestock in 1993, there was no veterinary service and often livestock died because of minor diseases. Today, DaDu offices offer this service, animals are healthier than before, so that the households can obtain a larger and less risky income from livestock, and a similar improvement in veterinary services has been reported also in Yilipani and Sori.
Although farmers have to pay for the medical treatments to the animals, these services are not perceived as being unduly expensive in Sori. Still, in Busunu people complain for the animal diseases that can not be treated by the few veterinaries who work in the West Gonja district. They are appreciated in the communities, as they make injections on animals, and educate

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officers there is also the spraying of crops against pests and weeds. MofA offices in Damongo –the district capital of West Gonja- said us that recently they started the *Cashew Development Project*, aimed at the introduction of this new crop coming from Benin.

[29] As we already mentioned, we could not visit the more remote communities in West Gonja; MofA officers in Damongo told us that the major problem even for them is to reach these places, so that it is fair to assume that their services are not so efficient there as they are in the rest of the district.

[30] In Busunu they have recently introduced pigs. In Lungo improved varieties are now reared to meet the demands of the market (pigs, rabbits, and poultry birds). New animals are now reared also in Namoo: pigs, turkeys, and ducks. In Sori, donkeys have been recently introduced.

[31] The problem of feeding animals and providing drinking water is felt as particularly severe is Willing. Often livestock go towards the river to search for water and they get lost.

farmers on how to keep them (in the past livestock reared free, owners did not give them shelter, water and food, as they do now).
In some communities, as Die, Lungo, Namoo and Sugutampia, the main problem regarding livestock is represented by the cost of veterinary services. Since it is too expensive, animal diseases are much more common than in the past, and animals often die because people cannot afford the necessary treatments and the drugs. People in Lungo said that only farmers who have money can afford them, so they are compelled to sell goats and sheep at the beginning of the rainy season to avoid the risk of diseases. Similarly, in Namoo, every year - in November or December - guinea fowls die. The veterinary says that they have started to die at a certain age because of the weather changes and because the shelter that is provided to these animals is inadequate. There is only one veterinary for a large area and its service is costly, as the drugs are, so livestock owners are not able to avoid the spreading of diseases.

4.4.5. Main issues and possible solutions

People were able to discuss and identify the main constraints for farming activity in the focus group discussions, and to propose possible solutions to overcome these obstacles. Since the lack of water and an erratic pattern of rainfall is one of the major problem in whole Northern Ghana, irrigation could be a natural response. But the construction of dams and dugouts for agricultural purposes have always been very limited over the past decades. Some of the communities we visited, as Namoo and Lungo, are located not far from rivers or lakes, but that water has never been used for irrigation. Also in Sugutampia, that is located just near a river, farmers have only seldom used its water for farming, cultivating small plots of land near the river. A MofA-sponsored project for the introduction of irrigation in agriculture started recently, but it has not yet been completed. In Savelugu Nanton district, some other projects on small scale irrigation have been adopted, but only three out of seven have been already completed.
Since most farmers use indigenous methods for farming and rely on rain-fed agriculture, also the a greater reliance on more advanced techniques is regarded as a proper solution for the problem of low yields. The only community where people do not complain about the lower productivity is Busunu, where the adoption of new technologies prevented land yields from falling, and this provides further support to the role of the extension officers that helped farmers in moving towards these newer techniques.

Box 6. Tomatoes

Tomatoes are grown in almost all the communities we visited, but mainly for self-consumption needs, and when there water is not scarce. All farmers lament that the profitability of this crop worsened over time. Tomatoes rotten in a short time, so that it would require a good storage system, and the lack of such a system forces the farmers to sell the produce as soon as possible and all at once, thus bringing price down.
Tomatoes are perceived as a profitable crop in Willing and in Die, where planting tomatoes in gardens has always been a traditional activity, that recently turned into a larger, market-oriented one.
Farmers from Sori grow only a small quantity of tomatoes as they lack the chemicals to prevent spoilage, there is not enough water, and there are no more seeds, so that only two people in the community can still produce them in large quantities. For the farmers of Sugutampia, this was one of the most profitable crops until a few years ago, but now there is no market for tomatoes because the demand is too low, and transportation costs hinder commercialization, and have induced farmers to grow this crop only to meet their own consumption needs.
In Yilipani, tomatoes are sometimes sold in the market, but the profitability depends on the rainfall and on the competition from other farmers. Also in Upper East there are tomatoes, so when the rainfall is good in both places, the supply is high and the price collapses. "The best for the community is when the rain is good in their land and bad elsewhere", a farmer said. Competition is in fact an increasing problem for tomato farmers, as a consequence of the import of canned tomato sauce from European countries, that captures a good share of the domestic market.

There is only one rain season in Northern Ghana, and, as a consequence, only one harvest. In such a situation, storage systems are crucial, because food has to be preserved from pests and rodent for a long period of time, and also because some of the produces are perishable - like

vegetables, tomatoes, yam or cassava. The failure to introduce adequate storage facilities determines high post harvest losses.
A useful service that the DaDu offices used to provide and that was then suspended or notably reduced was the mechanical ploughing of the fields. The use of tractors is helpful because it permits to put more land into cultivation[32]. In the past MofA had some tractors for farmers, while now there are only a few privately-owned tractors. Farmers are no longer able to employ tractors[33], as the costs for ploughing one acre is not affordable for most of them, all the more so after the recent increase in fuel prices.
Lack of finance is another problem for all the farmers of the region, who sometimes organize themselves in groups in order to search for credit. One of the services the MofA should provide is granting loans, but, even in the communities where the service is working, people said it is very difficult for them to obtain a credit.

4.5. Non agricultural activities

Our field work evidences that non agricultural activities are on the raise almost everywhere, although with significant differences across districts and communities. The most common non farm activities practiced in Northern Ghana are petty trading (in particular selling of agricultural produce), food processing, weaving, carving, surface mining and tree cropping.
People argue that the increase in non farm activities is tightly connected with the difficulties experienced in the agricultural sector. Infertility of the soil, the insufficiency of land because of increasing population pressure, the erratic rainfall pattern, all rank high among the answers that people provided about the underlying reasons for the rise of non agricultural activities. The inability to cover basic consumption needs and ensure food security with farming activities alone is the major push factor behind the observed diversification of economic activities.
Still, people mentioned also some relevant pull factors: most notably the proximity of a market offers a great stimulus to the development of non farm activities. In Yilipani, the recent improvement in road leading to the community determined a surge in trading activities. In Sori, women mentioned the better technologies for food processing among the pull factors.
Everywhere people said that the non farm activities do not substitute, but are rather complementary to farming. The only exceptions were found in the communities of the Jirapa district, where people reported that the crisis of the farming activities did not induce them to search for complementary activities. In the Willing community men reported to devote their time almost exclusively to farming, as no other activity is remunerative; women in the Die community reported that the hardships induced by the lower land fertility forced them to devote more time to agriculture than they used to do in the past. "When farming is good, you can do other activities, when farming is not good you can not", a woman said[34].
The peculiarity of the Jirapa district is interesting, and – as we shall see – plays an important role to understand the different reactions to the difficulties faced by the households in their agricultural activities. The explanation of the limited relevance of non agricultural activities in this district can be probably traced back to the scant opportunities to develop them.
In Willing, the unique traditional non agricultural activity practised by the men during the drought season is carving, while in Die men are devoted to masonry, although not as a salaried job, and they also recently began to plant carcia trees. Other activities are those that are typically done by

[32] Mechanical ploughing had also some negative consequences, as land degradation progressed faster with the use of tractors as it facilitates soil erosion and compaction.
[33] In Savelugu Nanton, for example, DaDu officers said us that mechanized farming has been introduced in the last decades, but today managing the same area is a problem because tractors are expensive and farmers have to rent them. Local DaDu office had tractors, but since the machines broke down they were unable to replace them (DADU/MofA,2007); In Bongo district, there are only seven tractors in all the district used by groups of farmers.
[34] The data from the 2000 National Census show that non agricultural employment in the Jirapa district stands below 20 percent, lower than in all the other districts of our sample (GSS,2005b).

the women, that do not appear to be on the rise – like in the other districts - but rather to have experienced a decline[35].
Table 4.3 reports, for each district, the sectorial distribution of the economically active population. From these figures, we can form a first idea on the development of non agricultural activities in each of the district we are analyzing. The differences among districts are consistent. The ones located in the Upper East Region and Savelugu Nanton show an high percentage of people working in manufacturing and in trade as compared to the other districts. It is interesting to note that the two districts where the percentage of agriculture and related activities is lower are the ones with the higher population density (Bongo and Bolgatanga with respectively 188 and 155 inhabitants per square-km).

Table 4.3. Sectorial occupation of the economically active population (15 years and above). Percentages.

	West Gonja	Talensi (Bolga)	Jirapa	Bongo	Savelugu
Agriculture, hunting, forestry and related jobs	78.3	51.6	81	58.5	62.2
Manufacturing	4.3	18	5.8	26.4	14.8
Wholesale and retail trade	3.5	10.8	2.9	6.6	10.3
Others	13.9	19.6	10.3	8.5	12.7

Source: GSS (2005a), GSS (2005b), GSS (2005c)

Traditional small scale methods dominate in manufacturing. The only factories using modern technologies operating in those districts are the *Northern Star Tomato Factory* and the *Cotton Ginnery* in Talensi Nabdam district – that still operate although their activities have been substantially reduced compared to some years ago (Talensi Nabdam D.A., 2006) – and the *Shebu Industry* in Savelugu Nanton (Savelugu Nanton D.A., 2006).

We now describe the development of non farm activities in the communities we visited, in order to give a picture of the possible pathways out from farming people can undertake, and to discuss the hindering factors that emerged from the focus group discussions.
Food processing and petty trading are the non agricultural activities that are more diffuse among women. All communities registered an increase in the volume of traditional non farm activities practiced by the woman over the last decades. "Today you can raise more money with trading than with agricultural activities", women reported during the focus group discussion in Sori. In Yilipani, the trading of agricultural goods, the processing and the sale of shea butter and paddy rice[36] cannot be considered new activities, but what is actually new – as it has been emphasized by both men and women during the respective focus group discussions in several communities - is their greater role as a source of cash, as households resort to the market to satisfy their consumption needs more than they used to. Usual activities as retail trading and food processing recorded a marked increase also in Namoo, as women shifted a greater share of their working time to perform these activities. Shea picking is a common activity here: there are a lot of shea trees, and the fruits are used for self-consumption while the nuts are sold.
Food processing is often conducted on a small scale, as larger scale processing requires unaffordable investments. When the raw material can be found in the community, the operational costs that women face are relatively low, as they only need to purchase the equipment that is required for the processing activity. Having the chance to employ only a few tools, food processing is a time-consuming and often tiring activity for the women. Semi-mechanized processing is extremely rare, as in the majority of the communities adequate processing equipment are lacking because of its cost and of a limited know-how about non traditional processing techniques. Water availability can represent a critical factor for food

[35] The women in Willing are devoted to the traditional non agricultural activities, that are pito brewing, dawadawa processing, sheabutter processing, pot making and weaving. They have recently introduced the habit of forming groups to carry out together some of these activities. Pito is a traditional alcoholic beverage, made from fermented millet or sorghum, while dawadawa is a fermented food made from the seeds of dawadawa trees.
[36] When the rice harvest is low, the women of Yilipani purchase raw paddy rice at the market, they process the rice that is then sold at the market in Savelugu.

processing, as some activities – as shea butter processing[37] and rice parboiling – are water-intensive.
In some of the communities, as Namoo, Yilipani, and Busunu, woman formed groups to further develop these activities. The formation of groups – that is often supported by NGOs – has become increasingly common, and it is often instrumental to obtaining credit to being or to develop some economic activities. On the other hand, women in Sori work individually, and this precludes their access to credit. Several NGOs have attempted to include them in credit projects and in the development of minor non farm activities, as shea butter processing, but the default rate was too high and the various projects fail badly. The difficulties encountered by team working in this area is probably related to the recent settlement of new groups that increased the ethnic fragmentation of the population[38].
The lack of – or at best scant – access to credit represents the main single obstacle to the development of non agricultural activities in Northern Ghana. The capital – and hence the credit - that is required to start up a trading activity is clearly related to the dimension of the trade itself. Large traders make a profit out of the differential between the low price paid for the agricultural goods during the harvest season, and the high sell price they obtain during the drought season. These kind of trade rests on the availability of adequate storage systems, and it thus needs large start up funds and it entails substantial risks, because of the fluctuations of the supply and demand for the traded good and because of the product spoilage. It is thus natural that large traders are regarded as the most affluent community members in Sori, whose unique concern is to attract new clients and "to keep the money", a man said.
Conversely, minor trading activities can be set up with a limited amount of funds, although this can nevertheless represent a significant obstacle for most people, as the difficulty to collect the initial funds has been often mentioned in the focus group discussions as the greatest problem related to trade. This compounds the risks associated to the uncertainties of earnings, that are sensitive to demand fluctuations.
Timber and charcoal trade is a peculiar form of trade, as transport represents in this case a significant problem as these are sold outside the community. Notwithstanding these difficulties, the production and sale of timber and charcoal has increased significantly everywhere, causing non negligible environmental damages (see section 4.7).
The non agricultural activities performed by men substantially differ with respect to the initial and the operational costs, as they run all the way from wooden carving – that basically requires no up-front cost – to masonry, that cannot be performed without adequate tools, and to blacksmithing, that besides the costly equipment imposes high running cost to purchase the metals, that are often of dubious quality. The local availability of the raw material is crucial also for all the hand-made activities as weaving and fibre, as this reduces the running costs and it allows to get rid of the transportation costs that can otherwise undermine the profitability of these activities.
High transportation costs appear to hinder the profitability of non agricultural trading activities in the more remote communities. In Lungu, that is connected to Bongo, the district capital, through an uneven road that is often not accessible for a motor vehicle, there are difficulties to sell the handicrafts produced in the village. Notwithstanding the poor connection to the market, some handmade activities as basket and hats weaving developed and retail trading grew as complementary activity to agricultural work; moreover a group of weavers and a group of blacksmiths were established in the community.

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[37] The fruit of the shea tree ripens during the annual hungry season when food supplies are at their lowest ebb and agricultural labor requirements are at their peak. It is rich in vitamins and minerals and not lacking in protein. Inside the fruit is a seed rich in the mixture of edible oils and fats known as shea butter. The process of extracting the butter is quite long and exacting. After collecting the nuts, women have to remove the pulp from the seeds by scraping, boiling or burying the fruit. Then the seeds are dried in the sun, and pounded between stones to remove the husk or shell. The kernels are then dried and reduced into kernel meal by pounding. This process takes hours. Finally, the kernel meal is roasted, mixed with water and boiled over a wood fire. A mass of shea butter will come together in the pot. The oil has to be removed as it rises. When it is cool, it have to be rinsed with water and knead or churn.
[38] A further obstacle to the development of non agricultural activities in Sori is represented by the limited water availability: streams represent the unique source of water, and the time that women need to devote to fetch it clearly subtract time to their productive activities.

Tree cropping is a recently introduced activity, that is often fostered by NGOs, and that appears to be a promising one, as a small plot of land often suffices to begin with. This is mentioned among the non agricultural activities by the villagers of Sori and Sugutampia[39]. In the latter community, a *Mango Project* has been actually implemented by a private company, the IFTC. The company has to provide the farmers with the technical advice, seeds and tools to start growing organic mangoes on some fields that belong to the community[40]. The agreement with the farmers is that they have to sell the mangos to the IFTC – that exports them to Greece - until they have paid back for the support that has been provided by the company; when this period is over, the farmers are free to sell their mangoes to other buyers. Mango plantation is offering a lot of employment to the youth, 541 acres of the district are currently under mango production. The problem is that this activity is impoverishing the women, because shea nut trees are being cut to transplant mango seedlings.
Mining has been on the rise in the last decade in Namoo, mainly because of the recent discovery of minor gold fields in the Eastern corridor of the Talensi Nabdam district. Quarrying is of two kinds: the industrial one relies on granite outcrops to produce granite and marbles and other aggregates; the craft made stone quarrying is practiced to carve stones for construction. Several people have thus been attracted by these new forms of employment, that are sources of easy – albeit small – earnings. Mining activities is extremely risky for the miners, and the earnings are volatile, as they are related to the outcomes of the day - with no fixed payment – and conflicts among miners are frequent because of the ensuing competition.
Busunu is the sole village where we had the impression that the development of non agricultural activities has been driven more by pull rather than push factors. In fact, while the introduction of more advanced techniques has preserved the profitability of agricultural activities, the increased relevance of the local market has raised the incentives to undertake activities as pito brewing, charcoal burning, soap making, and processing of groundnuts or shea butter. This also led to the formation of some women group that – in this case – were also able to receive bank credit; in this respect, the limited distance that separates Busunu from Tamale proved to be a relevant factor in accessing the domestic banking system.

4.6. Migration

Migration is a common strategy in almost all the districts we visited, but there are important differences across districts concerning the reasons why people migrate, the role of remittances in the household income, and the perception that people have of this phenomenon. Just a first glance at the documents of the District Assemblies immediately reveals that there are some differences among them: migration is considered a relevant issue in the two districts in the Upper East Regions and in Jirapa district, while it is almost ignored in the other districts.
Census data show that migration is a common strategy at different ages and for both genders.
The Jirapa's population statistics show that women represent 60 percent of the people aged between 20 and 44 years, and the sex ratio remains low up to the age bracket 40-44, when it starts to recover, signaling a predominant pattern of male migration. This pattern that is common in the whole Upper West region, but Jirapa is the district where the gender imbalance is the greatest (GSS, 2005c). In fact, emigration from the Jirapa district is high, as a lot of people migrate to Southern Ghana and to Wa. The Konzokala-Willing belt is an area of particularly intense emigration, pushed by worrisome environmental degradation due to illegal surface mining (MofA, 2006d).
The sex ratio drops significantly - from 107.8 to 87.2 percent - from the 15-19 age bracket to the 20-24 one also in the former Bolgatanga district, but this phenomenon is not so accentuated as in other districts in Upper East region (GSS, 2005c)[41].

[39] Still, the case of Sugutampia is peculiar, as the farming activity has been only recently introduced in the community, as a response to the crisis of the fishing sector. This has also led the households to increase their reliance on women traditional food processing activities (shea, paddy rice, groundnut oil), and to introduce new activities as carpentry and masonry, that are performed by the men.
[40] A similar project has been undertaken in many other localities of the region.
[41] We do not have data only for Talensi Nabdam, but according to the Planning Officer of the District Assembly, despite migration is increasing, it is not still a so widespread phenomenon.

Both literate and illiterate individuals migrate: the former group is more likely to go abroad, while the latter moves predominantly to the Southern regions of the country. West Gonja represents a destination from other rural areas, because of the abundant availability of land, as this pattern is confirmed also by the sex ratio of the district, that stands at 103 percent (GSS, 2005a).

The focus group discussions provide a picture that is broadly consistent with administrative and census data. There are two main distinct kinds of migration. The most common pattern of migration is represented by seasonal or temporary migration of young men to other rural areas, or to Southern Ghana: during the dry season - or in a drought period - people temporally move towards more fertile areas in search of land for farming or for another job. This kind of migration - that was described by the people in the communities of the Upper East Region, Lungo and Namoo, and in the Upper West Region, Willing and Die – is on the rise. It is related to poverty and to low earnings from farming. In Namoo[42], people traced back the increase in migration to the raise in the incidence of poverty in the community and thus indirectly to the lower soil fertility. The link between poverty, lower soil fertility and migration was also pointed by the women in Willing. In Die, the assembly man reported that migration increased because of financial problems, scarcity of food, disputes around the land and lack of local employment opportunities, and poverty is once again identified as the single word that best summarizes the factors underlying the choice to migrate.

If the young men - and to a lesser extent women - are the first who migrate, also elderly people and married women sometimes are compelled to temporally leave their communities. Migration is generally regarded as a strategy of last resort: "we would rather work in the mines than leave our village", a farmer from Namoo said.

A similar kind of migration was described in Yilipani, although with some interesting differences. Here, households did not use to resort to migration as a coping strategy: a few people moved to Accra, but they only found poorly paid and degrading jobs, and inadequate accommodations. Recently, the bad harvests pushed even more men – both the young and the elderly - to move in search of more fertile land. Their scope is to farm a plot of land for about six months, obtaining a good harvest, and then coming back to the village with the produce. They do not work as salaried workers, rather they ask the chief the permit to cultivate the land in exchange for a percentage of the harvest. This represents generally a good strategy, as people manage to bring home more food than what they would have produced in their own village. This food is very important to feed their household and any eventual surplus is sold on the market, although they need to overcome the problems of carrying the produce in the village without incurring in substantial losses.

Remittances sent by migrants represent a complementary source of household income in all the visited communities, that becomes crucial to support recipient households during the slack season. Remittances are mostly used to purchase food and clothes, to cover educational expenditures or unexpected events as burials, and to improve the household dwelling. And they are sometimes also invested in agricultural activities. Besides cash, migrants bring back to their households in-kind remittances as clothes.

Some people from Willing reported that remittances allowed them to set up a new economic activity, as remittances represents a sizeable portion – ranging between 15 and 50 percent – of total household income in the community. People in Die said that successful migrants bring back food and money[43], that are sometimes invested for the next agricultural season or to set up a new activity, although most of the times they are devoted to purchase consumption items. In all the other communities but Willing, the contribution of remittances to household income is generally lower.

People are also well aware of the negative side-effects of migration, as it favours the spread of diseases (particularly HIV, as many migrant women are employed as sexual workers), it induces some young people to drop out from school, and many return migrants report sad stories of

[42] Some young people move from the community to Kumasi, and stay there when they find a proper employment, otherwise they get back to the village.

[43] Although people from Die regard poverty as the root cause of migration, they argue that it can also contribute to improve the social status of a household, as successful migrants – those who are able to send large transfers back home - are admired and praised by the community.

social exclusion and exploitation. "It is shameful at times to think about the sort of jobs that migrants do", the men reported during the focus discussion group in Lungo. The malnutrition of children, who suffer from the absence of their mothers from long periods, has also been mentioned.

The other kind of migration is typical of young women and we found it in Busunu and in Sugutampia[44]; in both communities immigration is common as land is still abundant there[45].

Young girls migrate to the south of Ghana, and they remain away from the village for some months, trying to earn a certain amount of money before getting married. Some of them manage to send home some cash and some in-kind remittances, but more often these temporary migration experiences turn out to be a failure.

'Successful' migration is considered as a source of social prestige for migrant household also in Busunu, as the relatives are proud when the daughter comes back with a considerable amount of money, or carrying nice clothes and having preserved her health condition, as the risk that migrants have to contract serous illnesses represents a major concern for the women of the village. Remittances do not represent a significant source of income in this community; the perceived benefits are limited to those families who have a daughter who is able to come back home with enough resources for her dowry.

The type of migration described in Sori differs from those observed in the other communities, and this can be probably explained with the historical origin of the village, that was born from the continuous immigration of groups coming from other areas of the country. Seasonal migration is not common here: the major push factor to migrate is the need of money, and if someone takes this decision, the whole family migrates and never comes back, and the permanent character of migration is regarded as detrimental. A new kind of migration from the community has recently emerged: some young boys move towards the urban areas for very short periods, with the scope of acquiring new skills – possibly through a period of apprenticeship – and then returning to the community. They do not send money home in the meantime, and thus remittances do not constitute a source of income for the households.

4.7. Environmental issues

The changes in livelihood strategies that are occurring in Northern Ghana are causing a number of important environmental problems, as the previous paragraphs have already mentioned, but only some of them are clearly perceived by people residing in this area. Bush burning, inappropriate farming practices, sand and gravel winning, felling trees, and surface mining are the main causes of environmental degradation.

The more worrying phenomenon is that of bush burning. Burning is embedded in the cultural values and traditional farming systems of the people[46], and the majority of them are not aware of the detrimental environmental consequences of this practice. To provide an example, the livelihood of the people from the Talensi Nabdam district depend on the forest, as it provides

[44] There is the general perception that in the entire district of Savelugu female migration towards the south of the country is increasing. The lower availability of salaried jobs, in comparison with the past, can be a plausible explanation of the phenomenon (DaDu/MOFA, 2007).

[45] In particular, there are a discrete amount of people who came from the 'Dagomba areas', that are located in the eastern part of Northern Region, to settle in Busunu.

[46] "In the Savannah region, soil and vegetation deterioration is caused by human activities especially bushfires. At the beginning of the dry season, herders often start fires to stimulate the growth of young shoots. According to herders, the regrowth or young offshoots are more palatable and contain more nutrients. Burning improves ranges because grazing animals frequently are found concentrated on burned areas where the herbage is more accessible, palatable and nutritious. Studies have shown that farm fires which heat the soil to 200°C are actually beneficial because the increase nutrient availability to plants. However, temperatures in excess of 400°C are detrimental because they completely destroy the soil organic matter and reduce the cation exchange capacity. Fires which burn large tree trunks or destroy heaped plant material at confined spots often reach temperatures in excess of the threshold value resulting in serious damage to flora, fauna and neighbouring property. However, bushfires causing volatilization of nutrients can reach extremely high temperatures, especially at the end of the dry season when vegetation is very dry. The effects can be damaging to soil structure and plant stability. A deterioration of the soil structure hinders the quick regrowth of plants and facilitates crust formation" (Nsiah-Gyabaah, 1996, p. 4).

resources that are used both for self-consumption and for their economic activities. The small timber poles and rafters are used for building houses and as a source of energy. The biomass fuel industry has recently boomed and the export of firewood and charcoal to towns has become lucrative, and the preservation of the forest is therefore threatened (MofA, 2006a). The wood of Namoo, that represents a property of the community, is very degraded, and there are fewer and fewer animals to hunt.
In Busunu, bush burning sometimes causes even the destruction of harvests. Moreover, selling charcoal is every day more convenient thanks to the expansion of trading activities, so felling trees has been increasing. According to the *West Gonja District Profile*, environmental degradation is reaching alarming stages in the part of the district that we visited. Not only tree cutting for fuel wood and bush burning, but also shifting cultivation or sand and gravel winning are threatening the ecological balance and the productivity of the soil. The situation seems particularly severe in Damongo, Achubunyor, Sori and Daboya areas (West Gonja D.A., 2006). The assembly man of Sori also admitted that deforestation is a big concern, because people burn a lot of trees. The problem is that there is a lot of virgin land in this area, so whenever soil fertility declines people leave their plot and go elsewhere to find new land.
In Bongo district, land degradation can be attributed mainly to inappropriate farming practices (intensive farming, overgrazing and constant removal of trees and shrubs without adequate replacement). High population density, bush burning and land excavation for roads and buildings construction also contributed to land degradation. The ensuing effects are worrisome: poor animals production due to the fodder reduction and siltation of water bodies. The desert is quickly approaching the district. Inhabitants of Lungo are conscious that the continuous cropping damages the soil and contributes to its infertility, but they believe to have no alternatives.
In the nearby district of Talensi Nabdam, sand and gravel winning, and surface mining are damaging a lot the environment, but they are however widely practiced, because they are a viable source of employment. The activities of the large number of contractors who win sand, gravel and stoves is increasing also in some areas of Jirapa. Over the years, over reliance on fuel wood for cooking and pito brewing, annual bush fires, constructions and inappropriate farming practices, caused considerable degradation of land in the district (MofA, 2006d). In Willing the land is becoming sandy.
Sugutampia is exposed to the danger of floods, like all the communities living near a river. In 1995, a flood destroyed the village. Farming along the river courses has also caused vast silting of the few drainage systems. Recent gravel winning on good farmlands alongside the major trunk road and sand winning is another issue of concern in all the Savelugu district, where the tree vegetation is decreasing rapidly.

4.8. Poverty, well being and role of women

In this paragraph, we briefly summarize people's perceptions about poverty, well-being and the role of the women, to understand whether they differ across communities, and whether they can offer the ground for some broad comparisons about self-reported well-being.

◊ Wealth and Poverty
Table 4.4 describes the answers to the questions concerning poverty and wealth. In all the communities people depict better off individuals as those who own livestock, confirming that this is the main indicator of household wealth. In the community of Die, people report that the number of heads of livestock represents the yardstick to assess the economic status of a member of the community. Food security is the second most frequent signal of prosperity. In Yilipani, a man argued that someone who is able to feed his family without resorting to the market - since he has a good harvest - is a privileged individual.
Farming and trading on a large scale are activities reserved to the wealthiest of the community. Also having beautiful houses (zinc roofed or made of stone) or being able to buy a motorbike, agricultural equipment, fertilizers or nice clothes are signs of a certain degree of wealth.

Table 4.4. Answers to the questions on poverty and well being in the sample communities

District	Better off individuals	Poor individuals
Namoo	- have food available all over the year - own a large number of livestock	- have small plot to farm - sell wood and charcoal
Lungu	- own instruments to plough the land - own livestock - farm on large scale - engage in trading activities - have food available all over the year	- have migrant member - suffer from food scarcity
Die	- own a large number of livestock - large scale traders	- can not send children to school - do not have sufficient land to cultivate - do not have relatives or friends supporting them when in need
Willing	- build beautiful houses - own a large number of livestock - able to buy motorbike and fertilizers - have employers who work in their farm	- are not able to work the land - spend their time to do nothing because they have no opportunities
Busunu	- have zinc roofed houses - have large farms - manage to send children to school until the secondary level (even if they do not report good results) - own livestock - own a lot of local clothes (expensive)	- are lazy people - are addicted to alcohol - "the poorest are idles because they do not have any capital to start any activity and live off their family in order to survive"
Sori	- have nice clothes - live in stone houses - own livestock - traders - large scale farmers - can buy a motorcycle - have health and food in excess	- are forced to ask their neighbors for financial support
Sugutampia	- have large amount of food - own animals - can send children to school until the last degree of education - have big plots of land (until 5 or 10 acres)	- are not in health - can not work - can not feed their family - are forced to beg in order to survive
Yilipani	- are able to feed the family without resorting to market - can send children to school - live in zinc roofed houses	- are not in health: "if you are strong, you can at still work, so there is no reason to say you are poor"

The differences between the communities emerge in the answers related to the school: if in Yilipani it is a privilege to send children to school, in Busunu the wealthier households are able to send to the secondary school even the children who do not report good results[47].
We find similar differences among the answers on 'poverty', where more heterogeneous perceptions emerge. An income-based definition of poverty is not widespread. Only someone considers poverty as lack of means or financial resources, e.g. land or credit, as a greater emphasis is placed to the most relevant consequence of poverty, that is the inability to meet food consumption needs. In Sori, people say that the poorest are the ones forced to look for financial

[47] In Yilipani there is not a primary school near the community, and this is one of the major complain of the villagers.

support from their neighbors. Conversely, other people portrait poverty as the lack of social capital: people who do not have good social relations are not able to receive any help in case of need.
In some communities, people trace back poverty to bad health conditions, that undermine one's ability to work. According to the women of Yilipani, there are not rich people in the community, but who is not in good health is poor: "if you are strong, you can at still work, so there is no reason to say you are poor", a woman said.
Only in two cases people answers to the question about poverty specifying what economic activities they associate to poverty: in Lungo migrants are considered the poorest, while in Namoo sellers of wood and charcoal are among the more deprived person.
Finally, in the more dynamic community, as Busunu, poverty is associated to laziness and alcoholism, so it is one's own fault to be in poverty rather than a consequence of the poor economic environment.

◊ Well-being
When people were asked to compare about their current well-being with the one they experience 20 years before, they appeared to be dazed hearing the question, and they did not know how to answer. Several people are not able to provide the reasons to explain why they feel better now: they simply say that that they are fine because they are still alive.
In all the communities the better access to health and school facilities and to potable water sources are mentioned as the factors determining the improving in well-being over the past two decades: also improvements in the road system are often mentioned. The availability of new techniques both for agriculture[48] and for non agricultural work, e.g. mill machines, are reported to be important for the well-being of the communities where these projects have been realized.
To provide an example, in Yilipani there have been several improvements, first of all in the access to water. In the past, they did not have drinking water, and women had to walk long distances to get it, while now they have some boreholes in the village. They have also a machine to grain the flower, maize and millet, while in the past they did it manually. The journey to Savelugu – the district capital - is easier, there are cars going there, so villagers have no more to cover all the distance on foot.
Only in Sugutampia, the majority of people stressed much more the negative changes, arguing that in the past they did not have to endure such difficult economic conditions. Moreover, in Willing, despite people recognize the benefits coming from the better infrastructural endowment, they said that these have been counterbalanced by the infertility of the soil, that made livelihood even more difficult.
Everywhere women are the ones who are better able to recognize and to evidence the developments and the positive changes that occurred in the every day life in their communities. The majority of the improvements are attributed to NGOs interventions, who built schools, clinics, boreholes all over the regions and promoted schemes to facilitate the access to credit, also with the aim of fostering the development of non farm activities, particular those practiced by the groups of women (see annex 2 for the details).
An interesting point was made in Sori and in Sugutampia, where people argued that they are now more "enlightened", thanks to the improvements in education and to the higher attendance to health facilities. Moreover, people are more willing to participate in projects for the benefit community, and this determined an improvement in the quality of life.

◊ Women
In Sori, people explicitly said that the major change concerned the role of women, that are now more involved in trading and agricultural activities, notwithstanding the resistance that men opposed, as they still regard women as being unfit to perform these tasks. This pattern is common in almost all the communities, although some differences emerged.
Women almost invariably affirmed to be more autonomous now because the roles of women and men are becoming more similar: women are now fully involved in all the farming activities, and

[48] As we already mentioned, in Busunu many progresses have been made thanks to the introduction of new technologies in agriculture.

contribute to livestock care. In the past, their farming involvement was confined to sowing, that is now practiced also by the men. Sometimes, like in Die, they do not have their own piece of land, but they work on the ones of the household; otherwise –like in Lungu - they have their own piece of land to cultivate. Only in Willing, women said that they would like to farm on their own, but men do not give them any piece of land.
Women from Lungu also form groups to help each other in case of need. In Sori, women said they now can obtain a loan from their colleagues, give a hand in farming and have machines that facilitate their food processing work. The availability of time is important: in Busunu – like in other places - nowadays trading is much more common because it is no longer necessary to spend a lot of time on collecting water, and gives the opportunity to women to engage in other activities.
In Die, it is now acceptable that women migrate, while in the past they were not allowed to do so. In Yilipani, Lungu and Busunu, women said that they do not anymore fear to express their opinion in front of men in the community meeting, and also within the family they have a greater role, being more involved in the education of the children.
Even men admit that these changes took place, acknowledging that women are more independent and autonomous than they used to be 20 years ago.

4.9. Conclusions

At the beginning of this chapter we reported what, according to Scoones (1998), represents the fundamental question a researcher using the sustainable rural livelihoods strategies framework has to address. This question can be divided in three components: what combination of livelihood resources people can dispose of? What combination of livelihood strategies do they follow? Which are the outcomes? After having provided a detailed description of the findings from the field study in Northern Ghana, we are now in the position to provide synthetic answers to these fundamental questions.
Natural assets are the fundamental resources for the people living in Northern Ghana. The land, the water sources, the vegetation and the trees constitute the basic elements upon which their livelihood strategies are developed. Unexpected shocks and a degradation of natural capital are particularly detrimental for them. Livestock represents often the unique form of financial capital that people have access to, and that is why wealth is always associated with the ownership of a large number of heads, and why veterinary services are deemed as essential. Physical capital is scarce, and it is basically constituted by the tools for farming, inputs, fertilizers and services to agriculture, as those provided by the extension officers services and mechanical ploughing. Lack of inputs and fertilizers is a major complain for farmers, while tractor ploughing is expensive and there are just a few irrigation systems in all the region, where advanced farming techniques are almost absent. Roads have been improved over the past decade or so for some of the sample communities, and this has improved the access to markets.
Social capital is represented by the reciprocal aid among villagers. The lack of good social relations with the village is a synonymous of poverty. The formation of groups can be considered as another form of social capital; such a practice is unevenly distributed, but it seems to be less frequent in the villages where there is a greater ethnic fragmentation.
Skills, education and labor force form the human capital. With regards to education, improvements have been recorded in the last years, since the access to school facilities has been enhanced by the improvement of the roads leading to the communities. The size of the labor force is increasing, but unevenly across districts. This can represents a window of opportunity or a major concern. Where the population density is higher, there are increasing pressure on land, and some workers can engage in other economic activities. Skills in agriculture are scarce: sometimes they are provided by MofA extension services, and ignorance about adequate farming techniques and about crop husbandry is all too common.
To sum up, the assets rural population can employ to earn a living are essentially the ones related to the environment where they live in. Despite the major contacts with the external world - due to the better roads and the openness of domestic markets to imported produce - the most important assets remain the ones related to agriculture. The opportunities to develop alternative strategies to the subsistence agriculture are scarce, given the limited set of assets. The real

problem is that on one side assets related to agriculture are worsening, and on the other side, they are not sufficiently counterbalanced by the emergence of assets that could contribute to the development of non farm activities.
Therefore, in order to answer the question concerning the strategies that these assets permit to undertake, the fist observation is that farming has an unquestioned central role in the livelihood of rural population in Northern Ghana. Livelihood security is still strictly intertwined with the outcome of farming activities. This is why the first concern that people have is to find ways to deal with the decline of land yields, resorting to what we defined as 'on farm diversification'. The ways to diversify in on farm activities are different, and they depend on the assets availability: intensification of land use is more common where the population density is high, while extensification is widespread where it is low and there is abundant land. The introduction of new crops is pursued where the extension services are better organized, and the use of more advanced techniques is adopted where there are enough funds to back these projects.
The floods that occurred in the Northern part of Ghana in September 2007, causing the destruction of a considerable part of the harvests – in addition to the destruction of houses and connections between villages, the spread of diseases and the death of more than twenty persons -, demonstrate that people who do not have a real alternative to subsistence agriculture are extremely vulnerable to the risks deriving from the unpredictability of natural events. As agriculture is performed on non irrigated land, it is highly dependant on the pattern of rainfall and only one harvest per year can be obtained. Whenever this is poor, people become net buyers of food, and the need for cash force them to sell livestock or to engage in off farm activities.
The need to earn money to buy food, clothes and other basic goods is the main push factor explaining the increasing of off farm activities in the region. Multiactivity, defined as the reliance on multiple sources of income, is becoming common for many households and communities in Northern Ghana. In many communities, the traditional activities practiced by men and women since a long time are now becoming market-oriented. This is one of the major changes occurred in the last decades: in some places, these activities became new sources of income for the households, and provided an essential contribution to survival.
The improvements in the road system, the opportunities created by the expansion of market activities and – to a lesser extent – the spread of new technologies, all contributed to the diversification in non farm activities that occurred over the past 20 years.
Population density also plays a key role in explaining the development of off farm activities, as there are greater opportunities to develop non farm activities in the more densely populated areas. This is in line on what Van der Geest (2003) observes on his field study area in the Upper West, where population density is insufficient to develop non farm activities, as "there are not enough people to sell".
The livelihood strategies that people adopt to cope with the environmental and institutional difficulties are influenced by the assets they have access to. Although the territory of Northern Ghana is rather homogeneous, we showed - both in the cluster analysis and in the field study - that there are important differences in the composition of assets across districts. We are aware that our sample is too small to be able to clearly differentiate among districts or clusters on the base of the most common response strategies, but we want to stress the links between certain assets and certain response strategies. The argument is that territories, communities and households with similar assets composition, have also similar livelihood strategies. We use our sample communities to illustrate some particular cases, that can be found elsewhere in the study area, because – given the methodology we used to select them – they cover a large part of the spectrum of asset compositions that we can find in the rural communities of Northern Ghana.
The sampled communities displayed a different degree of income diversification, and they differed with respect to the kind of off farm activities that are practiced. In the most densely populated areas, as the two communities in the Upper East Region, the most common strategy adopted by people to diversify their income is to start non farm activities, like food processing, trading, weaving and small scale mining. Also migration is a common form of diversification, although to a lesser extent, especially near the new mines, since people prefer to work there rather than to move further away from their own village.
In areas where the demographic pressure is lower, but the availability of fertile land is nevertheless scarce, as in Jirapa in Upper West Region, people seem to resort to migration

because there is not enough opportunity to develop non farm activities. In the two communities that we visited in Jirapa people said that diversification in non farm activities has not increased, but migration is now much more important than it used to be in the past.

We found a different situation in those areas where the population density is low and there is availability of land, like the western part of the Northern Region. In the focus group discussions in the communities of West Gonja district, farmers mentioned some problems related to land, but fewer than in the other districts. The most common strategies people adopt here to face difficulties created from the declining land fertility are extensification and moving to new plots of land, and the associated practice bush burning is becoming an increasing problem in this area. Still, even in these areas, non farm activities have been increasing in the last fifteen years, but people say they are more involved in these activities as they are now 'enlightened', and better able to grasp these new opportunities. So, we argue that here diversification in non farm activities could be explained mainly by pull factors, rather than by the push factors that are prevailing elsewhere. Migration is not so common here, as this has rather been destination for internal migrants, and this patter is reflected in the multi-ethnicity of some communities.

An important determinant of off farm diversification is the availability of financial capital, although our field study confirms that it is important to distinguish among the various alternatives to agriculture, as a link between poverty and migration clearly emerged. Yilipani, in Savelugu Nanton, is an example of an extremely poor community where the opportunities to develop alternative activities are scarce, and where men are thus forced to migrate seasonally. Internal migration, and especially rural-to-rural migration, does not require an initial investment of the household.

Remittances constitute a significant income source in some of the communities, and we argued that their role is particularly important where non farm activities are not diffuse. When poverty is the root cause of migration, remittances are used to satisfy the fundamental needs of the household. In Yilipani, for example, migrants come back with in-kind remittances, mostly food, rather than with cash, and just in a few cases people reported to be using remittances to undertake productive investments.

Thus, internal migration is a viable option even for the poorest households, while non farm activities are inaccessible for them: we argue that an inverted U relationship between income and the share of non farm activities in household income should be prevailing: non farm activities are not relevant for the richest households, who are generally large-scale farmers and owners of a large number of cattle[49].

Non farm activities have a strong relationship with farming, because most of them rely on some farm produce: this is the case of gari processing, pito brewing, dawadawa processing - made respectively from cassava, cereals and legumes - and of trading of food. In the focus group discussions, people clearly said that if you have to buy the raw materials, these activities become unviable, so that only farming households are able to undertake them. On the other hand, there are also some activities, like shea butter processing, weaving, mining or charcoal selling that are not dependent from the harvest. This differentiation is important in order to understand who is able to do what, because it is clear that these two kinds of activities do not bear the same relationship with poverty and assets composition[50].

Can we regard the strategies that households adopt as successful? Are the outcomes sustainable for the environment? These questions are fundamental to understand what will be the economic future of the Northern Ghana. From the household perspective, the strategies are successful in the short period when, say, farmers manage to obtain a harvest that suffices to feed the household, but this needs not to be the case. But here we are more concerned with the macro level: in the long period some of the most common strategies are not sustainable because of the damages they are inflicting to the environment. The intensification in the use of land, that contributes to reduce its productivity, or the development of mining sector and the diffusion of tree felling, all raise serious concerns about their sustainability. The development of off farm activities is largely the effect of push factors, and – although it is on the rise – we agree with

[49] As Table 4.6 evidenced, the only – minor - exception is represented by a few rich traders.

[50] This is a point that would deserve a careful investigation, preferably by means of a well-tailored household survey.

Yaro (2006) when he argues that what is occurring is not a process of deagrarianisation, but rather an attempt of people to adapt to the new environmental and institutional conditions through the adoption of new strategies.

In this chapter, we examined the determinants and the consequences of diversification using the communities as the main unit of analysis. In the next one, we shift our focus to the households, although some of the information we collected in the field study will still have an indirect role in the econometric analysis, as we will draw on it to formulate hypotheses and to interpret the results. Moreover, an even closer bridge between this and the next chapter is represented by an analytical innovation that we will introduce, namely the inclusion of variables drawn from the community questionnaires of the household survey we will employ.

5. Household-level determinants of income diversification

5.1. Data sources and methodology

We have already analyzed the determinants and the consequences of the diversification at the community and at the district level in chapter 4, while in this chapter we try to understand the determinants of diversification from a household-level perspective. The main objective is to investigate the factors that drive households' choices with respect to the set of possible income sources. We try to identify the common traits of the households that share the same sources of income, focusing on the relationships between household assets and activities. The connections between poverty, inequality and income diversification are also investigated.

5.1.1. Data sources

We draw our data from the third and the fourth round of the *Ghana Living Standards Survey*, GLSS3 and GLSS4 henceforth, conducted by the Ghana Statistical Service (GSS), that have been collected in 1991-92 and in 1998-99 respectively (GSS, 1995b; GSS, 2000c). This is a multi-purpose survey, which gathers information on several facets of the household living conditions, and it provides very detailed data on the patterns of household income and consumption. The survey covers a sample of 5,998 households[1] in 1998/99 and 4,552 in 1991/92, that is representative at the regional level. The list of the 1984 population census enumeration areas, which contains population and household information, was used in the process of sample design. The enumeration areas were first stratified according to the three ecological zones - coastal, forest and savannah - and then within each zone further stratification was conducted with respect to the rural or urban location.
The questionnaire is the same for both rounds, so that the data are directly comparable, but it has not been submitted to the same households, so that our data does not have a longitudinal dimension. Most analyses are conducted using GLSS4, but we also make use of GLSS3 data to investigate eventual changes in the relationships of interest over time. We use only the data collected in the rural areas of the three regions of Northern Ghana, thus restricting the sample to 600 households for GLSS4 and to 519 households for GLSS3.
Beside the data drawn from the household questionnaire, we also rely on information drawn from a community questionnaire that was administrated in every rural enumeration areas. This represents a major methodological innovation that provides us with relevant information on communal assets and infrastructures; such an innovation would have been unfeasible if we were to use the whole sample, as in the other regions it was not possible to match household with community-level data[2]. The main content of the community questionnaire regards the economic infrastructures, education and health facilities existing in the communities, as well as a description of any problems that affects the community well-being.

5.1.2. Econometric method

The major econometric tool in the multivariate analysis carried out in this chapter is represented by a multinomial logit. Such a model "can be thought as a simultaneously estimating binary logits for all possible comparisons among the outcome categories" (Long, 1997, p.149). It is suitable in situation where an individual can choose one alternative from a set of more than two, unordered and mutually exclusive choices. Consider a outcome y with n categories, and a vector $\mathbf{x}$ of independent variables. We are interested in how, ceteris paribus, changes in the elements of $\mathbf{x}$ affect the response probabilities. Multinomial logit models are multi-equation models, and the

[1] "For the purpose of the survey a household was defined as a person living alone or any group of persons staying together and sharing the same catering arrangements" (GSS, 2000b, p.1)
[2] Each enumeration area can contain more than one rural communities, and the GSS does not disclose the information that would allow to attribute each household to its community; in the three Northern regions, luckily we have only one community for each sampled rural enumeration areas, while this correspondence breaks down for most of the other regions.

system of equations cannot be unequivocally identified unless the vector of coefficients referring to one of the *n* categories – the reference category – has all its elements set to zero. Each equation is a binary logistic regression comparing a category with the reference category. The theoretical probability for each of the *n* outcomes of the response variable *y* are defined as follows:

$$\Pr(y=i)=\frac{e^{\beta_i' x_i}}{\left[\sum_{i=1}^{n} e^{\beta_i' x_i}\right]}, \text{ with } \boldsymbol{\beta_i} = (0,\ldots,0).$$

The above system of equations implies that the ratio of the probability of an outcome over the the reference outcome is given by:

$$\frac{\Pr(y=i)}{\Pr(y=1)}=e^{\beta_i' x_i}, \text{ with } i = 2,\ldots,n.$$

Thus, the vector of coefficients β_2 represents the log odds of the response variable taking the value y=2 relative to the reference outcome (Ender, 2003). Note that this model has an important limitation: it has to satisfy the so called 'independence from irrelevant alternative' assumption. Relative probabilities for any two alternatives do not change when we add a further alternative to the set of possible outcomes (Wooldridge, 2002). We will rely on a Hausman test to assess the plausibility of the restriction that is imposed on the estimates[3].

5.2. Livelihood in Northern Ghana

5.2.1. Some descriptive statistics of sample population

Here we briefly describe some basic features of our sample population. Northern Region is the largest region and accounts for more than half of the sample population, while population density is higher in the Upper East region. In GLSS4, slightly more than half, 52 percent, of the sample is male, differently from the rest of the country where we have a larger share of females. More than 88 percent of the population is illiterate, and only 4 percent of it has completed more than nine years of education. The distribution of population among ethnic groups and religions is shown in table 5.1.

Table 5.1. Distribution of the sample population according to ethnic groups and religions

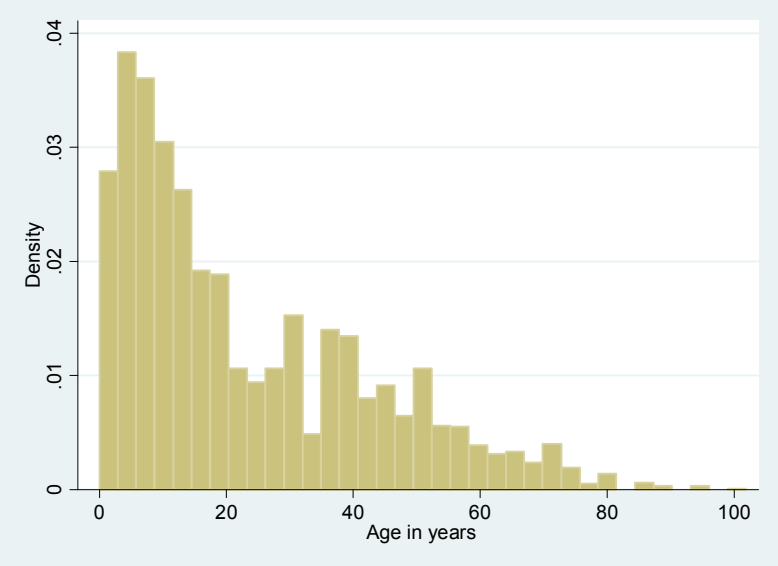
Ethnic group	Percentage	Religion	Percentage
Dagarti	20.0	Catholic	24.2
Gonja	12.0	Muslim	34.3
Dagomba	7.7	Traditional	24.4
Kusasi	9.0	Other Christian	5.0
Frafra	7.7	No religion	3.9
Konkomba	7.3	Pentecostal	3.0
Others	36.2	Others	5.3

Source: author's elaboration on GLSS4

Figure 5.1 shows the age structure of the population, that is highly skewed towards younger age groups. Approximately half of the population is less than 20 years old, and the modal age group is between 3 and 6 years of age.

[3] Hausman and McFadden (1984) apply the Hausman principle that compares the estimate of β using all alternatives to the estimate using a subset of alternatives.

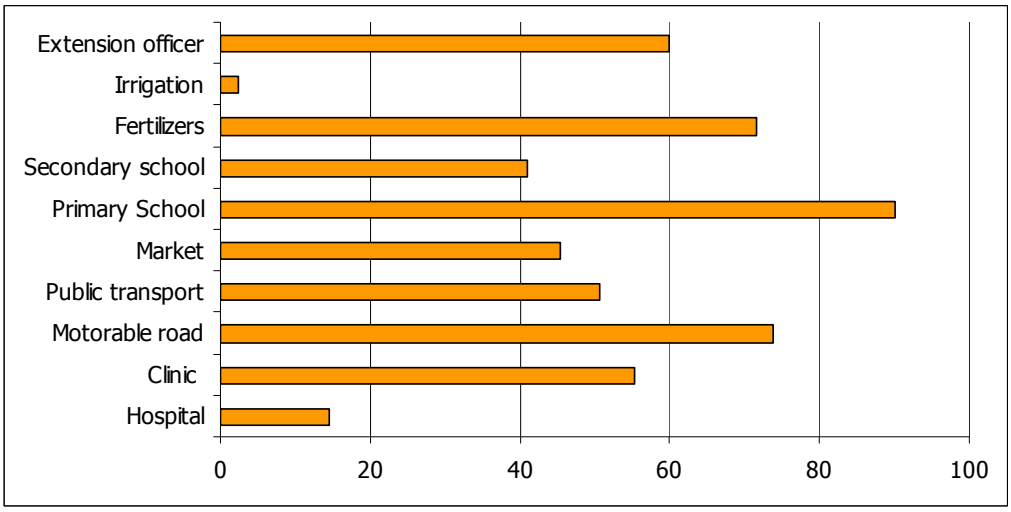
Figure 5.1. Age structure of the sample population



Data source: author's elaboration on GLSS4

The community questionnaire recorded information on the access to services. We report in figure 5.2 the percentage of households having access to some of them. In almost all communities there is a primary school, while the junior secondary school is not easily accessible to a large number of households. There is still a large percentage of communities that are not reached by a surfaced road, and this determines that they are often inaccessible during the rainy season. Not all the communities where there is a surfaced road are served with public transport, although the correlation between the two variables is high. A daily or a periodical market is present in many communities, and the variable is highly positively correlated with the presence of the public transport.

Figure 5.2. Households having access to some services - Percentages



Data source: author's elaboration on GLSS4
Note: sample weights have not been applied.

More than half of the communities are usually visited by extension officers. The percentage of communities where there is at least a farmer who use chemical fertilizers is high, but quite

interestingly this is positively but not highly correlated with the presence of an extension officer. Irrigation systems are dramatically lacking in the rural Northern communities, as figure 5.2 evidences. The presence of small clinics[4] within an hour distance is quite common in the sampled communities, whereas hospitals serve a very limited number of households. The lack of appropriate medical assistance is indeed one of the main problems in service provision in Northern Ghana.

5.2.2. Livelihood strategies of sample population

The first step in the analysis of livelihood strategies is to identify and to define the relevant income sources. Agricultural incomes are all the incomes from farming either for self-consumption or for selling non processed crop products in the market, plus the earnings derived from various activities related to agriculture, as the sale of eggs, honey or milk.
We maintain that an household has an income from non farm activities if it derives its income from at least one of the following sources[5]:

a) non farm self employment income;
b) revenue in cash from non farm enterprises;
c) revenue in goods and services from non farm enterprises;
d) wages from employment;
e) revenue from the sale of processed crop products.

This definition is partially different from the one given by the GSS, which includes the last income source in the definition of 'agricultural income'. But, consistently with the findings of the field study, we rather regard the sale of processed crop products as a non farm activity, since it requires an additional, and often substantial, effort besides the one devoted to farming, and it may requires the use of specific tools.
According to GLSS4 data, the most common non farm activity is retail trade. Beverage industries and food manufacturing are widespread. Minor activities are represented by manufacturing of pottery and of wearing apparel and repair services. These activities are generally practiced as a second job. 5.20 percent of households have a wage from employment - generally in the public sector - and half of them are engaged in the educational system.
We consider remittances as a distinct income source, rather than pooling them with the incomes from non farm activities. Remittances are defined as the transfers received from any source outside the same village where the household resides, as these are unrelated to migration and rather reflect a system of reciprocity among households. Since all the households in our sample have some income from agricultural activities, we classified households in four mutually exclusive classes according to their income sources:

1. households who have an income from agricultural activities;
2. households who have an income from both agricultural and non agricultural activities;
3. households with an income from both agricultural activities and remittances;
4. households who have all the three sources of income.

A non negligible contribution to income of Northern Ghana households is rental income. But we decided to not consider it in our analysis because it is almost entirely constituted by imputed income for house owners[6], while we are interested here in the income generating activities. The remaining sources of income account for just a negligible share of total income (see section 5.5).
The distribution of the households in the four income categories has changed between 1991 and 1998, as we can see in table 5.2.

[4] In the clinics there are no doctors but only nurses, and some primary assistance is provided.
[5] The basic aggregates we use in the analysis have been constructed by the GSS.
[6] The other components of rental income are income from renting out livestock and agricultural equipment; only 3.17 percent of households have an income from renting out livestock and 0.8 percent have an income from renting out equipment, while none of the sample households has an income from renting out land.

Table 5.2. Distribution of households according to their livelihood strategies

Livelihood Strategy	**1991/92 (percentage)**	**1998/99 (percentage)**
1. Only agricultural income	31.13	31.20
2. Agricultural and non agricultural income	48.19	37.93
3. Agricultural income and remittances	6.61	15.86
4. Agricultural, non agricultural income and remittances	14.07	15.01

Source: author's elaboration on GLSS3 and GLSS4

The decrease of the percentage of households with income from non farm activities between the two surveys is unexpected, and puzzling. All the other data sources[7] - first of all the data collected in the two *Core Welfare Indicator Questionnaires*[8] (GSS, 2005) – rather suggest that income diversification in non farm activities has certainly increased over time in the study area.
The observed decrease of non farm activities may be due to a different sampling design between the two rounds of the survey, as some data point along this line of explanation. For instance, in GLSS3, 55 percent of the communities hosted a market, while in GLSS4 this percentage dropped to 40 percent. It is possible that in GLSS4 survey more remote communities have been over-sampled. Unfortunately, we do not know the exact location of the sample communities, so that we cannot test this hypothesis any further, although we argue that it is plausible.
The most impressive change between the two surveys is the increase of income from remittances. Usually the households receive remittances by only one person, but there are a few cases where remittances are sent by more than one household member. They are sent both in food and in cash.
It is interesting to analyse the characteristics of the remittances sent to the third and the fourth group of households, in order to understand if there is any difference among them.
The median amount of remittances is the same for the two groups (80,000 cedis). For the group adopting the third strategy, remittances are received from close relatives (parent, spouse, child, brother or sister) in 81.7 percent of the cases, and from other relatives in 18.3 percent of cases. For the fourth strategy, the percentage of remittances sent by close relative is higher (86.9 percent). In this group also the percentage of remittances sent by women is higher: 26.7 percent compared to 22.8 percent for the other group. Remittances are more regular for the first group (50 percent are transferred on a monthly, quarterly or annual basis); instead for the fourth group only 32 percent are sent on a regular base.
Another relevant difference concerns where the individuals who send remittances live: for the third group, 52.49 percent lives in urban areas, 34.14 percent in rural areas and 13.37 percent of remittances comes from abroad (of whom 11.9 from other African countries). The percentage of people living in urban areas is higher (61.98 percent) for the fourth group, and only 21.14 percent of the remittances come from rural areas, while the percentage of migrants living abroad is 16.88, with a major incidence of people living out of Africa (3.19 per cent). The differences in the geographical origin of remittances could be an indication of the differences in migrant's jobs, and skills. To sum up, in the fourth group remittances are less regular, mainly coming from close relatives, who are more often female and live in urban areas.
From the data we showed, it is clear that the role of international migration in Northern Ghana is very small, especially if we consider that migration toward other African countries is more similar to the domestic migration than to the international one[9].

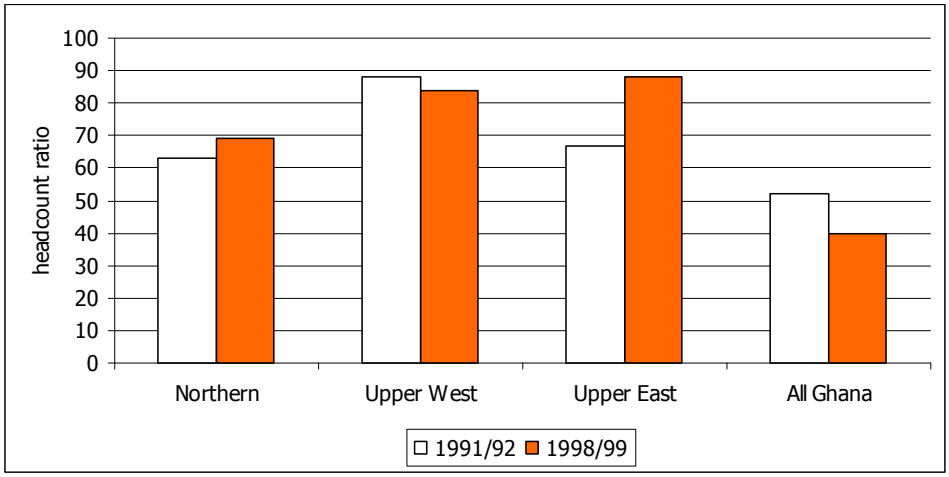
[7] See chapter 3 for a review of the studies and data sources showing the increasing importance of non agricultural activities and remittances in household's incomes.
[8] See table 3.4 in chapter 3.
[9] For a treatment of migration flows across West African countries, see Adepoju (2005).

5.3. Poverty in Northern Ghana

5.3.1. Who are the poor?

Poverty has been falling in Ghana in the 1990s, but poverty reduction has been concentrated in Accra and in the forest areas, while the savannah has not recorded a significant reduction in the incidence of poverty (see chapter 3), and it still hosts 37 percent of the Ghanaian poor.
GSS measures poverty with a set of different indicators, with an extreme poverty line and upper poverty line, that are both estimated according to the minimum subsistence needs of the population (GSS, 2000a). The upper poverty line has been constructed including both essential food and non food consumption, and it is set at 900,000 cedis per adult per year, while the extreme poverty line considers what is needed to meet only the nutritional requirements of households members and it has been set at 700,000 cedis per adult per year; both lines are defined with respect to the prices prevailing in Accra in January 1999, and the GSS provides the factors required to account for inflation and for the geographical variations in prices[10].
Figure 5.3 shows the poverty headcount ratios[11] using the upper poverty line in the three Northern regions and for the whole country for both surveys. The figure clearly shows the sharp increase in poverty incidence in the Upper East Region, which is indeed the poorest region of the country. The gap with the rest of the country is large and has increased over time.

Figure 5.3. Poverty headcount ratios in 1991/92 and in 1998/99, by regions.



Data source: GLSS4. Note: poverty line set at 900,000 cedis.

The percentages of sample households having an income below the extreme poverty line, between the extreme and the upper poverty line and above the upper poverty line are reposted in table 5.3. The percentage of 'non poor' is small indeed, especially in the Upper West and Upper East regions.

Table 5.3. Distribution of households according to their poverty status.

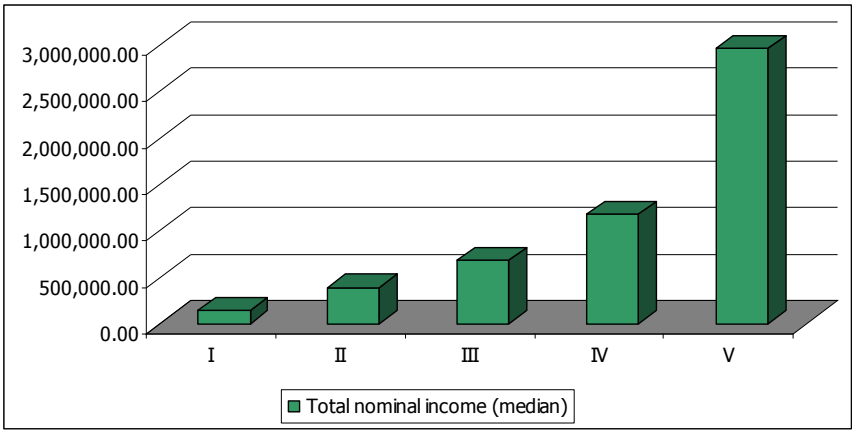
Region	Below the extreme poverty line (percentage)	Between the two poverty lines (percentage)	Above the upper poverty line (percentage)
Northern	54.74	11.15	34.12
Upper West	76.63	11.24	12.13
Upper East	79.31	10.25	10.44

Source: author's elaboration on GLSS4 data

[10] The exchange rate between the US dollar and the cedi stood at 368 cedis per dollar in 1991, 437 in 1992, 2,314 in 1998 and 2,669 in 1999 (World Bank, 2006).
[11] Computed for the overall sample of Northern Ghana, that is considering also the urban areas.

Figure 5.4 shows the median values of the household nominal income across income quintiles. The first and second quintiles are below the extreme poverty line, while only the fourth and the fifth are above this poverty line.

Figure 5.4. Nominal household income across quintiles of the income distribution - Cedis



Source: author's elaboration on GLSS4

Besides the overall pattern of poverty in the region, we are particularly interested in the relationship between poverty and economic activities. In the whole Ghana, poverty is highest among the food crop farmers: around 58 percent of poor in Ghana are from households primarily engaged in food crop cultivation. And even for export farmers the poverty headcount ratio is high, although it decreased in the 1990s. On the other hand, around 24 percent of the poor are from households whose main income source is non farm self employment (GSS, 2000a).
In the three Northern Regions, the situation seems similar, since the largest concentration of poverty is among farmers. In table 5.4, we report the poverty headcount by income sources groups, that is the percentage of households below the extreme poverty line in each livelihood strategy group.

Table 5.4. Household income and percentage of households below the extreme poverty line in 1998/99, according to the livelihood strategy

Livelihood strategy	Median household income, cedis	Percentage of households below the extreme poverty line
Only agricultural income	436,173	75.42
Agricultural and non agricultural income	1,169,576	52.12
Agricultural income and remittances	389,943	76.73
Agricultural, non agricultural income and remittances	844,437	60.85
All	686,285	64.60

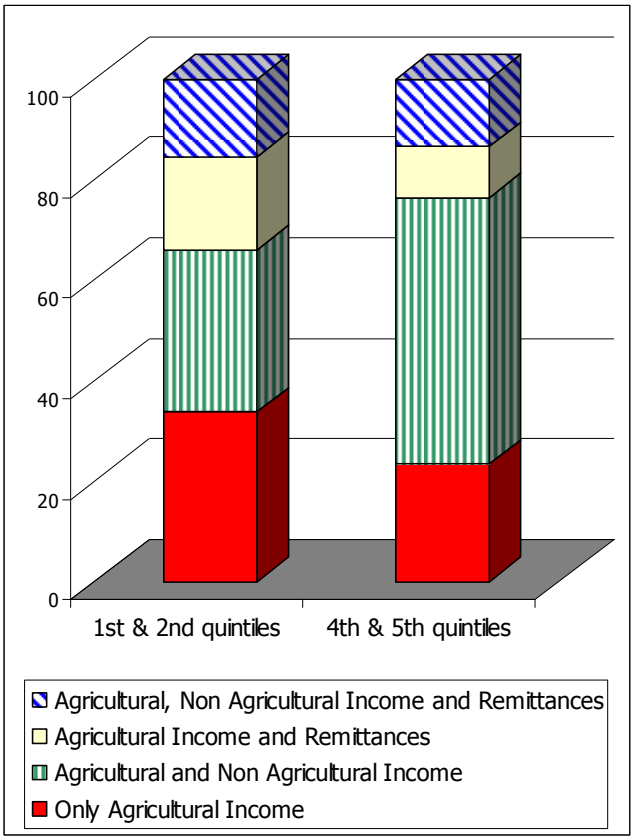
Source: author's elaboration on GLSS4

The households with an income from non agricultural activities generally have an higher income and the incidence of poverty in their groups is lower; households that draw their livelihood from farming activities alone are the poorest group, together with the households who receive remittances.
This table suggests that migration is used as a coping strategy rather than as an accumulative strategy, and that it seems to be unlikely to improve the household socioeconomic status. This pattern could be explained by the kind of migration prevailing in the region. As we observed in section 5.2.2, migrants move inside the country, or at most toward other African countries, so we mainly deal with 'domestic migration', that often does not offer opportunities to move out of poverty. As Mendola (2008) well explains:

> "Asset-poor farm households are more likely to enter into domestic migration, which has lower entry costs, and lower absolute returns. […]. Lack of resources needed to bear the cost of migration may generate a poverty-trap whereby only better off households are able to exploit a virtuous circle of complementarities between overseas economic opportunities and productive activities at origin." (p.168)

The welfare status of the households can be better assessed in figure 5.5, that shows the share of households adopting each livelihood strategy in the first two and in the last two quintiles of the income distribution.

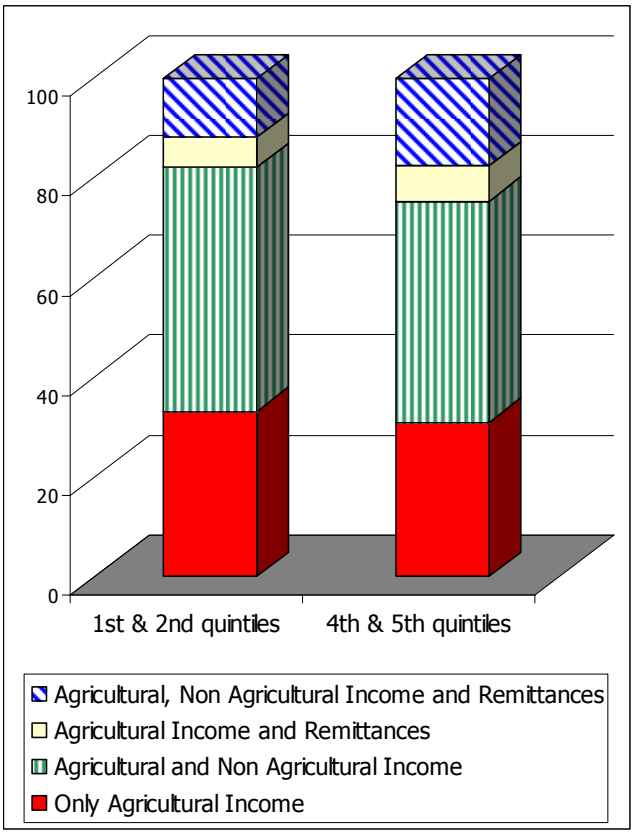
Figure 5.5. Percentage of households involved in each livelihood strategies across income quintiles in 1998/99



Source: author's elaboration on GLSS4

Most households without non agricultural incomes belongs to the first two quintiles of income; the situation seems to be better for households with both agricultural and non agricultural incomes (group 2): 53 percent of them are in the last two quintiles.
GLSS3 data show that households who have an income from non farm activities were poorer in 1991/92. This is interesting because it indicates that despite the decrease of the percentage of people involved in non farm activities (cf. section 5.3.2), there has been an increase in the return to these activities between the two surveys.
Conversely, households who received remittances in 1998/99 – even though they represent a greater share of the rural population - were located in lower income quintiles than in 1991/92. Moreover, it is interesting to observe that the percentage of households receiving an income only from agricultural activities located in the higher quintiles has reduced over the time period.

Figure 5.6. Percentage of households involved in each livelihood strategies across income quintiles in 1991/92



Source: author's elaboration on GLSS3

5.3.2. Determinants of poverty

To analyze the determinants of poverty we estimate an OLS regression model (table 5.5), where the dependent variable is the logarithm of the welfare index[12]. A first specification includes as explanatory variables some household characteristics, like the number of adult members (aged 15 and above), the dependency ratio[13], and the highest level of education among household members[14], as well as some variables indicating the asset composition of the households, like the size of the farm[15], the ownership of livestock[16], and the ownership of agricultural equipment[17]. Credit was not included among assets because only very few households have access to credit[18].

[12] The welfare index is the total household consumption expenditure per equivalent adult at constant prices in Accra in January 1999. This index ranges between 118,358 cedis and 8,509,789 cedis, with an average of 738,015 cedis and a median of 541,856 cedis.

[13] Defined as the number of dependent members (0-14 years and above 65 years) on total household size.

[14] The variable 'highest level of education' has been defined as an ordered variable taking value 0 if none of the household members has at least 6 years of education; 1 if at least one of the members has attended school for 6 years; 2 if at least one member has attended between 7 and 12 years of school; and 3 if at least one member has attended more than 12 years of education.

[15] The variable 'farm size' refers to the size of the farm owned or operated by household members and is measured in hectares.

[16] The variables 'livestock' is a dummy and takes value 1 or 0 if the household owns or not livestock (draught animals, cattle, sheep or goats), respectively.

[17] This variable is a dummy and takes value 1 if the household owns any agricultural equipment (tractor, plough, trailer/cart, other animal drawn equipment, other tractor drawn equipment, sprayer, outboard motor, canoe, net, safety equipment) and 0 otherwise.

[18] Only 98 households in the sample stated they have received a loan, mostly from relatives, friends or neighbours and only 9 from traders. Generally, no collateral has been asked for the loan. 70 of these loans are less than 200,000 cedis. And 84 have not been completely settled. People use credit mainly for business expansion and consumer goods purchase; a lower percentage for ceremonies, health and agricultural inputs.

In the second specification, we include in the model also the regions as geographic variables, taking the Northern Region as the reference one, since this is the most densely populated.
The estimates show that:

1. the increase of the number of adults in the household reduces the welfare index, that is also decreasing in the dependency ratio; that is to say, larger households are generally poorer;
2. farm size has the expected positive effect on the welfare index; owning livestock has a positive impact on the welfare index because it captures their role as store of wealth; agricultural equipment is positively correlated with the welfare index because it contributes to the productivity of farming activities; as expected, a wider asset portfolio increases welfare;
3. the effect of education on the welfare index is positive;
4. the variable 'Region' shows that there are not statistically significant differences between Northern Region and Upper West, while household living in the Upper East Region have a significantly lower welfare index.

Table 5.5. Determinants of poverty, measured by the logarithm of the Welfare Index

	Specification 1	Specification 2
Variable	coefficient (z-test)	coefficient (z-test)
Adult members	-0.199 (10.12)***	-0.198 (-9.22)***
Dependency	-0.839 (-6.80)***	-0.855 (-7.12)***
Farm size	0.005 (2.30)*	0.004 (2.21)*
Livestock	0.089 (1.67)*	0.125 (2.36)**
Equipment	0.401 (5.49)***	0.342 (4.69)***
Education(1)	0.240 (2.53)**	0.197 (2.12)*
Education(2)	0.114 (1.96)*	0.074 (1.24)
Education(3)	0.515 (3.49)***	0.457 (3.43)***
Upper West Region		-0.067 (-0.95)
Upper East Region		-0.300 (-5.93)***
Constant	13.976 (155.94)***	14.088 (153.32)***
Observations	600	600
R squared	0.3166	0.3530
F statistics	22.54***	21.75***
Root MSE	0.55216	0.53818

Notes: ***, ** and * denote significance at the 1, 5 and 10 percent confidence level respectively.

We also included the variable 'enumeration area' or 'district' in the estimation (not reported in the table); they are greatly significant: this means that part of the variability in the welfare index is well caught by the geographical variables. This is confirmed by the difference between the Gini

More than 60 percent of loans have been received by households practicing non farm activities. No information is available on credit requested and not granted.

index computed among the communities - that assumes an equal income distribution within each community - and the Gini index within communities; this latter index has been computed after rescaling household incomes so that any income disparities across communities has been removed. The value of the *Gini between* is 0.38, while the value of the *Gini within* is 0.28, so that income inequality between the communities is higher than the corresponding inequality within communities; this strengthens the argument about the relevance of the community-level analysis, as there is evidence of a notable degree of homogeneity in welfare levels within the various communities.
To summarize, the household welfare index is determined by the size of the family and its dependency ratio, the assets mix (land, livestock, equipment), and the educational level of its members[19]. When we add to the model a variable indicating the location of the household, it is confirmed that the poorest ones live in the Upper East Region.

5.4. Income inequality in Northern Ghana

Following Morduch and Sicular (2002), we use the Theil index to decompose the income inequality, in order to assess the role played by each type of income in increasing or decreasing inequality. The Theil index is better than the Gini index to analyze this issue, because it does not give rise to any residual term once it is decomposed. We can compute the Theil (1967) index for each income component *k* as:

$$T(Y^k) = \frac{1}{n}\sum_{i=1}^{n}\left[\left(\frac{y_i^k}{\mu_y}\right)\ln\left(\frac{y_i}{\mu_y}\right)\right]$$

where *n* is the sample size; the subscript i indexes the households, y_i is the total per capita income; y_{ik} is the household income from component *k* and μ_y is the mean total per capita income. The Theil index is given by the sum of the indexes defined on each component, and it ranges between 0 and ln(*n*).
To compute the index, we use the classification in income generating activities made by GSS, so we consider the following possible sources of income: income from employment, agricultural income, non farm self employment income, rental income, income from remittances and other incomes. We have slightly modified the definitions given by the GSS, in order to make the original classification more similar to the one we are using. For this reason, we include net revenue from the sale of transformed crop products among the non farm self employed income activities[20].
The results are summarized in the table 5.6, where is also reported the contribution of each income source to total income. The value of the Theil index decreased over the period, being 0.19 in 1991/92 and 0.17 in 1998/99.
The weight of agricultural income on the total is very high in both surveys, so that this income source is able to explain a large part of total inequality. However its weight is lower in 1998/99.
We can observe that the sign of the income sources related with non farm activities is positive and this indicates that they reflect a contribute to increase inequality. We also notice that the share of non agricultural activities to total income increased between the two surveys, while their contribution to income inequality decreased, so that we can suppose they became more accessible.
Contribution to inequality of the income from employment is particularly high in 1998/99. This could be easily explained: there are only a few households receiving this income, but it is very high. This category includes mainly public employees, who have a wage that is well above the average income.

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[19] Admittedly, some of the former relationships suffer of a problem of double-causality, as it is unclear which way the causality goes; although we are aware of this problem - that actually plagues most of the econometric literature on this topic – survey data regrettably offer limited opportunities to, say, resort to valid instrumental variables to deal with the possible endogeneity problem.
[20] See appendix 4 for a clear explanation of which are the components of GSS classification and how we slightly modified these components.

Table 5.6. Percent contribution of income sources to total inequality (Theil index) and percent contribution of income sources to total income.

Income sources	Contribution to income inequality in 1998/99	Contribution to total income in 1998/99	Contribution to income inequality in 1991/92	Contribution to total income in 1991/92
Income from employment	38.95	3.9	14.51	5.5
Agricultural income	44.96	61.2	58.31	75.3
Non farm self employed income	17.99	15.9	25.56	7.4
Rental income	-0.83	4.5	-0.32	9.4
Income from remittances	-0.95	12.0	0.87	2.2
Other incomes	-0.12	2.5	1.06	0.2

Source: author's elaboration on GLSS4 and GLSS3

Regarding income from remittances, it is important to note that, not only the number of households receiving remittances had a large increase, but also their contribution to total income raised. The sign of the income from remittances in 1998/99 is negative, indicating that they contribute to reduce inequality (because they are mostly received from those households with an income below the average), but this is a recent phenomenon.
Rental income contributed to reduce inequality both in 1991 and in 1998: this apparently anomalous result can be easily explained: GSS includes the imputed rents for households owner in the 'rental income' category (see section 5.2). The rent is imputed to all the owner households in order to better measure the standard of living: even if the houses provided rent free are excluded, we are aware that in Northern Ghana almost all households own the house where they live, despite their welfare level.

5.5. Some working hypotheses on the determinants of income diversification

Here we present some working hypotheses on the expected relationships between household characteristics, its assets, the characteristics of the place where the household lives, and the income strategies it undertakes, that we are going to test in the next paragraph using multinomial logit analysis.

◇ Households characteristics[21]

Working age members
A larger household has stronger incentives to search for alternative sources of income, behind the agricultural activity. But, since only in an household where the number of adult member is sufficiently high there are the human resources available for non farm activities, we expect this variable is positively correlated to the probability of having an income from non farm activities (both strategies 2 and 4). "The more labor available to a household the more likely households

[21] Regarding the household's characteristics, there is a certain agreement in the literature in acknowledging that female headed households have a lower propensity to participate in non farm activities and that - on the contrary - they are more likely to receive both private and public transfers (Davis *et al.*, 2007). On the other side, some studies have recently emphasized how the participation of woman on non farm activities is increasing: in Sub-Saharan Africa, women participate to a greater degree than before in wholesale or retail trade and in manufacturing, in particular in the informal sector. And they are often involved in activities with a lower start-up capital than those practiced by men (Gordon and Craig, 2001). Bryceson (1999) argues that gender barriers to participation in a wide set of activities are rapidly declining. Although the field study suggests that a similar process is occurring in Northern Ghana, we choose to not include sex of the household head in our specifications because we are not able to make clear hypotheses on its effect on our four possible livelihood outcomes. In fact, if we test for the differences in the sex of the household among the four outcomes, we do not find any significant result.

are to participate in, and receive higher returns from, all activities, and particularly non farm activities" (Davis *et al*., 2007, p. 29).
On the contrary, according to the literature, households receiving remittances have, on average, a smaller number of members. Still Davis *et al*. (2007) argue that: "transfers, which are often provided to the elderly by the government and via remittances to parents, […] would tend to have smaller households" (p. 29).
The same conclusion is drawn by Adams (2006): in his study on remittances and poverty in Ghana, he found a negative impact of the household size on the probability to receive domestic remittances[22]. Thus, we expect that the smaller is the number of working age members, the higher the probability to have an income from remittances[23].

Dependency ratio[24]
An high dependency ratio contributes to raise the incentives to search for an alternative sources of income. Therefore, diversification in off farm activities are pushed by the high number of dependents. But, it is easier that households with an high dependency ratio are involved in non farm activities, since they could be carried out by children and elderly and they do not require moving from the village.
Instead, when the dependency ratio is high, adult members are not able to leave the household in search for a better job, since they have to take care of children and elderly people, so the households are less likely to receive remittances[25].

Age of the household head
In some studies the age of the household head is included among the determinants of income diversification. The age of the household head is generally supposed to have a negative impact on the probability to have an income from non farm activities and a positive impact on the probability to receive remittances. We embrace these hypotheses, although these relations are only seldom confirmed in the empirical studies. For example, Corral and Reardon (2001) find a positive and statistically significant impact of the age of household head on wage employment, but not significant for self employment; Escobal (2001) finds no significant effect. On the contrary, Berdeguè *et al.* (2001) obtain a totally different result in Chile, where the households headed by a female or by an elderly person have an higher probability to receive non farm incomes.

Income level
We showed that non farm activities in Northern Ghana are inaccessible for the poorest, who are not able to overcome the entry barriers, even if they are low (cf. section 4.5). Therefore, we hypothesize a positive relation between income level and the probability to be engaged in non farm activities[26].
While we hypothesize a negative relation between income and remittances receipt (group 3), since poorest households are able to diversify only through migration.

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[22] On the contrary, Smith (2000) observes that extended families positively influence the probability to migrate. Also Reardon (1997) states that households are able to send migrants out without affecting domestic production only if they have a sufficient labor supply.
[23] We are aware that this negative relation could have endogeneity problem, being influenced by the migration of a member.
[24] Dependency ratio is not correlated to the number of working age members, while it is strictly correlated to the household size.
[25] The same argument is suggested by some studies maintaining that households with fewer children under age 5 are more likely to participate in migration (Adams, 1993; Lipton,1980).
[26] We are aware that the introduction of a variable measuring the income level as a determinant of income diversification presents a not negligible problem of reverse causality: we hypothesize that wealthier households are the ones who would most probably undertake non farm activities, but we could also maintain that who is engaged in such activities receives an higher income. Despite this problem, we decided to include this variable in the model because both the findings of the field study and the analysis on poverty and inequality in Northern Ghana illustrated in the previous paragraphs, suggest a clear positive relationship between income level and non farm activities. See also Jonasson (2005) for an analysis between non farm rural activities and income.

Finally, we suppose that households belonging to group 4 lie in between the better off and the poorest: they are able to undertake non farm activities with the support of relatives, who send them a certain amount of money.
In order to have an indicator of the income level, we use the variable 'poverty status', that can take the values 0, 1 and 2, if the household is below the extreme poverty line, between the extreme and the upper poverty line or above the upper poverty line, respectively.

Home production
We computed the share of consumption of home produced food in household expenditures. This indicates the percentage of household's needs that is covered by resources directly produced by the household. If it is high, we can argue that there are a few available resources to undertake non agricultural activities.
At the same time, with an high percentage of consumption of home produced food, there is not an urgent need to receive incomes other than agricultural ones to supplement the household's basic needs. In other words, among the households having only agricultural incomes, we expect that the ones who do not manage to cover their basic needs with home production are mostly in need and ask for money to relatives and friends.
Therefore, we expect a negative relationship between self-consumption and all income sources other than agriculture.

Education
We argue that education is important to explain why a household undertakes a non farm activity[27]. In the focus group discussions, people reported that education means creativity and entrepreneurship. Educated people have a better awareness of existent opportunities and a greater ability to grasp them. "Education is often the most valuable asset for rural people to pursue opportunities in the new agriculture, obtain skilled jobs, start business in the rural non farm economy, and migrate successfully" (World Bank, 2007, p.9).
Moreover, through education, they acquire skills that can prove useful in some non farm activities. We expect that primary education has the strongest effect in increasing the probability to have access to a non farm income; secondary and tertiary education are relevant only for certain professions.
The literature does not identify a clear relationship between education and income from remittances. Part of the literature on the determinants of migration finds a positive or a U-shaped relationship between education and the probability to migrate, although this applies specifically for international migration (Stark, 1991). Educational level of domestic migrants is not so different from the average level of their country. In their field studies in Ethiopia, Bangladesh and Mali, de Haan *et al.* (2000) found that the differences between migrants and non migrants in terms of education were not significant.
In Northern Ghana, migrants are generally not employed in qualified jobs, especially if they migrate to other rural areas. But, an higher education level is required in order to migrate to urban areas. Since the number of the migrants in the sample who send remittances from urban areas is quite consistent, especially in group 4, we suppose that a higher education level increases the probability to receive remittances[28].

◇ Household assets
According to the literature, the asset mix is one of the most important factors determining the accessibility to non farm activities. Households having access to a better asset mix are able to better diversify their incomes. De Haan *et al.* (2000), for example, point out that physical assets composition explain a large part of propensity to migrate.

[27] This hypothesis is consistent with a certain number of studies showing a positive relationship between education and non farm activities. See for example: Taylor and Yunez-Naude (2000) for Mexico, Adams (2006) for Ghana, Berdeguè *et al.* (2001) for Chile and Lanjouw *et al.* (2001) for Tanzania.
[28] Note that we are not able to properly assess the impact of education on remittances, because we do not have information on the level of education of migrants. So, our hypothesis is that the educational level of the migrant is the same as – or lower than – the highest education among his relatives. In fact, the highest level of education among the household members is the indicator of education that we use in the model.

Livestock and agricultural equipment
A household that owns livestock or agricultural equipments has the resources to undertake non farm activities. In fact, livestock is the most important financial capital of a household (cf. section 4.4.4). Ownership of agricultural equipments is another indicator of the wealth status of the household. Therefore, we expect these variables are positively correlated to the probability of having an income from non farm activities.
Conversely, it is reasonable to suppose that they reduce the need of remittances, so we expect a negative correlation between them and outcome 3.

Farm size
In the literature, farm size is usually considered the fundamental asset in order to undertake an agricultural activity. In our context, this is a controversial indicator: private property rights on land are not common, so it would be misleading to consider the size of the household plot as a constraint for the farmers. The system of land distribution is based upon the decisions of the *tendanaa*. Households can ask to the *tendanaa* to use a larger amount of land (see section 3.7.1). The availability of land could be considered a real constraint only in the areas where there is scarcity of land, like in large parts of the Upper East Region. The field study showed that it is rather the soil infertility the major land issue.
Despite these limitations, the usual relationship between farm size and non agricultural activities found in the literature is negative: if a household can have access to a larger plot, it should have smaller probability to be engaged in non farm activities (cf. among the others Winters *et al.*, 2002 for Mexico; Elbers and Lanjouw, 2001 for Ecuador; Adams, 2002 for Egypt).
Moreover, we expect that a household with a smaller plot needs to receive remittances to integrate its income and it is more inclined to send one of its member out of the village. The lack of land resources are documented as determining migration in Salemink (2002), Rwelemira *et al.* (2002), Schrinder and Kneer (2000) and Rogaly and Rafique (2003).

◊ Crop productivity[29]
The dynamics of productivity of different crops are related with income diversification and different crops can have different impacts on it. Indeed, we do not expect the same behavior by staple crops, i.e. the ones used by the households mainly for their subsistence (like maize, millet and sorghum), vis-à-vis the crops that are directly sold or that can be processed and used for non farm activities (like rice or groundnuts or cassava[30]). We argue that the decrease of productivity of staple crops is associated with an increase of non agricultural activities. The hypothesis behind this is quite straightforward: if farming is not sufficient to fulfill basic food needs – e.g. due to soil infertility - households look for other income sources. Vice versa, the trend of non farm activities based on the processing of some crops is consistent with the productivity of these crops. For example, an increase of cassava harvest would allow women to process part of it in order to produce gari and to sell it in the market[31].
For these reason, we decided to use the data on millet – as a proxy for staple crops - and groundnuts – as a proxy for crops that can be used in non farm activities (e.g. processing). We used the district level data to compute a productivity index for both of them in 1999 as well as the ratio between productivity in 1999 and in 1992[32].

[29] Land productivity has been introduced among the determinants of non farm employment by Escobal (2001) for Peruvian case.
[30] "After drying and roasting the groundnut it can be used to make flour, soup, porridge, and milk. Groundnuts are often grown by small farm holders and is considered a woman's crop in Western Africa. Roasted peanuts is eaten as a snack in combination with banana; the kernels are pressed for the extraction of vegetable oil. This activity is a major source of income for women. Peanuts hay is an important livestock fee" (Kenny and Finn, 2004).
[31] The case of cotton (or of tomato and other vegetables, like pepper, garden eggs or okra) is peculiar, because they can only be directly sold. Therefore, they are cash crops that cannot be used as raw material to develop non farm activities.
[32] We computed, for each district of the sample, the productivity index as follows: we divided the value of the quantity produced of each crop by the hectares of land cultivated. We used the data relative to the current, the previous and the following year, in order to prevent any problem of production fluctuation.

We expect that millet productivity increase should strengthen the traditional structure of income, mainly based on subsistence farming, while it should be negatively correlated with other sources of income. Conversely, groundnut productivity should have a positive impact on the probability of being involved in non farm activities and a negative impact on remittances, that are assumed to be less necessary to the household's subsistence.

◊ Community assets

In the literature it is quite usual to consider the access to public assets as important determinants of income choice[33]. But, often, micro-level data do not contain information on community assets[34]. Access to infrastructures or services – such as markets, schools, health care, public transports, etc. - play a crucial role in enabling activities other than farming. Moreover, the use of community variables is very handy because they do not suffer from the problem of endogenity.

Among the many available community variables, we chose the ones we consider particularly relevant, namely: the existence of a market, the presence of an hospital within an hour walking distance, and regular visits of extension officers.

Market

The presence of a periodical or daily market[35] indicates a place where people meet to exchange goods and, therefore, should be positively correlated to non farm activities, even if the market is mainly for farm produce. Access to the market may have a negative impact on the probability of receiving remittances, since it should be easier for the households to sell part of their harvest and – as a consequence – remittances are less necessary. The distance from market is used as a determinant of non farm income by Escobal (2001) and Jonasson (2005).

Hospital

Proximity of an hospital is an indicator of a better quality of life and, considering that an hospital is an attractor of people, it can in principle facilitate the development of non farm activities. The health status is an important determinant of the working ability of the individual. In the literature Smith *et al.* (2001) pointed out the importance of access to health facilities for the ability to earn from non farm activities. There is little evidence on the impact of health on the probability to migrate, although Kothari (2002) observes that illness can exclude the opportunity to migrate.

Rural extension

Regular visits of extension officers should in principle improve farming, other things being equal, making it be more profitable. As a result income generating activities other than agriculture would be less likely.

5.6. Modelling income diversification

In this section we present the results of the multinomial model estimation. In a multinomial logit model one outcome must be chosen as the 'base outcome' (see section 5.2.2): we assigned this role to outcome 1 (i.e. only agricultural income); consequently, the estimate of other outcomes must be interpreted in comparison to a household who have only agricultural income.

We computed both the odds ratios and the marginal effects[36]. The meaning of these two estimates are different. The odd ratio is the ratio between two probabilities, namely the probability of being in group x on the probability of being in the reference group: here we are mostly interested in the sign of the coefficients, which show the direction of the relationship, and in the significance level of the z-test. The marginal effects indicate the change in the probability of being in group x as a consequence of a unit change of a given regressor, all other things being equal.

[33] The positive link between infrastructure access and non farm activities is proven in a number of studies, including Winters *et al.* (2002) for Mexico, de Janvry *et al.* (2005) for China, Berdeguè *et al.* (2001) for Chile, and Corral and Reardon (2001) for Nicaragua.

[34] Even in the Ghanaian survey, community data can be matched to the households' data only for selected areas; luckily enough this can be done for the Northern regions.

[35] Which is highly correlated to the presence of a junior secondary school and the availability of public transports.

[36] The marginal effects have been computed on the characteristics of the representative household, at the median value of continuous variables and at the mode for dummy and discrete variables. Marginal effect for a dichotomous variable is the change in the theoretical probability for a shift in the variable from 0 to 1.

We estimated several models according to different specifications[37], namely:

1) the first specification includes as explanatory variables only household characteristics: working age members, dependency ratio, age of the household's head, the highest education level among household members, farm size, ownership of livestock and equipment, percentage of home production on expenses and poverty status[38];
2) the second add to the previous variables also the community variables: market, hospital and extension officers;
3) the last one includes also millet and groundnuts productivity variables[39].

For all specifications of the model we tested the IIA hypothesis through the Hausman test, and the results are supportive of the assumption about the independence of irrelevant alternatives.
To control the goodness of fit of the model we report the percentage of correct predictions, and the maximum likelihood R^2[40].

5.6.1. Income from farm and non-farm activities

Outcome 2 is the one that the model is better able to explain. The majority of our hypotheses are confirmed. It means that the differences between this outcome and the base one – i.e. including only farm activities – are strong and are well caught by the model.
Non farm activities confirm to be more probable to be undertaken when the number of working age members is high; this relation is significant across the three specifications. The same is for the dependency ratio, which is economically[41] significant especially in the first specification, where the community variables are not included. Also the age of the household head has the expected negative impact on the probability to have an income from non farm activities.
The role of education in explaining the determinants of non farm activities is very important, and the result is robust across all specifications. Its impact on the probability to receive an income from non farm activities is also very significant from an economic point of view. As hypothesized, primary education is particularly explicative, as well as tertiary education. Education is less significant in the specifications including community variables.
The impact of the farm size on the probability to have an income from non farm activities shows the expected sign, and its effect is quite robust across specifications.
Assets like agricultural equipments and livestock show the expected signs on the probability to diversify in non farm activities, but unexpectedly they are not significant.
The percentage of home production on the household's expenses has the expected negative sign in all specifications except the first one, but it is not statistically significant.
Non poor households are more likely to undertake non farm activities. It is interesting that this effect is stronger for the variable 'poverty status 2' (cf. the two marginal effects), that is for households above the upper poverty line.

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[37] We tried to include a geographical dummy in order to take into account of any systematic difference between various locations not captured by the model specification. But, both the regions and the clusters we constructed in section 4.2.2, reveal to be not statistically significant as determinants of income diversification.
[38] We computed the three specifications of the model without the variable 'poverty status' and we obtained similar results. The estimates are available upon request from the author.
[39] We include the variables on crop productivity in only one specification because they could suffer from the problems of data reliability (see section 5.6)
[40] The maximum likelihood R^2 expresses the fit of the model as a transformation of likelihood ratio χ^2 in an analogous way to that of R^2 in a OLS regression, which can be though of as a transformation of the *F*-test statistic (Ender, 2003). Specifically:

$$R^2_{ML} = 1 - e^{-G^2/N} \text{ where } G^2 = -2\sum_i \sum_j n_{ij} \ln\left(\frac{n^*_{ij}}{n_{ij}}\right)$$

[41] Loosely speaking, an effect is deemed as 'economically significant' when its size is such to produce a non trivial impact on the phenomenon of interest; a coefficient can be statistically different from zero, but nevertheless negligible as it exerts only a minor influence (for a formal discussion of the distinction between economic and statistical significance, see McCloskey and Zilick, 1996).

Table 5.7. Determinants of income from farm and non farm activities (Outcome 2)

	Specification 1		Specification 2		Specification 3	
Variables	Coefficient (z test)	Marginal Effects (z test)	Coefficient (z test)	Marginal Effects (z test)	Coefficient (z test)	Marginal Effects (z test)
Working age Members	0.227 (2.04)**	0.076 (4.22)***	0.344 (2.21)**	0.020 (2.07)**	0.323 (2.16)**	0.022 (1.90)*
Dependency Ratio	2.49 (4.11)***	0.400 (4.05)***	2.464 (3.01)***	0.102 (1.94)*	2.33 (2.60)***	0.106 (1.72)*
Household Head age	-0.020 (-2.33)**	-0.003 (-2.31)**	-0.023 (-2.15)**	-0.000 (-1.44)	-0.023 (-2.44)**	-0.001 (-1.44)
Education 1	1.703 (3.49)***	0.189 (2.40)**	1.516 (3.68)***	0.058 (1.39)	1.517 (3.37)***	0.045 (1.00)
Education 2	1.112 (3.25)***	0.118 (1.83)*	1.168 (4.51)***	0.058 (2.13)**	0.960 (3.97)***	0.040 (1.73)*
Education 3	3.569 (4.39)***	0.387 (2.77)***	3.702 (2.92)***	0.361 (2.16)**	3.622 (3.10)***	0.321 (2.24)**
Farm size	-0.016 (-2.79)***	-0.001 (-1.10)	-0.014 (-2.66)***	-0.000 (-0.83)	-0.014 (-3.45)***	-0.000 (-0.51)
Equipment	0.267 (0.85)	0.003 (0.09)	0.156 (0.41)	0.002 (0.20)	0.039 (0.12)	-0.000 (-0.04)
Livestock	0.103 (0.39)	-0.229 (-0.56)	0.217 (0.55)	0.002 (0.18)	0.363 (0.83)	0.009 (0.60)
Home Production	-0.523 (-0.82)	0.102 (1.05)	-1.363 (-1.34)	-0.019 (-0.49)	-1.278 (-1.18)	-0.027 (-0.54)
Poverty Status 1	1.238 (3.35)***	0.171 (2.34)**	1.270 (2.59)**	0.070 (1.62)	1.409 (2.80)***	0.091 (1.94)*
Poverty Status 2	1.746 (5.20)***	0.416 (6.74)***	2.000 (3.99)***	0.222 (2.40)**	1.958 (3.56)***	0.240 (2.53)**
Market	-	-	2.186 (4.25)***	0.174 (3.46)***	2.194 (4.29)***	0.204 (3.54)***
Hospital	-	-	2.631 (3.91)***	0.221 (2.48)**	2.348 (2.89)***	0.214 (1.85)*
Extension Officers	-	-	-1.838 (-4.13)***	-0.117 (-2.29)**	-1.557 (-2.94)***	-0.077 (-1.43)
Millet	-	-	-	-	-0.000 (-0.20)	-0.000 (-0.39)
Millet ratio	-	-	-	-	-1.854 (-2.33)**	-0.072 (-1.38)
Groundnut	-	-	-	-	0.000 (1.36)	0.000 (1.77)
Groundnut Ratio	-	-	-	-	1.012 (1.90)*	0.048 (1.50)
Constant	-1.552 (-2.58)**	-	-1.853 (-1.83)*	-	-1.847 (0.77)	-
Number of Observations	600		600		600	
Correct Prediction (percentage)	43.20		49.73		54.19	
Maximum Likelihood R^2	0.286		0.402		0.453	

Notes: all households have some agricultural incomes; ***, ** and * denote significance at the 1, 5 and 10 percent respectively; standard errors adjusted for clustering on the sample enumeration areas. The marginal effects are computed at the median values of continuous variables, and at the value of the modal class for dummy and discrete variables. Outcome 1 is the base outcome.

One of the most important result of this model is the robustness of the statistical and economic significance of the three community variables, that show the expected signs on the probability to

diversify (i.e. positive for market and hospital, negative for rural extension). It is remarkable the magnitude of their marginal effects, which are quite high, confirming our hypothesis on the importance of community variables in explaining the decision to diversify.
The variation of the productivity of millet and groundnuts between 1991 and 1998 have the expected signs and they are both significant.

5.6.2. Income from farm activities and remittances

Table 5.8 shows the estimates for outcome 3 across all specifications; they are not as good as the ones for outcome 2. Some of them are not statistically significant, but almost all show the expected signs.
Working age members is negative, as we expected, and statistically significant. The result is robust across the specifications, although it could be influenced by the absence of the migrant (see section 5.6 for the problem of endogenity). The dependency ratio, despite having the expected sign, is not significant. And the same is for the age of the household head.
Primary education, farm size and the percentage of home production on household consumption are the variables that better explain remittances receipt.
Household assets are not significant either for the receipt of remittances, confirming the limitative rule of private assets in explaining the household livelihood strategies. Surprisingly, the sign of the relation is not the one we expected and in one of the specifications the variable 'livestock' is positively correlated to the probability to receive an income from remittances[42].
The marginal effect of the variable 'poverty status 2' is statistically and economically significant: it means that, even if the variable is not significant *on average* in the model, being above the upper poverty line negatively affects the probability of the representative household to receive remittances.
The fact that the odd ratios of the market variable are not significant indicates that there are not systematic differences in market access between the farmers households receiving or not receiving remittances. The variable 'hospital' is statistically significant only in the second specification. While, the variable 'extension officers' is the sole community variable well able to distinguish between the households receiving or not receiving remittances[43].
The lower explanatory power of the model could be due to the lack of specific data on migrants (cf. section 5.6): we do not know which characteristics featured the households before the migrant's departure.
Nevertheless, the model manages to explain the systematic differences between households who receive only farming income and the ones who receive also remittances. These two groups share similar household's characteristics, except for the ability to cover their expenses with home production, for the education level, for the farm size, and for the number of working age members. The visit of the extension officers permits to single out the two groups of households.
Moreover, an interesting result is the negative impact of the increase of groundnuts productivity on the probability of receiving remittances. This partially confirms our hypothesis on the impact of crop productivity on income diversification strategies.

[42] A possible explanation is the endogenity of the variable: households receiving remittances may use them to buy livestock as a form of savings, in order to reduce their vulnerability.
[43] If we compute the same model using outcome 4 as reference, we can make a direct comparison between farmers households having only remittances and the ones having also an income from non-farm activities. In this case, the presence of a market or of an hospital decreases the probability of receiving only remittances. Moreover, the households with higher education level (secondary and tertiary) and with an higher poverty status have a lower probability to receive only remittances.

Table 5.8. Determinants of income from farming and from remittances (Outcome 3)

	Specification 1		Specification 2		Specification 3	
Variables	Coefficient (z test)	Marginal Effects (z test)	Coefficient (z test)	Marginal Effects (z test)	Coefficient (z test)	Marginal Effects (z test)
Working age members	-0.530 (-2.58)**	-0.104 (-2.42)**	-0.538 (-1.90)*	-0.109 (-1.79)*	-0.535 (-1.73)*	-0.107 (-1.59)
Dependency ratio	-0.374 (-0.49)	-0.247 (-1.77)*	-0.387 (-0.53)	-0.115 (-0.75)	-0.095 (-0.13)	-0.058 (-0.39)
Household Head age	0.000 (0.07)	0.001 (0.68)	-0.001 (-0.10)	0.000 (0.03)	0.002 (0.26)	0.000 (0.41)
Education 1	1.147 (2.49)**	0.030 (0.38)	1.239 (2.98)***	0.223 (2.19)**	1.640 (3.59)***	0.302 (2.78)***
Education 2	0.217 (0.45)	-0.097 (-1.41)	0.353 (0.94)	0.017 (0.20)	0.565 (1.54)	0.064 (0.68)
Education 3	1.019 (0.78)	-0.213 (-2.75)***	0.916 (0.63)	-0.112 (-0.82)	1.294 (0.90)	-0.068 (-0.44)
Farm size	-0.017 (-1.68)*	-0.001 (-0.93)	-0.027 (-2.69)***	-0.005 (-2.24)**	-0.039 (-3.52)***	-0.077 (-2.91)***
Equipment	0.273 (0.71)	0.006 (0.10)	0.233 (0.63)	0.041 (0.54)	0.125 (0.34)	0.021 (0.29)
Livestock	0.550 (1.62)	0.079 (1.47)	0.554 (1.66)*	0.091 (1.66)*	0.430 (1.40)	0.068 (1.38)
Home production	-2.273 (-2.57)**	-0.344 (-1.97)**	-2.594 (-2.59)**	-0.470 (-2.60)***	-1.968 (-2.02)**	-0.340 (-1.84)*
Poverty Status 1	0.289 (0.65)	-0.079 (-1.18)	0.404 (0.78)	0.034 (0.34)	0.485 (0.87)	0.041 (0.38)
Poverty Status 2	-0.703 (-1.40)	-0.203 (-4.35)***	-0.592 (-1.30)	-0.146 (-2.01)**	-0.688 (-1.38)	-0.156 (-2.04)**
Market	-	-	0.451 (1.03)	-0.025 (-0.36)	0.323 (0.67)	-0.052 (-0.67)
Hospital	-	-	0.646 (1.66)*	-0.038 (-0.44)	0.306 (0.80)	-0.079 (-0.89)
Extension Officers	-	-	-0.826 (-2.25)**	-0.104 (-1.20)	-0.143 (-2.72)***	-0.195 (-1.95)*
Millet	-	-	-	-	0.000 (1.17)	0.000 (1.27)
Millet ratio	-	-	-	-	-0.830 (-1.60)	-0.131 (-1.19)
Groundnut	-	-	-	-	-0.000 (-2.73)***	-0.000 (-2.45)**
Groundnut Ratio	-	-	-	-	-0.281 (-0.69)	-0.079 (-1.03)
Constant	0.894 (1.10)	-	1.438 (1.44)	-	4.091 (2.24)*	-
Number of Observations	600		600		600	
Correct Prediction (percentage)	43.20		49.73		54.19	
Maximum Likelihood R^2	0.286		0.402		0.453	

Notes: all households have some agricultural incomes; ***, ** and * denote significance at the 1, 5 and 10 percent respectively; standard errors adjusted for clustering on the sample enumeration areas. The marginal effects are computed at the median values of continuous variables, and at the value of the modal class for dummy and discrete variables. Outcome 1 is the base outcome.

5.6.3. Income from farm, non-farm activities and remittances

The number of working age members negatively affects the probability to diversify through both remittances and non-farm income[44], although this result is not consistent over the three specifications.

Table 5.9. Determinants of income from farming, non agricultural activities and remittances (Outcome 4)

	Specification 1		Specification 2		Specification 3	
Variables	Coefficient (z test)	Marginal Effects (z test)	Coefficient (z test)	Marginal Effects (z test)	Coefficient (z test)	Marginal Effects (z test)
Working Age members	-0.146 (-2.98)***	-0.032 (-1.80)*	-0.283 (-1.61)	-0.004 (-0.92)	-0.296 (-1.84)*	-0.005 (-1.22)
Dependency Ratio	0.946 (1.21)	0.052 (0.68)	0.994 (1.04)	0.032 (0.98)	0.903 (0.92)	0.030 (0.78)
Household Head age	-0.001 (-0.11)	0.000 (0.31)	-0.004 (-0.30)	-0.000 (-0.20)	-0.000 (-0.04)	-0.000 (0.02)
Education 1	1.312 (2.46)**	0.037 (0.65)	1.235 (2.93)***	0.026 (1.19)	1.303 (2.94)***	0.021 (0.92)
Education 2	1.520 (3.68)***	0.169 (2.41)**	1.579 (3.36)***	0.087 (1.44)	1.519 (3.00)***	0.084 (1.25)
Education 3	3.438 (3.73)***	0.191 (1.44)	3.567 (2.53)**	0.246 (1.47)	3.627 (2.70)***	0.257 (1.40)
Farm size	-0.017 (-1.16)	-0.000 (-0.54)	-0.011 (-1.15)	-0.000 (-0.24)	-0.013 (-1.52)	-0.000 (-0.18)
Equipment	0.736 (1.84)*	0.076 (1.39)	0.468 (1.03)	0.015 (0.87)	0.301 (0.75)	0.010 (0.66)
Livestock	0.562 (1.52)	0.036 (1.17)	1.606 (1.22)	0.012 (0.99)	0.717 (1.32)	0.016 (1.24)
Home Production	-2.403 (-2.35)**	-0.168 (-1.50)	-3.473 (-2.71)***	-0.086 (-2.28)**	-3.103 (-2.54)**	-0.091 (-1.91)*
Poverty Status 1	1.188 (2.62)***	0.092 (1.44)	1.259 (2.72)***	0.055 (1.64)	1.224 (2.49)**	0.054 (1.30)
Poverty Status 2	0.386 (0.80)	-0.026 (-0.66)	0.643 (1.16)	0.020 (0.91)	0.475 (0.82)	0.013 (0.62)
Market	-	-	2.100 (4.41)***	0.124 (2.77)***	1.911 (4.23)***	0.113 (2.75)***
Hospital	-	-	2.621 (5.79)***	0.173 (3.35)***	2.363 (4.64)***	0.173 (2.91)***
Extension Officers	-	-	-1.213 (-2.70)***	-0.034 (-1.66)*	-0.972 (-2.55)**	-0.017 (-1.25)
Millet	-	-	-	-	-0.000 (-0.70)	-0.000 (-1.02)
Millet ratio	-	-	-	-	-0.812 (-1.75)*	-0.017 (-0.97)
Groundnut	-	-	-	-	-0.000 (-0.02)	0.000 (0.84)
Groundnut Ratio	-	-	-	-	0.981 (2.00)**	0.037 (1.72)*
Constant	-0.719 (-0.80)	-	-1.324 (-0.95)	-	-0.621 (0.28)	-
Number of Observations	600		600		600	
Correct Prediction (percentage)	43.20		49.73		54.19	
Maximum Likelihood R^2	0.286		0.402		0.453	

Notes: all households have some agricultural incomes; ***, ** and * denote significance at the 1, 5 and 10 percent respectively; standard errors adjusted for clustering on the sample enumeration areas. The marginal effects are computed at the median values of continuous variables, and at the value of the modal class for dummy and discrete variables. Outcome 1 is the base outcome.

[44] Here, a similar problem of endogenity, as for the previous outcome, could exist.

The dependency ratio and the age of household head are not significant, while the educational status variables show to be extremely important as determinants of this kind of income. In particular, it is notable the role of tertiary education.
Agricultural equipment ownership is significant only when we do not include the community variables into the model, while ownership of livestock and farm size are not significant.
Vice versa the access to community assets is a strong determinant of outcome 4, being statistically highly significant across all specifications, showing the expected signs, and having important marginal effects.
As we expected, an increase of the percentage of the share of home production in household consumption determines a decrease of the probability of having outcome 4.
Another result consistent with expectations is that being above the extreme poverty line increases the probability of a household to diversify in both non farm activities and migration.
Considering the variables measuring crops production, the ratios of millet and groundnuts productivity in 1998 compared to the productivity of 1993 are significant and they show the expected signs.

5.6.4. Cross-cutting remarks

In conclusion, we can characterize each group of households according to its typical traits:

1. Davis *et al*. (2007), in their research on rural income generating activities across the developing world, state: "households participating in on farm activities own land, have lower levels of education, are located at a distance from infrastructure facilities and have on average an older, male headed household" (p.33). Our results are consistent with their conclusions, except for the sex of the household head. Moreover, we can add that farming-only households are generally the ones who have a better staple crops production and that they are among the poorest of the region.
2. A household receiving remittances is very similar to the previous one, but it shows a lower share of self-consumption, a smaller farm size, a smaller number of working age members, a better level of education and less frequent extension visits. Moreover, the higher the cash crop productivity (e.g. groundnuts), the lower the probability of sending out a household member (i.e. to receive remittances).
3. Generally a household which diversifies in non-farm activities operates a smaller plot as compared to a farm-income-only household, has an higher number of working age members and an higher dependency ratio, has a younger household's head, a higher level of education, is located close to community facilities, and is less often visited by an extension officer. Generally it has good yield in crops that are used for non-farm activities (i.e. food processing) and is among the better off.
4. The households who diversify in all three activities are similar to the ones who have farm and non-farm incomes, but show, on average, a smaller number of household members and a smaller dependency ratio, lower home production on consumption and, more important, they are poorer. Compared to the households receiving only remittances, they have a better level of education, a better access to community facilities, except for extension services, and they are wealthier.

In order to better understand how each independent variable influences households livelihood strategies, we now compute the probabilities to chose each outcome by the representative household[45]. We suppose a unit change of each regressor and we estimate how much would be ceteris paribus the implied change in the probability of choosing each outcome by the representative household. In doing this, we adopt the second specification, that is the one not featuring data problems (i.e. crop production data) and including the community variables.

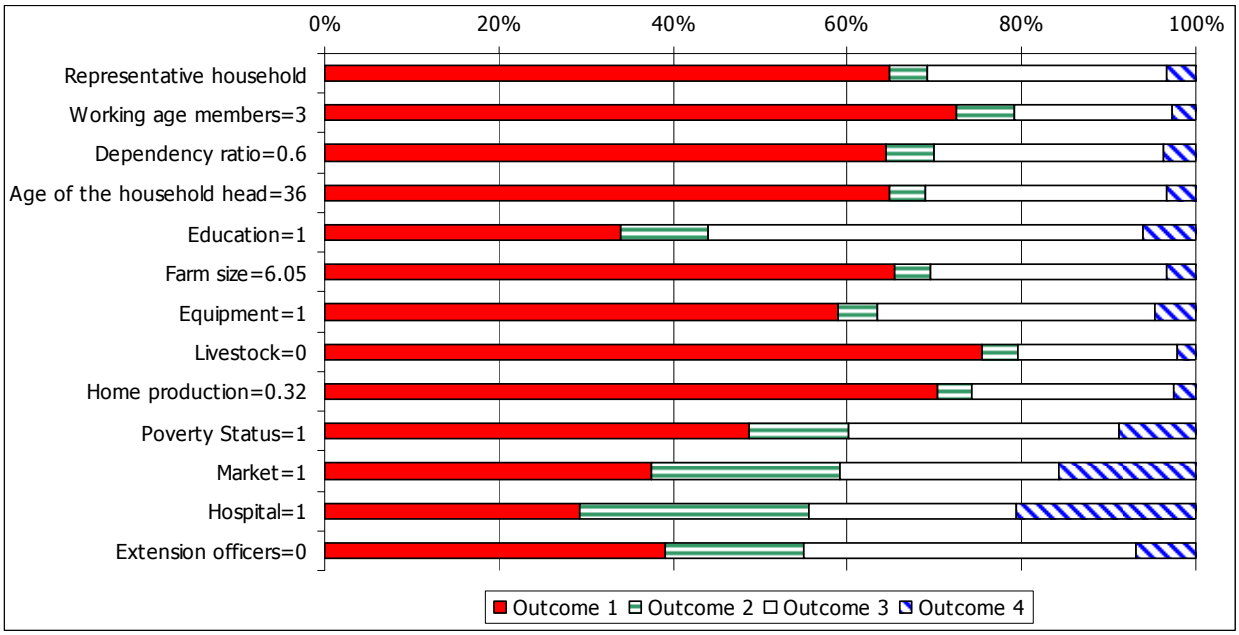
[45] The representative household is a household of 2 working age members, with a dependency ratio of 0.5, where the household head is 35 years old and none of the members is educated. It operates 5.05 hectares of land with no agricultural equipment, but it owns livestock, and its home production covers 23 percent of its consumption. The representative household has an income under the extreme poverty line. In the community where it lives there is neither a market nor an hospital within an hour walking distance, but farmers are periodically visited by an extension officer.

Table 5.10. Probabilities associated to each outcome for the representative household and marginal probabilities changes of each independent variable. Percentages.

	Probabilities Outcome 1	Probabilities Outcome 2	Probabilities Outcome 3	Probabilities Outcome 4
Representative household	64.8	4.2	27.5	3.3
Working age members=3	72.5	6.6	18.0	2.8
Dependency ratio=0.6	64.5	5.3	26.4	3.6
Age of the household head=36	64.9	4.1	27.6	3.3
Education=1	33.9	10.0	49.9	6.0
Farm size=6.05	65.4	4.2	27.0	3.3
Equipment=1	58.9	4.5	31.7	4.8
Livestock=0	75.5	3.9	18.4	2.1
Home production=0.32	70.4	3.9	23.0	2.6
Poverty Status=1	48.8	11.3	31.0	8.9
Market=1	37.5	21.6	25.0	15.8
Hospital=1	29.2	26.3	23.7	20.7
Extension officers=0	39.2	15.9	39.1	6.8

Table 5.10 reports the results of such analysis. For example, the representative household[46] has a 64.8 percent chance of having only an agricultural income; for a household with the same characteristics except for the level of education – that is now elementary – this chance decreases to only 33.9 percent, while the probabilities to undertake a non-farm activity (outcome 2 or 4) or to receive remittances clearly increase.

Figure 5.7. Probabilities associated to each outcome for the representative household and probabilities associated to an unit change of each independent variable.



[46] According to the results of the model, the representative household's characteristics are typical of a household who does not receive any income from non farm activities. In fact, the probability to have outcome 1 and outcome 3 is very high in comparison to the percentages of sample households who effectively undertake these livelihood strategies (respectively 31.2 and 15.86 percent). If we compute the marginal effects for an household showing the characteristics we impute to an household receiving an income from non farm activities – i.e. an higher education level (elementary), a better poverty status (above the extreme, but under the upper poverty line), the presence of a market and an hospital in the community and the absence of an extension officer -, we found that our model assigns a 76.46 percent to the probability to have outcome 2 and a 22 percent to the probability of have outcome 4.

Figure 5.7 graphically shows the same results of Table 5.10, the marginal probabilities changes of choosing a given livelihood strategy as a consequence of a unit change of a given regressor: it is clear that education, poverty status and community variables imply larger changes.

5.7. Determinants of diversification over time

The purpose of this section is to analyze the determinants of income diversification from the sample obtained through the pooling of GLSS3 and GLSS4 data; such an estimation can be performed provided that the relationship between income diversification and its underlying household- and community-level determinants did not experience structural changes between 1991 and 1998. Therefore, we need first to formally test the plausibility of this necessary hypothesis[47].

We rely on the second specification, and we interact all variables with the dichotomous variable *t* describing the round of the GLSS the observation belongs to; the absence of structural breaks in the relationship of interest would entail that the *z*- statistic for the interacted variables should not be significantly different from zero[48]. Only 7 out of 42 coefficients of the interacted variables are statistically significant, and most of them just marginally so,[49] and interestingly 3 of these coefficients refer to the impact of community-level variables on the probability to earn an income from non farm activities[50].

Thus, the *z*- statistic provided supportive evidence to the broad stability of the relationships of interest, so that table 5.11 reports the estimates on the pooled sample without interaction terms, that do not evidence major changes in the sign and significance of the estimated effects on the GLSS4 sample alone[51]. A first interesting finding is that the results of the model are stable over time.

The dichotomous variable capturing time is not a significant determinant of the probability to receive an income from non farm activities, despite the unquestionable decline over time in the share of households adopting strategy 2. This means that the changes over time in the other covariates succeed in explaining the observed change in the incidence of this strategy. This variable is not significant also with respect to outcome 4.

Conversely, the impact of time in explaining remittances is important, signaling the sharp increase of the number of recipient households. The time variable thus captures all the changes occurred over time that are not already captured by changes in the other explanatory variables, suggesting that there are unobserved factors that – in 1998 - induced much more households to resort to migration as a livelihood strategy.

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[47] In order to include variables drawn from the community questionnaire in the estimation, we had to drop 50 households from the GLSS3 sample, as no community questionnaire was administered in their communities.

[48] We are aware that in non linear models the magnitude of the interaction effect needs not to coincide with the marginal effect of the interaction term, can be of opposite sign, and its statistical significance is not calculated by standard software (Ai and Norton, 2003). There is no Stata command that extends the command *inteff* by Norton *et al.* (2004) which computes the interaction effect for logit and probit models to multinomial logit models.

[49] The estimates are available upon request from the author.

[50] Specifically, the presence of a periodical market in the community produces a larger effect upon the estimated probability that a household draws income from non farm activities, i.e. either outcome 2 or 4, from the households pertaining to the GLSS4 sample; these estimates can be traced back to what the field survey evidenced with respect to how non farm activities have been changing over time. In particular, chapter 4 reported that some non farm activities – and food processing in particular – that used to serve self-consumption needs became more market-oriented over time, and thus more responsive to the presence of a periodical market in the community. Conversely, the lamented worsening in the quality of extension services, mostly due to the lack of adequate fiscal resources, does not appear to be borne out in the data, as the visits by extension officers in 1998 appear to have a larger impact on the estimated probability that a household draws its income exclusively from agriculture.

[51] The major changes are registered for the fourth outcome: all are in line with our previsions. The dependency ratio is positively related to an increase in the probability of having outcome 4, and the same is for the livestock ownership and for the 'poverty status 2'. Conversely, the number of working age members is no more significant.

Table 5.11. Determinants of income diversification, computed using data from GLSS3 and GLSS4

Outcome	Agricultural and non. agric. Incomes		Agricultural and remittances incomes		Agricultural, remittance and non agric. incomes	
Variable	Coefficient (z-test)	Marginal effect (z-test)	Coefficient (z-test)	Marginal effect (z-test)	Coefficient (z-test)	Marginal effect (z-test)
Working age members	0.160 (1.94)*	0.031 (2.75)***	-0.474 (-2.72)***	-0.100 (-2.61)***	-0.137 (-1.31)	-0.000 (-0.08)
Dependency ratio	1.683 (3.57)***	0.152 (2.99)***	0.066 (0.13)	-0.066 (-0.61)	1.381 (2.64)***	0.069 (2.22)**
Household haed age	-0.006 (-0.88)	-0.000 (-1.20)	0.003 (0.49)	0.000 (0.58)	0.004 (0.59)	0.000 (0.54)
Education(1)	1.696 (5.38)***	0.134 (2.10)**	1.279 (3.55)***	0.137 (1.53)	1.412 (3.87)**	0.043 (1.37)
Education(2)	1.046 (5.20)***	0.099 (2.68)***	0.336 (0.95)	-0.017 (-0.23)	1.306 (3.85)***	0.093 (1.87)*
Education(3)	1.625 (2.71)***	0.176 (1.71)*	0.584 (0.73)	-0.022 (0.16)	1.638 (2.55)**	0.104 (1.63)
Farm size	-0.008 (-1.97)**	-0.000 (-0.15)	-0.021 (-2.50)**	-0.003 (-1.96)*	-0.010 (-0.94)	-0.000 (-0.21)
Equipment	0.295 (0.95)	0.010 (0.40)	0.404 (1.32)	0.065 (1.03)	0.490 (1.42)	0.021 (0.95)
Livestock	0.267 (1.06)	0.008 (0.35)	0.496 (1.84)*	0.077 (1.58)	0.709 (2.04)**	0.025 (1.61)
Home production	-0.687 (-0.91)	0.009 (0.13)	-2.00 (-2.58)**	-0.362 (-2.29)**	-1.712 (-2.10)	-0.059 (-1.44)
Poverty Status (1)	0.661 (2.22)**	0.072 (1.98)**	-0.046 (-0.12)	-0.053 (-0.76)	0.782 (2.31)**	0.055 (1.63)
Poverty Status (2)	1.113 (3.59)***	0.162 (2.94)***	-0.244 (-0.82)	-0.106 (-1.85)*	0.719 (2.34)**	0.042 (1.85)*
Market	1.109 (2.90)***	0.144 (3.34)***	-0.086 (-0.27)	-0.087 (-1.77)*	0.989 (2.46)**	0.067 (2.12)**
Hospital	1.716 (3.45)***	0.191 (2.41)**	0.486 (1.47)	-0.057 (-0.71)	1.847 (4.05)***	0.135 (2.80)***
Extension Officers	-0.901 (-2.32)**	-0.086 (-2.03)**	-0.424 (-1.26)	-0.032 (-0.47)	-0.686 (-1.70)*	-0.028 (-1.13)
Time	-0.316 (-0.95)	-0.056 (-1.37)	0.729 (2.39)**	0.137 (2.60)***	-0.222 (-0.57)	-0.024 (-0.90)
Constant	-1.381 (-2.09)**	-	-0.147 (-0.24)	-	-2.150 (-2.50)**	-
Observations	1,069					
Perc. of correct predictions	51.40					
Wald χ^2 (36)	583.13					
Prob χ^2	0.000					
Maximum Likelihood R^2	0.268					

Notes: all households have some agricultural incomes; ***, ** and * denote significance at the 1, 5 and 10 percent respectively; standard errors adjusted for clustering on the sample enumeration areas. The marginal effects are computed at the median values of continuous variables, and at the value of the modal class for dummy and discrete variables. Outcome 1 is the base outcome.

5.8. Conclusions

Our analysis of income diversification in the rural areas of Northern Ghana, which is indeed the first study on non farm activities and remittances using the GLSS data in this area, drew on a well-established body of literature on this topic, but it also introduced some methodological innovations, that play a non-negligible role in the main results of the analysis.

The focus on the sole Northern Ghana is explained with the peculiar features of the areas - as we evidenced in section 3.6 – which deserves a specific and separate analysis.
We used micro data from a household survey as well as data from a community questionnaire, that allow a better understanding of the role of public assets in explaining household choices. One of the reasons why it is crucial to include community-level variables in the analysis is that income inequality among communities in Northern Ghana is wider than inequality within the communities. And, as we saw in section 5.3.2, belonging to a community contributes to explain the differences in poverty levels across sample households. This suggests that there is a certain degree of homogeneity in the welfare level of people living in the same area.
We used two datasets (i.e. the third and the fourth round of the GLSS) in order to observe how things have changed between 1991 and 1998.
The increasing significance of remittances among income sources in Ghana, and particularly in Northern Ghana, led us to introduce another methodological innovation. In fact – differently from the majority of studies on income diversification - we explicitly regarded the receipt of remittances as a livelihood strategy that households can resort to. This has close similarities with the analysis of participation in off-farm activities in Mexico by de Janvry and Saudolet (2001)[52].
At the beginning of this work we wondered – as one of the main research questions of the dissertation – which were the determinants of income diversification in Northern Ghana. The findings of the empirical analysis permit to give some tentative answers.
Among the household characteristics, education level is the variable that better permits to distinguish among the different livelihood strategies a household can undertake: primary education is particularly important among the determinants of remittances receipt, while higher education levels are typical of households with an income from non farm activities.
The composition of the household is another important determinant of income diversification: the higher are the number of working age members and the dependency ratio, the higher are the incentives and the opportunities to diversify in non farm activities.
We evidenced –and this is new in the literature – the role of self consumption as a push factor of diversification. With an high percentage of consumption of home produced food, there is not an urgent need to receive incomes other than agricultural ones to supplement the household's basic needs. And, at the same time, there are a few available resources to undertake non agricultural activities.
Household's assets showed a lower importance than we expected: only the farm size seems to be an important determinant of income diversification. Conversely, we found that access to community assets (i.e. markets and hospitals) is more important than the household-level characteristics. Moreover, the role of farmer support schemes is generally overlooked.
We also stressed the role of crop productivity, suggesting that cash crops and staple crops productivity have a different impact on household's livelihood strategies[53]. In particular, a drop in the productivity of a staple crop is positively associated to the non agricultural income sources, while a fall in the productivity of those cash crops that can be processed decreases the probability of undertaking non farm activities, and it increases the probability of receiving remittances.
The successful inclusion of this kind of variables (i.e. community assets and crop productivity) in an empirical model studying income diversification proves that it is necessary to adopt a wider perspective, moving beyond either an individual- or a household-level perspective, in order to understand the dynamics of household livelihood strategies.
In the last part of the chapter, we showed that the relationships evidenced in the model have not changed a lot between 1991 and 1998. The increasing importance across the 1990s of the presence of a market as a determinant of income diversification is explained with the fact that the households became more market oriented.

[52] The authors included seasonal migration to the US in the set of activities that Mexican households can choose
[53] We are aware of the fact that this result needs to be well considered, since the source of the data has not the same reliability of GLSS data. Nevertheless, we argue that our attempt to include in the model a similar measure of two different kinds of crops points to the opportunity of a stronger effort to link the determinants of income diversification to the production trend of the main crops of the study area.

However, household and community characteristics alone are not able to explain the recorded increase in the number of remittances-recipient households, that has to be ascribed to the unobserved economic, political and environmental changes occurred during the 1990s, that we were unable to account for in the model.

Among our findings, the relationships we were able to identify between poverty, inequality and income diversification are particularly noteworthy. Our results confirm the hypothesis – common in the literature – of a positive relationship between income and diversification into non farm activities: in order to undertake these activities it is necessary to be able to overcome their entry barriers. Moreover, most non farm activities are strictly related to the farm produce, so that the poorest households – which even lack enough agricultural products to feed their families – are not able to undertake this pathway out of poverty.

For the poorest households it is easier to earn an income from remittances: in Northern Ghana context the household members are so many that the seasonal migration of one of them does not jeopardize the yield of the farm, and it could actually represent a crucial source of income for the other members. In fact, we found that remittances recipient households are among the poorest of the sample: remittances serve as a social security mechanism for them, in order to reduce their vulnerability.

At the same time, our results are also consistent with a negative impact of non farm activities on inequality, an idea that has already been advanced in part of the literature (see section 2.5). Thus, we suppose that better off rural households are able to improve their welfare level through a major involvement in these kind of activities and this led a deepening income inequality in the society. However, the contribution of non farm self employed income to overall income inequality decreased between 1991 and 1998, suggesting that non farm activities are becoming more accessible.

On the contrary, GLSS4 data show that remittances – being received by the poorest – contribute to reduce income inequality, while in 1991 their contribution to inequality was slightly positive. This finding, together to the sharp increase of the contribution of remittances to total income over the 1990s, strengthen the hypothesis that migration is used as a coping strategy rather than as a accumulative strategy, and that it is unlikely to improve the household socioeconomic status in the long run.

As we showed throughout the chapter, migration and diversification in non agricultural activities are two strategies adopted by households who have different characteristics, so that we can not regard them as alternative strategies, and one should not put them in a single category of 'off farm diversification'. These strategies, responding to different needs, sometimes are complementary, generally for the households with an 'intermediate' welfare level.

6. Conclusions

In 2007, during the celebrations for the 50th anniversary of the independence from the United Kingdom, many observers praised Ghana for being one of the most successful stories of the application of structural adjustment policies, arguing that within a short time period it would have eventually joined the club of middle-income countries. Admittedly, the economic policies implemented since 1983 rescued a country that was suffering since too long for a deep economic crisis; tight fiscal policies successfully reined in the budget deficit, and large amount of aid inflows provided the resources for some critical public investments. Still, the economic growth that Ghana recorded since then has been unevenly distributed across sectors and regions. Only a limited number of areas of the country – specifically urban areas and the so called *middle belt* with its cocoa plantations – benefited to a significant extent from the growth process.
The uneven growth of the country induced us to focus our attention on Northern Ghana, that has historically been the poorest area of the country, with the aim to analyze the link between the macro and the micro levels, trying to understand how the macro changes occurred in the last two decades influenced the livelihood of the people living in the rural areas of Northern Ghana. In order to do so, we resorted to both qualitative and quantitative analytical tools, as an integrated approach can provide a significantly richer picture and it can overcome the inherent limitations of each one of the two methodologies. The findings drawn from a field study conducted in a sample of rural communities in the three northern regions of the country played a critical role in drafting some hypotheses that were then tested in the econometric analysis, and they helped to interpret its estimates. Conversely, the econometric analysis made it possible a quantitative assessment of the working hypotheses stemming out from the field study.
In this chapter we refer back to the research questions we laid out in chapter 1, in order to highlight how this dissertation has addressed them.

1) How have economic, institutional and environmental contexts been evolving over the last two decades in rural Northern Ghana?
The Northern area of the country remained at the margin of the Ghanaian process of growth, although even there urban areas, and most notably Tamale, managed to grow, with an expansion that was mainly concentrated in the service sector. No significant spillovers accrued to the rural areas, where the living sources and the main economic activities have been remaining virtually unchanged over the past decades.
The main positive changes that occurred in this area of the country over the past 20 years have had an external origin, as they can be traced back to the intervention of foreign donors and NGOs, that have been implementing a rich array of small-scale – and almost invariably uncoordinated - development projects. These ranged from boreholes digging, building of schools and clinics, to the up-grading of the road system. Some NGOs also supported the traditional non farm economic activities performed by women, through the provision of credit, technical support and the creation of cooperatives geared at a progressive market-orientation of these activities.
Sadly enough, the negative changes appear to have been prevailing in this area: these ranged from climatic changes – basically an increasingly erratic rainfall pattern - to the economic reforms that adversely hit some of the main agricultural activities of Northern Ghana, and to the slash to the allocation of public funds to some large scale development projects that had started, with promising results, back in the 1970s. The decentralization reform aimed at strengthening the local institutions only partially achieved its objective and did not manage to really democratize the decision process.

2) What is people's perception of these changes and what effects have these processes had on the livelihood strategies of rural households?
We gathered information about the perceptions of rural population on the changes in the economic, institutional and environmental contexts and about their implications for households livelihoods in the field study. The sample districts selection was based on a clustering of districts of Northern Ghana carried out by WFP (2004), that derived five homogeneous clusters with respect to population density, elevation and ground cover; we randomly drew one district from

each cluster, and we verified the hypothesis that WFP (2004) clusters share similarities in terms of the access to some key assets through a cluster analysis on district level data from the 2003 *Core Welfare Indicators Survey*. Then, we visited a set of communities, randomly drawn within each sampled district, representative of the variety of relevant asset portfolios of the study area. This stratified sample selection process aimed at identifying geographical areas that shared similarities in terms of some key variables that we expected to play a key role in shaping household livelihood strategies.

The focus group discussions in the communities stressed the decline in land fertility, due to an array of factors: soil erosion, increasingly erratic rainfalls, rising demographic pressure on land, insufficient use of chemical fertilizers due to the removal of public subsidies.

The decline in land yields induced a variety of responses, ranging from an intensification or extensification of land use, to the adoption of new crops and a greater reliance on market transactions to meet basic food consumption needs. Intensification of land use (i.e. increasing productivity per unit land area, for example reducing fallow period) is more common where the population density is high, while extensification (i.e. using more units of land for agriculture, also the remote ones) is widespread where population density is low and there is abundance of land.

Farmers repeatedly called for irrigation investments to reduce their dependence on rainfall, for the improvement of storage systems, for the support to the introduction of better farming techniques and for credit provision to help the recovery of the agricultural sector. The extension officers of the Ministry of Agriculture are unable to live up to the farmers' requests, as their role suffered from the reported reduction of public funds allocated to the agricultural sector. Nevertheless, most communities praised their job, as extension officers also provide highly appreciated veterinary services that are critical as livestock is the most important store of wealth in this area.

The decline in land yields determined a widespread increase in non farm activities, as farming activities alone became hardly sufficient to earn a living. Households engaged in new activities, as mining, tree cropping and the production of charcoal, while traditional activities as weaving and food processing became more market-oriented. The lack of access to credit and high transport costs in more remote areas hinder the development of non farm activities, that do not replace farming as the key household occupation, but rather supplement farming as a source of income. Another strategy that has been pursued to meet cash needs is migration, which is indeed a multifaceted phenomenon. Rural-to-rural seasonal migration is the most common - and still increasing - migration pattern, triggered by poverty. Other two, although less common, patterns of migration are temporary migration of young women, aiming at gathering resources for the dowry, and permanent migration of whole households.

The observed changes in livelihood strategies generally determined a negative impact on the environment, that was already characterized by a fragile equilibrium: farming practices are often inappropriate and contribute to soil erosion, mining induces substantial pollution, while charcoal production is depleting the wooden resources.

Nevertheless, the communities almost invariably reported an improvement in their well-being, due to a better access to improved water sources, healthcare services and schools. All the more so for women, as the changes in the livelihood strategies brought about a greater autonomy to them.

3) Has income diversification actually increased, and which factors have eventually driven its increase?

In the field study we found that income diversification has actually increased in the study area as a consequence of the progressive crisis of the agricultural sector and we found several response strategies adopted by the communities to face the new context. To better answer to the research question about the determinants of income diversification, we carried out an econometric analysis using the GLSS data, where the main unit of analysis is the household. This analysis represents, to the best of our knowledge, the first attempt to study non farm activities and remittances using these data in Northern Ghana. Moreover, our study is characterized by some methodological innovations. In fact, we combined household-level data with community-level information drawn from the companion community questionnaire that was

administered in rural areas[1]. This is extremely important, as income inequality among communities is wider than inequality within the communities, and therefore community-level variables are expected to have a significant explanatory power.
Another methodological innovation we introduced in the econometric analysis is considering migration – and its most apparent counterpart, the ensuing flow of remittances – as a distinct source of income, rather than ignoring it or grouping it under the broad label of non farm activities. A household can consider a member's migration as a possible livelihood strategy, and the determinants of this choice might not to be the same of other non farm activities choices.
The analysis confirmed the existence of a positive relationship between non farm activities and education, in line with a number of studies on income diversification (see*, inter alia*, Taylor-Naude, 2000 and Lanjouw *et al*., 2001). We also found a significant difference between remittances recipient and non recipient households with respect to primary education, while secondary and tertiary education appear to be relevant only for non farm activities. According to the findings of the field study, the relationship between education and off farm diversification could be mainly explained by what the rural population defined as 'enlightenment': although only a few of the most common non farm activities require a high level of education, education improves the ability to manage household's assets.
Household composition also plays a role in the choice of the household income sources; we showed that larger households – and particularly the ones with a high dependency ratio – have stronger incentives to search for sources of income other than farming, as they are able to maintain agricultural incomes unchanged even when some member engages in different activities. We also showed that private assets, as livestock or agricultural equipments, are unable to explain income diversification, contrary to the findings of a part of the relevant literature.
Conversely, community assets – as markets, hospital, extension services - are among the variables that better identify the households who diversify in non farm activities. The development of non farm activities was more pronounced where the access to health care facilities improved the health conditions of the rural population, where communities are better connected to periodical markets, where children have access to schools and where the availability of improved water sources frees up time for the women. All these factors improved people's ability to better cope with the vagaries of farming activities, providing them the opportunity to find alternative income sources.
The flip-side of the role played by these factors is that different communities – even within the same district – experienced extremely marginal opportunities to develop non-farm activities, thus reinforcing pre-existing inequalities. Geographical proximity can coexist with significant disparities in the access to basic services, and this – alongside with the availability of natural resources – represents the major divide among communities in Northern Ghana. When the factors that promote non-farm activities are lacking, internal migration represents a common strategy among the most vulnerable communities.

4) What are the connections between income diversification, poverty and income inequality?
The evidence in the literature on this issue is contrasting. Our results are consistent with Reardon (1997) and Reardon *et al.* (2006), who emphasized a positive correlation between non farm activities and household income level. In fact, there are some entry barriers to non farm activities that prevent poorest households from engaging in them. Moreover, our analysis showed a positive relationship between non farm activities and inequality, in line with Davis *et al.* (2007)[2]. Migration was found to be negatively related to household income, as it is an offspring of poverty; furthermore, migration contributes to mitigate income disparities, since even the poorest households are able to afford the costs connected to the domestic and the seasonal migration that largely prevail in this area of the country.

[1] Although such a combined dataset is unfeasible at the country level as the National Statistical Office did not disclose the relevant information, we were able to realize the matching for the three Northern regions as it was possible in this case to unambiguously associate each household to the corresponding community questionnaire.
[2] These results are relevant, although we maintain that a further distinction between high productivity and low returns non farm activities – following Davis *et al.* (2007) – would be necessary in order to better understand the full set of interactions between poverty, inequality and income diversification.

5) Which are the relationships between alternative household strategies as farming, non agricultural activities and migration?

The study emphasized interesting results about the interrelations among the different livelihood strategies. We showed – in line with Reardon (2006) - that income from non farm activities is often covariant with agricultural income, so that when the harvest is poor, there may be fewer opportunities for non farm earnings. Instead, migration, and hence the receipt of remittances, and diversification in non agricultural activities are two strategies that respond to different needs, and the households who adopt them often significantly differ in terms of their characteristics. Whenever a household is able to engage in some profitable non farm activities, it prefers to discard migration as an option. Migration of an household member does not appear to have negative consequences on farm productivity, and it could actually alleviate the pressure on scarce food resources.

In brief, although the role of non farm activities and remittances in Northern Ghana is becoming every day more important, this trend is a symptom of the crisis of the agricultural sector rather than a signal of the development of the area. Both the field study and the multivariate analysis suggest that non agricultural activities represent an option that better-off households - and communities - can resort to, in order to overcome the difficulties of the agricultural sector, and to meet a pressing need for cash.

The uneven distribution of the increase of non farm activities occurred without major structural economic transformations. There has been no relevant modernization process, but rather the incentives to develop the resources of this area worsened significantly as compared to the first 20 years after independence. The factors that are pushing towards a diversification of income sources and a minor reliance on subsistence agriculture are hindered by the absence of opportunities other than the market orientation of traditional economic activities. This explains why everywhere – but in the areas where new mine fields have been recently discovered - only traditional non farm activities have been on the rise.

A predominantly agriculture-based economy still represents the distinct trait of the area, where non-farm activities are closely intertwined with agriculture, the depletion of natural resources represents a serious threat to the livelihood strategies of rural households - that are becoming increasingly more food insecure - and internal migration is emerging as a relevant coping strategy to meet the household basic needs - so that it is unlikely to improve the household socioeconomic condition in the long run. Little wonder that this condition cannot be sustained for long.

Coherently with this perspective, we can advance a set of policy implications:

◊ Budgetary allocations to the Northern area of the country need to increase, as the current reliance on foreign aid is excessive and *per se* insufficient to promote the development of these regions. It should be combined with a greater effort to coordinate the various domestic and foreign actors that operate in Northern Ghana, in order to better allocate available funds, well identifying target areas and target objectives.

◊ Policy design should be reflective of local needs and it should build upon locally available resources, rather than pursuing a *one-size-fits-all* approach; the effective involvement of local District Assemblies is critical to achieve these goals.

◊ Development policies should be centered around agriculture; specific interventions should include:

- investments for irrigation projects to reduce the exposure of agricultural activities to the increasingly erratic rainfall pattern;
- efforts to increase farmer price for market-oriented products, through an improvement in market access; besides upgrading road and transport infrastructures, such an objective could be pursued through the institution of local cooperatives that could provide storage and marketing services, so to reduce the role of *middlemen*;
- greater fund allocations to the *District Agricultural Development Units*, as their services are critical for the introduction of better farming techniques;
- reconsidering the rise of some tariff barriers for some foreign produced goods, in line with the constraints established by international agreements, in order to stimulate some local produced items (e.g. poultry, rice).

◊ Even if non farm activities are generally reserved to the better off, their role in reducing household vulnerability has to be recognized. Thus, specific efforts should be paid to remove the barriers that hinder a broader diffusion of these activities, through the provision of credit facilities for set up of micro-enterprises. Such an initiative would meet also the farmers' needs. Nevertheless, growth in the agricultural sector represents the best way to foster the development of non farm activities, given the strong links between the two sectors.

◊ Environmental conservation could be hardly pursued through *command-and-control* policies that do not tackle the underlying causes of degradation. Instead, an increase in the incomes from farming activities would also contribute to reduce environmental degradation, allowing farmers to get rid of short-sighted farming techniques that lead to soil degradation, and reducing those factors pushing toward the spread of unsustainable non farm activities (e.g. felling trees or surface mining).

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Annex 1
Interview questions to the key informer

1) When the community has been founded?
2) What ethnic groups live in the community?
3) What are the main religions?
4) What is the language?
5) What is the exact location of the community (which sub-district or area council)?
6) What are the administrative and traditional institutions. What is their role and their importance?
7) List of the community based organizations (like farmers group, religious organizations, credit groups or whatever else) and their function
8) List of NGO's operating in the community, describe their projects
9) How well connected is the village by road?
10) Does the village has a power network?
11) What are the main source of potable water for the community? Who provide the service? Is it expensive for the community?
12) Does the community have toilet facilities?
13) Are there schools in the village? What schools (elementary, secondary)?. If there aren't, how far are the school from the village? Are they easily reachable?
14) Who provide the education service? Is the service accessible? (Are there any fees to pay to send children to school?)
15) Are there any health service facilities in the village? What kind of health service is it? If there aren't, how far is the nearest one? Is it easily reachable?
16) Who provides the health service? Are there fees to pay to use it?
17) What health services do people use?
18) Does the village has a telecommunications network (phone, mobile phone)?
19) Which are the means of transportation people rely most?
20) Which is the nearest local market (place, distance)?
21) Which is the nearest bigger market?
22) What are the main economic activities practiced in the community?
23) What are the main crops produced in the village? Which of them are mainly related to the market? Where are they sold? Inside or outside of the village? Does a trader exist?
24) What livestock are owned by the households? Which of them are commercialized? Where are they sold? Does a trader exist?
25) Which agricultural support services are available for the community? What public or private agricultural services exist? (for example: extension services, veterinary services, credit to farmers, input supply, crop or livestock traders)
26) Has the community experienced any changes related to land in the last 15/20 years? (for example intensification or extensification, land erosion, environmental problems, droop in yields, changes in land tenure regulation)? How is administrate the land? Are there any disputes on land?
27) What have been the main changes in the community over the past 15/20 years? What about changes in farming, in non farm activities, in migration choices?
28) Has the community been affected by any shocks in the last 15/20 years? (for example animal or crop diseases, droughts, drop in cash crop price..). Describe the event and its effects. How the community has recovered from the event?
29) Has the situation of the community been improving/worsening/staying the same?
30) Are there any other features of special interest to note?

Annex 2
Mixed community meeting discussion

The main purpose of this focus group is to understand the livelihood patterns of the community in the past 15-20 years.
We have to identify the main activities from which the community gain a living at present time so that we can make a comparison with the past. We'll try to identify the main reasons of the changes that have been occurred during that period.

The semi structured interviews will be conducted separately with a group of woman and with a group of men. We are interested in trends over the last decade, so people involved in the discussions don't have to be too young.
The discussion topics are listed below. The order of the questions can change, if it is more convenient for the proceeding of the discussion. By the end of the interview, the interviewer has to check that all the required information have been collected. If something has been omitted or is not clear, ask for more explanations.

Introduction to the focus group discussion:
Explain the mission:
I am an Italian researcher. I work with the University of Development Studies of Tamale.
Our mission is trying to understand if the activities giving a living to the rural households in Northern Ghana have had remarkable changes in the last 15/20 years.
So, we would like to talk with you about this and to collect your opinion.
We would like that you, who have been living in this community during the past two decades, think about how households used to gain a living 15/20 years ago and how they do it now, and tell us what are the main differences and the reasons why things have changed.
We are grateful that you have been able to spare some time to discuss with us. We encourage every one to participate and to express your point of view.

Start the discussion

Topics

I. **Main activities**

1) What are the activities the community members use to do to gain a living/money? List.

For each activity ask (or mark):

a. Is it nature resource based?
b. Is it mainly related to the market or to the household subsistence?
c. Is it seasonal or constant through the year?
d. What is the level of capitalization needed to start this activity? (Does the activity require an big initial investment?)
e. Does the activity requires particular skills? If yes, what?
f. What are the main risks and problems related to this activity?

II. **Comparison to the past**

General

2) Has this pattern of activities changed over the past 15/20 years?
3) If yes, what were the main activities 15/20 years ago?
4) Why the pattern has changed?

Farm activities

5) Regarding farm activities, does the community have different kind of activities than 15/20 years ago?
6) What are the main agricultural produce of the community?
7) What were the main agricultural produce 15/20 years ago?

8) Has the community started new farming activities? If yes, which?
9) If the farm activities have changed, what are the main reasons?
10) What about livestock? Have the community experienced any changes in livestock in the past 15/20 years?

11) Focus on particular crops: cotton, rice, tomato.
    For each of them ask:
    a. Does the community cultivate this crop?
    b. If not, why?. If yes, is it a profitable cash crop?
    c. Did the community cultivate this crop 15/20 years ago?
    d. Have the pattern and the profitability of this activity been changing since the last 15/20 years?
    e. If yes, ask why.

Agricultural Support Services

12) Are the Agricultural Support Services used from people in the village? (specify what we intend with Agricultural Support Service: extension officers services, veterinary services)
13) Has the provision of these services had any changes in the last 15-20 years?
14) What were the ASS provided 15/20 years ago?
15) Have they improved/worsened/stayed the same? Why?

Non farm activities

16) Which are the main non farm activities practiced in the community?
17) Does the community rely more/less/the same on non farm activities compared to 15/20 years ago?
18) If more or less, what are the main reasons?
19) What were the main non farm activities practiced 15/20 years ago?
20) Has the community started new non farm activities?
21) Which?
22) What is the percentage of non farm activities in household's income?

III. **Migration**

23) Does the community members resort more/less/the same to migration than 15-20 years ago? If more or less, why?.
24) Do people use to migrate for short periods or do they use to settle in their destination's areas? (seasonal or permanent)
25) Which members of the household generally migrate?
26) What are the benefit of migration for the community?
27) What are the negative consequences of migration for the community?
28) What is the importance of the money, of the food and the other goods that migrants send home? What are they used for?
29) Are these an important source of income for the households of the community? What is the percentage of remittances in household's income?

IV. **Land**

30) Does the community have experienced changes related to land? (for example intensification or extensification, land erosion, environmental problems, droop in yields, changes in land tenure regulation)
31) If yes, describe and discuss the problem and its consequences on community livelihood.

V. **Poverty and vulnerability**

32) What are the criteria distinguish wealth groups?
33) What are livelihood activities of the richest?
34) Who are perceived being the poorest? (note: it is not necessary an economic criteria)
35) What are the livelihood activities of the poorest in the community?

VI. **Shocks and general evaluation of well being**

36) What is the perceptions about the general well being of the community in comparison to 15/20 years ago?
37) Has the situation of the community been improving/worsening/staying the same? Why?
38) In the last 15/20 years, has the community been affected by any shocks? (examples: drought, animal or crop pests or diseases, drop in cash crop prices).
39) If Yes, describe the event and its effects (hunger, crop less, animal loss, etc..). When has happened?
40) How did the community recover from the event?

VII. **About women**

41) Has the women's role been changing in the communities in the last 15/20 years? If yes, how?

Annex 3
Background information on sample communities

Here, we briefly report some useful information[1] on sample communities, in particular on assets' access, in order to enable the reader to have a comprehensive view of the main features of each community.
Moreover, in the following pages we schematize the more important answers on the activities practiced in the early 1980s, on the changes occurred since that moment and on the livelihood strategies undertaken to face the new conditions.

1) LUNGU DABOTIN (BONGO DISTRICT - LUNGU AREA COUNCIL)

Population
The population of the community, according to Bongo District Assembly (2006), is 851 people. Their language is Gurune. In 2000, the community was part of a bigger community, named Lungu, composed by 2,289 people. Now the community has been divided into eight communities; all together they have a population of 3,523 people. The population has been increasing with a rate of 9 percent per year.

Activities in the early 1980s
- farming: early millet, late millet, sorghum, groundnuts, cowpea, local vegetables (bito, berisi, ayoyo, okro, yoga);
- livestock keeping;
- blacksmith;
- pito brewing;
- dawadawa processing;
- fiber.

How the contest has been changing since the early 1980s
Difficulties:
- infertile soil because of the overexploitation (due to continuous cropping);
- population increase, so that land is not enough;
- "rain stop early";
- increase in prices of food and other items (like clothes), so that households need money;
- animal diseases are more frequent;
- missing animals is a new problem ("criminality");
- no more free fertilizers, now they are too expensive and people can not afford them;
- no more enough animals to use cow ding.

Opportunities:
- new source of drinking water (borehole);
- better houses, roofed with zinc;
- accessibility to health care (even if it is far);

Livelihood strategies to face the new conditions:
- introduction of new crops (to supplement household needs): soybeans, maize, new brand of sorghum and of cowpeas, rice;
- less or none use of fertilizers;
- new non farm activities: trading and weaving baskets and hats;
- new livestock reared (pigs, rabbits, poultry) and improved varieties to meet the demand of the market;
- more seasonal migration of youth and women, to support relatives' needs (consumption, house, education). Remittances are an importance source of income;
- changes in the role of the women, now they have their own land to farm.

[1] The information on the number of inhabitants, on gender composition and on assets' access in 2000 are drawn from Census data we collected in the Regional Statistical Offices in Tamale, in Wa and in Bolgatanga.

Facilities
In 2000, there were no facilities in Lungu; the nearest were in the district capital, Bongo. Now, there is a school, that combines both primary and Junior Secondary School (JSS). The education service is regarded as quite expensive: there are no fees to pay, but households have to contribute for the food and for some other services provided from the school.
There is an health service for children below 3 years. The nearest clinic is in Balungu, but when the situation is critical people go to Bongo hospital. The use of the health service is improving, but generally only people who have money go to the hospital. The registration to the health insurance service is not common, people think it is too expensive for them.
The main source of water is a borehole, that has been realized with the contribution of the community members and the help of Word Bank. There is a second borehole not too far from the village, that has been provided by an NGO, *World Vision*.
There is not a telephone land line, but the community has been recently reached by mobile network. There is not a power network in the village.

Accessibility
The village is connected to Bongo - which is 5 kilometers far - with a dirt road, whose conditions are quite good. The nearest local market is in Balungu and it takes place every three days. Instead, the biggest market is in Bongo. There is not a trader for agricultural produce.

NGOs, groups and associations
There are a few groups in the village – e.g. some farmers associations, a weaving group and a blacksmith association.
There are two NGOs working in the community, one of them looks after orphan children.

2) NAMOO (TALENSI NABDAM DISTRICT - DATOKO AREA COUNCIL)

Population
In 2000, 407 people lived in Namoo (206 men, 201 women). There were 29 houses, the households were 57 with an average of 7.1 members. The community has been founded about 150 years ago. There are two ethnic groups: some come from the Gaare area, some others from Tindongo. The traditional religions are the most common. There is also a small group of Catholics. People speak Talene.

Facilities
According to the 2000 census, the nearest post office and telephone were at 24 km from the village; the nearest hospital at 25 km; the clinic at 16 km. There were no primary school and JSS in the village – the nearest were 2 kilometers far from the village -, and the nearest Senior Secondary School (SSS) was at 20 km from there, in Kulpeliga.
Now they have a primary school, which is public; it has three teachers, but only one of them is paid by the government, the others are paid by an NGO. There are no fees for the school, but books and clothes are quite expensive.
The nearest health facility is now in Datoko (around 7 km), which is not easy to reach. Nobody in the village has made the registration to the health insurance scheme. However, it is common to go to the clinic. Only somebody uses medicinal herbs.
The main source of water, even if it is not sufficient, is a borehole, that has been provided by an NGO. There are not toilet facilities. They are trying to introduce compost for the waste disposal.
There is not a power network but they have now applied for solar energy. The mobile network reach the community.

Accessibility
Only recently the village has became accessible by car even if the road is not good. From 2000, the road to the market has became practicable by car and on market days there is a bus to go there. The nearest local market is in Pelungu. Recently, they have created a little space near the

school where people can sell and buy things. Some traders come to buy rice and beans and others little things. The nearest bigger market is in Bolgatanga.

NGOs, groups and associations

There are some community based organizations: groups of women for rice and shea butter processing and a group for mango plantation. The latter activity has been promoted and supported by an NGO - *Savannah Resource Management* -, who provides animals to do the work. There is also an association of farmers to preserve the forest.

Groups of inhabitants use to take credit from *Savannah Resource Management* in Tamale. Other NGOs are working in the community and, in the past, they have been helpful in constructing infrastructures for the community (for example, the office for the school). One of them is trying to teach how to maintain the land, for example thought compost making.

Activities in the early 1980s

- farming: yam, sweet potatoes, early millet, late millet, cowpea, groundnut, sorghum, rice, maize, and vegetables (okro, bito, berisi, yoga), cotton;
- livestock rearing;
- hunting;
- fishing;
- shea picking.

How the contest has been changing since the early 1980s

Difficulties:

- declining fertility of soil (implying low yield);
- increase of crop pests and diseases;
- no more free fertilizers;
- no more animals to hunt because of the degradation of the forest;
- no more fishes in the river;
- worsening in veterinary services and diseases of animals;
- no more market for cotton.

Opportunities:

- discover of mines;
- education improvement;
- health improvement;
- water service improvement (there is a new source of drinking water);
- telecommunications: mobile works.

Livelihood strategies to face the new conditions:

- introduction of new crops: soybeans, bambara beans and new vegetables. Soybeans is a good source of income;
- no more cotton;
- gold mining;
- wood and charcoal sale;
- trading;
- new livestock: pigs, ducks, turkeys;
- women are now more involved in economic activities, even in trading and in sheabutter processing;
- women and youth resort more to migration than in the past, remittances are an important source of income for the households;
- groups of women for rice and shea butter processing. There is a group for mango plantation, activity that has been promoted and supported by an NGO.

3) DIE OR DIA (JIRAPA DISTRICT - KARNI AREA COUNCIL)

Population

In 1984, 543 people lived in the community. In 2000, population amounted to 792 people (379 men, 413 women). There were 104 households who lived in 63 houses. The average household size was 7.6.

The name of the community means 'we want peace', in fact it has been founded by people moving towards North West in search of peace. They are Dagaari and they speak Dagaree. Most of people are Catholics.

Facilities

In 2000 there was not any facility in the community. The nearest post office, telephone, hospital and SSS were in Jirapa, the district capital. The nearest clinic (a mission hospital), primary and JSS were in Kane (5 km from the village). We have not recognized any changes nowadays.
The only school in the community is a day care, where there is only a teacher provided by the *National Youth Employment*. Children use to go to school by walk. There is not a school fee, but often households are not able to afford the expenses required from the schools.
Consultations in the clinic are generally free and they are quite common, but drugs are expensive. A few people still use traditional medicine.
There is a power network, but it has not started working. There is not a mobile phone network.
The sources of water are two boreholes, the service is free. The community contribute to pay for repairing them. There is not toilet facility in the village.

Activities in the early 1980s
- farming: cowpeas, groundnuts, maize, millet, guinea corn, sweet potatoes, bambara beans, rice, maize, cotton, tomatoes;
- gardening;
- livestock rearing;
- craftmanship (mortar, masons, pestle making);
- pito brewing;
- dawadawa processing;
- sheabutter processing;
- weaving;
- trading.

How the contest has been changing since the early 1980s
Difficulties:
- fertility of the land has decreased, some places are sandy now. As a consequence, yield dropped;
- rain is no more reliable;
- increase of cost of fertilizers;
- animal diseases are more common;
- veterinary services are no more for free;
- increase of population;
- land disputes;
- price of cotton is now low and inputs cost too much;
- lack of labor in the farm because children now go to school;
- cholera, diarrhea and mosquitoes have increased.

Opportunities:
- improvements in access to school and in women literacy rate (now some of them are able to write their name);
- improvements in access to health (drugs are sold in the village);
- they have store for some provisions in the community;
- they have a machine to mill.

Livelihood strategies to face the new conditions
- introduction of new crops: improved cowpeas, soybeans;
- intensification of land use,
- people are more involved in farming for commercial reasons. For example, rice and groundnuts are commercialized in Kane;
- more people resort to temporary migration, especially the youth, but sometimes also the elders. Remittances are used mainly for consumption, they contribute just a little to household income;
- they started to burn charcoal;
- introduction of carcia trees plantations;
- people are more involved in trading;
- people resort to the market to buy food if it is not sufficient;
- it is more common to sell animals to buy food. Fowls are often sold and sometimes even the goats;
- groups of women have been formed.

Accessibility
The community is quite near to Jirapa (only 15 kms) and the road is quite good. Almost everybody has a bicycle. The nearest local market is in Diare and the biggest one is in Jirapa. There are some traders who come from Wa to buy and sell things.

NGOs, groups and associations
There are several groups, especially groups constituted by women (*Christian Mothers Association*; sheabutter group; local soap production group). Some of them apply to have credit from the bank, but it is rare that they obtain it.
At present, there are not NGOs working in the village. In the recent past, *ADRA* had a project of tree planting, that was very useful for the community.

4) WILLING OR WULING (JIRAPA DISTRICT - TUGGU AREA COUNCIL)

Population
In 1984 there were only 456 people in Willing, while, according to the last census data, 676 people lived here in 2000 (358 men, 318 women). There were 77 households, with an average size of 8.8 members, who lived in 53 houses.
It is an old community. They are Dagaba people and speak Dagaare. The most common religions are the Catholicism and the traditional ones.

Activities practiced in the early 1980s
- farming: groundnuts, bambarabeans, maize, cowpeas, millet, rice, yam, sweet potatoes, guineacorn, frafra potatos, tomatoes;
- livestock rearing;
- carving;
- weaving;
- gardening;
- pito brewing;
- dawadawa processing;
- sheabutter processing.

How the contest has been changing since the early 1980s
Difficulties:
- loss of soil fertility (now soil is sandy);
- drastic drop in yield (so they need to cultivate new crops);
- shortages of food during certain times of the year;
- animals live shorter now;
- people need money (the value of money has changed);

Opportunities:
- better access to health service;
- improvement in access to school.

Livelihood strategies to face the new conditions
- introduction of new crops: soybeans and cashew and improved cowpeas (thanks to extension officers);
- intensification and extensification of land use;
- increasing use of animals;
- they now rear pigs;
- now people sell the rice in the market, before it was only for consumption;
- now they cultivate tomatoes on large scale for sell;
- people rely more to migration, both young and old. Both permanent and seasonal migration. Remittances are now an important source of income. Used for consumption, to buy inputs for farming and clothing;
- groups of farmers and groups of women have been formed to perform certain activities together.

Facilities
In 2000, the only facility in the community was a primary school (a Catholic school); the JSS was 2 km far from the village, the SSS in Jirapa (16 km from the village).

The nearest clinic was 2 km far, in Tuggo, it is still there and it is public. The nearest hospital is 10 km far. Now they have also a public JSS. In the schools there are fees, but they are not so expensive.
They do not have still any health facilities in the communities, but villagers use the health service and the costs are moderate. The number of people enrolled in the Health Insurance Scheme is increasing.
Water does not seem a problem, they have six boreholes, and the service is free. There is a toilet for the school. The post office and the telephone are 1 km far from the village. The mobile network has not reached the community yet.

Accessibility
The community is well connected by road. The nearest local market is about 2/3 km far from the village, in Babile. The nearest bigger one is in Jirapa.

NGOs, groups and associations
There are some community based organizations, mainly groups of farmers who join in order to sell the crops. Only one of these groups tried to ask for loans to the bank.
There is no NGO working in the community at present, but one NGO is promoting a project for a day care. Some time ago, an NGO built a school.

5) KOTITO 2 (WEST GONJA DISTRICT - DAMONGO AREA COUNCIL)

Population
According to 2000 Census, the population of the village amounted to 912 people (484 men, 435 women). The houses in the communities were 174 and the households 165, with an average household size of 5.6 members.
It is a quite recent community. First settlements were Kocombas. During the Nkrumah's government, people from Upper East Region came to settle here because of the availability of fertile land. Now seven different ethnic groups live in the community. Frafra and Dagarbas are the most common.
Islam, Catholicism and traditional are all common religions.

Facilities
In 2000 there were no facilities in the communities: no post office, no telephone, no hospital, no clinic, no schools. The nearest facilities were in Damongo, at 20 km distance.
Now things are better. There is a public primary school in the village and also a new clinic in a near village, that is public and not expensive, even because health insurance is becoming quite common in the village. According to the assembly man, education and hospital attendance have improved.
Water access is a problem: they have only one borehole, but now it is not sufficient for the population of the community. Women use to weak up early in the morning to go to a stream quite far from the community to take the water.
Recently, some toilet facilities have been introduced in front of the houses.
Mobile phone works in the village, but there is not a power network.

Accessibility
The village is well connected by road, compared to the rest of the district. It takes 45 minutes by car from Damongo. The road is not good and they often have problems in the rainy season.
Bicycles and motorbikes are quite widespread.
Every Friday there is a market in the community and people comes from the near communities. It is one of the five major market centers in the district.

Activities practiced in the early 1980s's
- farming: yam, maize, guinea corn, beans, cotton, rice, tomatoes;
- hunting;
- sheabutter processing;
- thread from cotton;
- a little trading.

How the context has been changing since the early 1980s
Difficulties:
- rain pattern has become bad;
- erosion of the soil and loss of land fertility, so they need fertilizers (but they are expensive);
- poorer yields;
- higher cost of fertilizers;
- no more market for cotton (price are very low);
- water shortages;
- extension officers now come less often (only upon request);
- tomatoes are less profitable;
- no more rice because of lack of water;
- bush burning (it is both a strategy and a challenge).

Opportunities:
- improvement in technologies (higher crop production);
- improvement in medication for livestock, they die less than before;
- they have milling machine to process cassava into gari;
- use of chemicals and sprays to destroy weeds and against pests;
- availability of credit (even if they are not well disposed to group formation);
- education;
- improvement in telecommunication: mobile phone;
- better hospital attendance.

Livelihood strategies to face the new conditions:
- introduction of new crops: new kind of beans, new varieties of maize and yam, soybeans, cowpeas, yellow corn, cassava and tapioca, mango plantation, cashew;
- much more trading;
- new non farm activities: gari processing, weaving of hats and mats, weaving of ropes;
- bush burning (deforestation);
- introduction of donkeys;
- women are now more involved in farming, in trading and in food processing;
- migration of entire families to urban areas and consequent reduction of population.

NGOs, groups and associations
There are a few NGOs working in the community; they are involved in several fields: non formal education, support to agriculture, sanitation and community development (e.g. construction of a mill). Some of them have tried to work with groups of women to give them loans and to improve their activities (like shea butter processing), but the recovery was slow and the loans stopped. Moreover, it seems that it is very difficult for people here to form groups, maybe because of the coexistence of different ethnic groups.
Also the MofA officers usually ask villagers to work with groups of farmers. MofA has promoted the introduction of cassava and tapioca productions.

6) BUSUNU (WEST GONJA DISTRICT - BUSUNU AREA COUNCIL)

Population
According to the Census, in 2000, 1,819 people lived in Busunu (880 men and 939 women). There were 288 households who lived in 250 houses. The average household size was 6.3. In 1984 population was 1,117. The population growth rate is below the district level.
The community has been founded around 100 years ago. Gonja are the natives, now even Dagombas, Sissala and Wales live here. The most common language is Gonja. Islam and Christianity are the most common religions.

Activities practiced in the early 1980s's
- farming: yam, maize, groundnuts, sorghum, cassava, bambara beans, cowpeas, guinea corn, cotton, rice, tomatoes;
- livestock rearing;
- weaving (more than now);
- hunting and selling the meat;
- sheanut collecting;
- wood gardening;
- fuel wood (selling and using for cooking);
- tree cropping;
- petty trading (just a few, they used barter trading);

How the context has been changing since the early 1980s
Difficulties:
- less fertile land;
- land erosion;
- bush burning;
- rainfall pattern is not reliable (so people can't depend only on farm);
- need of money (for school and education);
- no more cotton because Cotton companies do not come anymore;
- no more rice because of the high cost of inputs and because they have no access to tractors;
- poorer MofA staff;
- less reliable advices from agricultural extension officers because of the poor rainfall pattern;
- they have to pay for water provision;
- worsening veterinary service, a lot of animals die;
- worsening of the road conditions.

Opportunities:
- technology;
- availability of water (tanks to technology and water, they have more time for business);
- loans to women from MofA and from the banks;
- increase in communication facilities (mobile phone);
- better access to market (now big vehicles come in the community);
- new useful services provided by MofA, like training on how to plant seeds and how to mix cropping;

Livelihood strategies to face the new conditions:
- introduction of new crops (because of technology and suggestions): soybeans, beans, cashew, jetrife (a crop used for making diesel);
- quite large use of technology in farming;
- more tree plantation;
- use of crop rotation;
- rearing of pigs;
- farmers now give housing, water and food to their livestock (in the past they were free);
- even women and children rear animals;
- new non farm activities (much more income comes from that activities because now they have markets): pito brewing, charcoal burning, soap making, groundnuts and sheabutter processing;
- women (especially the young) resort on migration. In the past there was no migration at all. The main reason is to collect money and good for the marriage. It is not an important source of income;
- groups formation: women for loans, farmers to sell things together.

Facilities

There are two primary schools and two secondary schools. There are no fees, but families have to buy school uniforms, text books, pen and pencils. The district assembly have a project to provide bicycles to children living very far from the schools.

Only recently a clinic has been opened but there is only a midwife who works there. For all the critical situations, people go to Damongo's hospital and almost 80 percent of the village population has registered to the health insurance.

Even if the water service is not free as before, it is quite good and its cost is affordable. There are not public toilet facilities.

The village has not a power network even if the Catholic church has a project to construct solar panels. Mobile phone works.

Accessibility
The community is 38 km far from Damongo and it is on the main road between Damongo and Sawla, on the way to Tamale, so it is well connected by road. Every Friday, there is the biggest market of the area, where poultry and fowls are usually sold.

NGOs, groups and associations
There are different groups of food processing and farmers. Some groups of women receive credit for their activities (e.g. sheabutter processing). There are some NGOs who work in the community and some of them give credit to these groups.

7) SUGUTAMPIA (SAVELUGU NANTON - DIARE AREA COUNCIL)

Population
The community has been established about 50 years ago as a community of fishermen.
The firsts who came to settle here have been the Dagombas, and they are still the major ethnic group who lives in the village. In fact, over the past few years, some others have began to live in the village.
In 2000, 455 people (240 men, 215 women) lived in the community. There were 72 households (with an average of 6.3 members per household) that lived in 56 houses.

Facilities
No facilities were available in 2000, and the situation is still the same. According to census data, the nearest hospital was 41 km far from the community. The nearest post office, telephone, clinic and JSS were – and still are - in Savelugu.
There is a borehole that is assisted with pumps, although some households still send their children to collect the water from the river. The community is in charge of the maintenance of the borehole.
There are no schools in the village; primary school – that is shared with other two communities – is 3 km away from the village. The closest JSS is in Diare, 12 Km away from the village, while the closest SSS and Technical Schools are either in Savelugu or in Pong Tamale, but just a few of the children keep on studying after the JSS. Children walk to the primary school, while there is a problem with respect to the access to the JSS: most households cannot afford a bike, so that they need to send their children to live in Diare, where they can be hosted by some relatives. All the schools are public and there are no fees to be paid.
There are no health service facilities in the village. Sometimes there is a nurse who comes to visit the community, otherwise people need to walk all the way to Diare to see a doctor. But the service is expensive, so that people also resort to black and herbal medicine, or – when they go to Diare – they do not go to the doctor but they rather go directly to the drugstore, where they look for advice and buy the recommended drugs. With respect to delivery, most of the women are assisted by elder women, as it is not possible for them to walk all the way to Diare. The health service is public and it is on a payment basis. Only a few households are covered by the recently introduced NHIS. It is difficult for them to register, as here men have more than one wife, and the system does not recognize these families that remain uncovered.
Mobile phones works in the communities; they are recharged in Diare as there is not a power network in the village.

Accessibility
The community is located 12 km from Diare. The road to Diare is not so bad, even if sometimes it can be impassable during the rainy season. Most of the men ride a bike, while women walk. Only seldom they take a taxi to go back to the community, and up to 12 people are carried on a 5-seat car. The closest market is the weekly market of Diare.

NGOs, groups and associations

There are two NGOs who work in the community at the moment: *Gubkatamala*, who works mostly with the women, providing them with some support, i.e. technical advice, for their farming activities; and *New NGO*, that has recently built the first toilets in the village, although they are not still working because the NGO has built the cement infrastructure but the community itself is in charge of completing the toilet facilities.

There is a farmers' and a fishers' group, the first group is currently training farmers with respect to irrigation, while the main role of the second one is to market the fishery, that is mostly sold to private transporters who come to the village and then drive the fishery to the Kumasi market. The role of both groups is also to act as 'lobbies', to solicit credit for their activities from donors, like the NGOs, and from the local authorities.

Activities in the early 1980s
- fishing;
- selling fish;
- a few sheabutter extraction, parboiled rice and groundnut's oil extraction, kulikuli (biscuits from groundnuts).

How the contest has been changing since the early 1980s

Difficulties:
- no more water in the river;
- a few fish;
- no more money to buy tools for fishing;
- population increase;
- land erosion;
- drop in fertility and in yield;
- warning environment;
- rice is less profitable because of rainfall pattern and because the demand is lower;
- even tomatoes are difficult to sell now because there is no market.

Opportunities:
- now they have veterinary services;
- advantages in technology and in communication (bicycles, motorbikes, radio, mobile phone);
- "enlightenment";
- more education;
- NGOs working in the area;
- recent project to move toward irrigation in agriculture, sponsored by MofA, but they are still working on it.

Livelihood strategies to face the new conditions:
- they have started farming at the beginning of 1990s;
- recent introduction of new crops: cassava, tomatoes (10 years ago), beans, watermelons;
- extensification of cropped land because of drop in yield;
- they rear more livestock;
- they are much more involved in non farm activities;
- new non farm activities: masonry, carpentry, barbering;
- introduction of mango plantations;
- less migration of men (they used to temporally migrate for fishing);
- new kind of migration: young girls go to South to find a job, but it is not an important source of income for the household;
- women are more involved in economic activities.

8) YILIPANI (SAVELUGU NANTON - SAVELUGU AREA COUNCIL)

Population

It is an ancient community of Dagomba people. 545 people lived in Yilipani in 2000 (283 men and 262 women). In 1970 the population was 175 and in 1984 it was 204 people. The number of the households was 98 (with an average of 5.6 members per household) and the houses were 31.

Activities in the early 1980s
- farming: maize, groundnuts, beans, bambarabeans, yam, tomatoes, cassava, pepper, millet, cotton, tomatoes;
- sheabutter extraction;
- groundnut's oil extraction;
- rice parboiling;
- livestock rearing;
- weaving (mats).

How the contest has been changing since the early 1980s
Difficulties:
- land erosion;
- drop in yield;
- droughts;
- poor rainfall that means less water;
- population increase, so that there is an increased pressure on the land;
- difficulties in access to land;
- cotton is no more profitable.

Opportunities:
- better veterinary services;
- boreholes constructed by an NGO, so that they now have drinking water;
- machine to grain the flour (maize and millet);
- improving in communication: better road to Savelugu, now it is practicable by car;
- "enlightenment";
- more market for weaving;
- agriculture extension services begun, even if the agric officers comes only occasionally;
- better market for sheabutter;
- toilet facilities provided by an NGO;
- now they have some tractors;
- better telecommunication: mobile phone works.

Livelihood strategies undertaken by people to face the new "situation"
- new crops: soybeans (introduced by an NGO), cowpeas, rice;
- no more cotton;
- maize is now the main crop;
- more non farm activities, that are the same as in the past;
- new activity: trading both in agricultural produce and in processed food;
- migration: some men go for short periods to farm in other communities where the land is more fertile;
- households rely more to the market to feed themselves;
- groups of women and farmers have been created to work with NGOs.

Facilities
The nearest post office, telephone, hospital and clinic are in Savelugu. The main source of drinking water are the boreholes built by *World Vision*. They have also toilet facilities.
There are no schools in the community. Both the primary and the JSS are in Tarikpaa, 3 km away from the community, while the SSS is in Savelugu, 6 km away. The lack of a school in the community represents a major problem, as the schools are too far away for the children – especially those aged 4 to 6 years – to walk there. The community is plagued by a low enrollment rate and by many school drop outs. Few of the children enroll to the JSS. The schools are public and there are no fees to be paid.
There are no health service facilities in the community, and the nearest clinic is in Mogla, 6 km far from the village. This represents another serious problem, as it is hard to get there and the services are charged with user fees, as the households are not registered with the NHIS. As the clinic is expensive and far away, most households still resort to traditional medical practices.
Mobile phones work there, but they are brought to Tarikpaa to be recharged.

Accessibility
The village is 6 km away from the main surfaced road. The road is maintained every year, otherwise it becomes difficult to reach the main road. Men ride the bikes while women rely only on their feet. The nearest market is the weekly market of Savelugu.

NGOs, groups and associations

There are a farmers' and a women's group. The role of both is to make sure that any NGO who is operating within the district, is brought to the community, in attempt of trying to convince them to begin some development project. In particular, the women's group search for credit programs from possible donors, and ask for some capacity building project from the district assembly.

An NGO drilled three boreholes in the community to provide a drinking water source, and they also built some toilet facilities, that are nevertheless insufficient to cover the needs of the whole community, so that some households still have to go out in the bush.

Annex 4

Table A4.1 Definitions of the income categories employed in the computation of the Theil index