Chapter 3
Shifting Rainfalls, Shifting Livelihoods: Seasonal Migration, Food Security and Social Inequality in Northern Ghana

Benjamin Schraven and Christina Rademacher-Schulz

Abstract This chapter examines the interrelationship between rainfall variability, migration, and social inequality in a savannah district of Northern Ghana affected by environmental change. The analysis shows that seasonality is a crucial factor shaping smallholders' livelihood decisions in semi-arid Northern Ghana, an area characterised by a unimodal rainfall. This pattern of rainfall allows one half-year rain-fed production cycle only. Seasonal migration is an important strategy in response to temporary food shortages, which are exacerbated by environmental and climate change. Study results show that the traditional migration during the dry season has increasingly shifted toward the rainy season—especially among poorer and vulnerable households. Rainy-season migration reduces the farm household's labour availability, which in turn leads to reduced crop yields and lower food security. Interviews with local people reveal that most migrants perceive rainy-season migration to the mining sites (*galamsey*) of Ghana as more promising than rain-fed subsistence agriculture at home despite the severe dangers and likewise uncertain outcomes associated with *galamsey*. Only if migrants can remit, do they compensate for their absence during the main time of farm activities at home. Otherwise, households face the risk of increased food insecurity and vulnerability. A majority of migrants, however, prefers non-agricultural professions and some have already invested in these activities. Thus, the temporal shift in seasonal migration leads to a significant shift in livelihood preferences among the poorer and highly vulnerable households, and a concomitant reduction of the importance of subsistence agriculture for the local population.

Keywords Seasonal migration · Subsistence agriculture · Food security · Social inequality · Ghana

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3.1 Introduction

In the academic debate on the linkages between environmental change and human mobility, migration is increasingly understood as an important response to manage the adverse effects of ecological change. Moreover, when perceived as a response to poverty, social marginalization, and global environmental change, migration serves as a means to reduce vulnerability and increase livelihood security (Tacoli 2009; Black et al. 2011; Scheffran et al. 2012; Faist and Schade 2013). However, it is not the permanent migration of whole families or households that makes human mobility an essential response to climate change, environmental degradation or poverty. Time-limited forms of migration, which are primarily undertaken by individual family members, are most common in this regard. And seasonal migration plays a key role (Foresight 2011; Warner and Afifi 2014; Jaeger 2009).

In the overall debate on climate change and adaptation, there is a strong focus on the processes of coping and adaptation. Generally speaking, coping strategies refer to short-term livelihood reactions to unplanned or unforeseen crises following sudden events like floods. The reduction of food consumption and the sale of household assets are examples of such strategies. In contrast, adaptation refers to deliberate and long-term oriented adjustments of livelihood strategies in anticipation of—or in reaction to—external stimuli and stress, such as increased rainfall-variability (Nelson et al. 2007). Risk diversification and the establishment of new income sources via labour migration are typical adaptation strategies (Ellis 2000). Although coping strategies might undermine people's food security and erode their livelihoods (Cannon and Müller-Mahn 2010), it is an oversimplification to view coping strategies as unsustainable and adaptation strategies as sustainable. The adaptation debate is increasingly criticized for having a static perception that does not adequately take into account transformation processes in the context of societal change, profound changes of livelihoods or social mobility (Keck and Sakdapolrak 2013). Adaptation strategies promoted for those in the smallholder agricultural sector range from the implementation of crop-failure insurance to the installation of water-storage facilities. But these strategies are largely based on development pathways to which a smallholder does not have access. Livelihood transformation or social mobility processes leading out of smallholder/peasant agriculture are widely excluded in the debate. Cannon and Müller-Mahn (2010) perceive the current adaptation discourse as a threat to the prospects of poor countries' development and demand an integration of development and climate-change adaptation-related efforts under the joint umbrella of pro-poor policies.

In Ghana, internal seasonal migration, especially from the poorer northern savannah areas to the economic centres of the tropical south, has been an important mobility pattern since early colonial times. It also has been an important strategy to deal with environmentally or otherwise induced food insecurity (Anarfi et al. 2003). This chapter is based on a case study in Nadowli District, Upper West Region in

Ghana,[1] which is characterised by increasing rainfall variability and decreasing soil fertility—like most other parts of Northern Ghana. We will explore the dynamics between environmental change and the current manifestations of seasonal migration, and how these factors interrelate with social inequality and the changes in livelihood preferences.

The case study used a mixed-methods approach, consisting of a household survey[2] (n = 158), participatory rural approaches (PRA), and expert interviews. The livelihood situation was investigated in four rural communities—Takpo, Nanville, Zupiri, and Mantari (Rademacher-Schulz and Mahama 2012). A follow-up study, consisting of 32 qualitative interviews, was conducted in April and May 2013.

3.2 Northern Ghana Between Socio-economic Disparities and Environmental Change

In the early 20th century, the British colonial administration widely neglected the northern regions of today's Ghana. Colonial officers perceived the savannah areas of Northern Ghana as a *wasteful* possession that had no developmental prospects and at best could serve as a labour pool for the economy of South and Central Ghana. In the first half of the 20th century, the cocoa and mining industry in the south expanded steadily (Sutton 1989). The unequal treatment of the north by the colonial administration and post-independence governments manifested itself as a significant north-south divide in terms of poverty and other development-related indicators. According to the Ghana Statistical Service, 28.5 % of the Ghanaian population lives in poverty and 18.2 % in extreme poverty. However, poverty rates are unequally distributed among Ghanians. Less than 22 % of the whole country's population live in the three northern regions (Northern Region, Upper East Region, and Upper West Region), but half of its poor and 80 % of its extremely poor are residents of the north (Pickbourn 2011 [46]). Likewise, Northern Ghana notably lacks such things as healthcare facilities, transportation infrastructure, and access to water, sanitation, electricity, and housing.

The case study was conducted in Ghana's Upper West Region. Like most parts of Northern Ghana, it belongs to the West-African Guinea Savannah belt. In this ecological zone, the climate year is characterised by one wet season (traditionally

[1]Based on the country's case study of the Where the Rain Falls project http://whereterainfalls.org/.

[2]The unitary or homogenous household model, which was dominant in the economic research until the 1990s, implies that individual household member's choices are determined by the strategic goals of the household as a whole. This model has been replaced by a more heterogeneous household model with different members, individual goals, and individual economic spheres. Nevertheless, farm households are still perceived as a common board of consumption. Accordingly, the household was chosen as the major unit of analysis for this study.

from late April/early May to October with a peak in August) and one dry season (from November to late April/early May). Historical weather records from Wa (UWR) show that the second half of the 20th century and the early 21st century were characterised by an average annual rainfall of 1036 mm. A clear trend toward decreasing annual rainfall amounts can however not be observed in this region. But there are indications of rainfall variability as more than 90 % of the survey participants reported changes in the rainfall patterns over the last two to three decades. They noted an increased delay of the start of the rainy season, although the start of the dry season remained relatively constant. Furthermore, the participants observed an increase in the duration of intra-seasonal dry spells as well as an increase in the incidence of extreme rainfall events during the wet season (Rademacher-Schulz and Mahama 2012). These observations are confirmed by agro-meteorological data. According to Laux (2009 [130]), regional climate-change models predict a moderate increase in precipitation with high local variation, a shift in the onset of the rainy season, and an increase in dry spells for the next three decades. These trends include an increasing probability of extreme rainfall-related events, such as storm rainfalls leading to floods and droughts (van de Giessen et al. 2010).

These phenomena are putting pressure on the food security of the local population, whose majority (more than 80 %) is engaged in subsistence agriculture using traditional farming methods. Ninety-two percent of the households interviewed report a decline in crop yields, which severely affects the overall economic well-being of the households. Because animal production is also declining, the traditional *safety valve* of selling livestock in times of need to buy food is also under pressure. Furthermore, respondents report that food prices are constantly rising. From this it follows that household food security is at stake, particularly during the so-called *lean season* between May and August when food stocks are diminishing and the first rainy-season grains are not yet harvested. More than 80 % of interviewed respondents said that, in the past 5–10 years, they had experienced (severe) food shortages (Rademacher-Schulz and Mahama 2012) (see Fig. 3.1). Although the majority of the peasant population in Northern Ghana is socio-economically homogenous, different levels of wealth exist. And it is these differences that determine the degree of suffering experienced as a result of food shortages (Laube 2007).

Social and climate factors are not the only cause of food shortages. Environmental, economic or technical factors can also contribute to local food insecurity. These include low soil-fertility rates, poor road infrastructure, absence of non-agricultural employment opportunities, lack of access to modern farming technologies, and poor health of local livestock. Besides selling livestock, local farm households have developed both short-term coping strategies and longer-term adaptation strategies to deal with the temporary food shortages. The range of strategies available to a household threatened by food insecurity is in turn determined by the socio-economic status of the affected household. These strategies could be the sale of household assets, a reduction in the daily food intake during the lean season, modifications to crop production and—last but not least—seasonal migration.

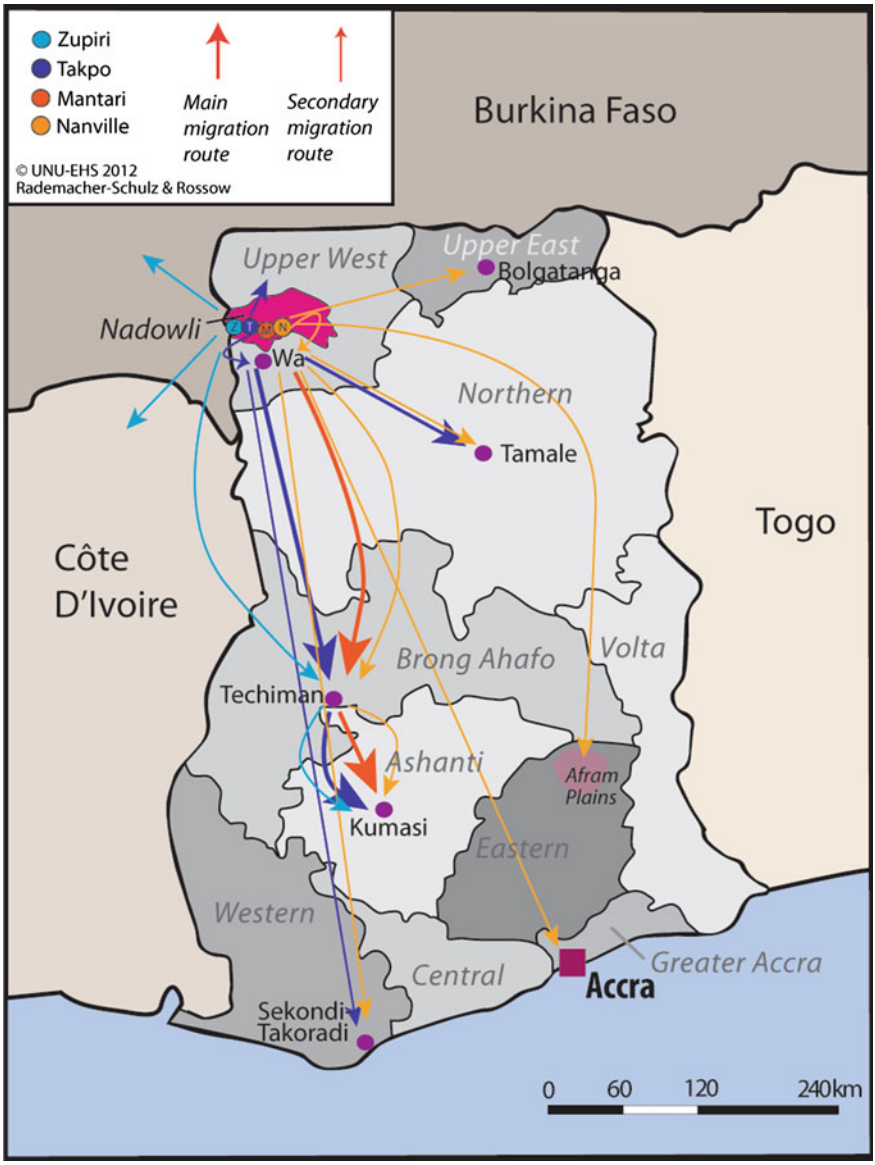

Fig. 3.1 Migrant destinations for the four researched communities in Nadowli District, Upper West Region. *Source* Household survey, 2011 (Rademacher-Schulz et al. 2014)

3.3 Significance of Seasonal Migration in Northern Ghana

Migration in Ghana is a familiar phenomenon. Over time, different forms of human mobility have evolved including both internal and international migration. In colonial times, the development of cocoa farms and gold mines in Southern Ghana attracted many northerners. With the support of the colonial administration, a dry-season north-south migration pattern developed which gained even more importance after independence in 1957. Since the 1990s, migration patterns have diversified as rural-to-urban migration has become more prominent and the independent migration of women and girls has increased (Anarfi et al. 2003; Awumbila et al. 2014).

Migration in its seasonal and more permanent form is a vital characteristic of people's lives in Northern Ghana. In an effort to diversify income, migration is a common means to overcome the limited local non-farm opportunities and to deal with the vulnerabilities related to rain-fed agriculture. Seasonal migration in particular contributes to food security. Migrants bring home money and food, they contribute to the household food production, their seasonal absence reduces the pressure on food stocks during the lean season, and in years of drought, seasonal migration is an important coping strategy for gaining access to food. According to van der Geest (2011), many farmers perceive their environment as "one in which food and livelihood security cannot be attained by farming alone, and in which seasonal migration is a necessary way to supplement what is produced at home" (2011 [605]).

For the Dagara in the Upper West Region, migration to Central Ghana—particularly the Brong-Ahafo Region (Codjoe 2006; Abdul-Korah 2007)—became increasingly important in the 20th century. In the 1930s and 1940s, many young men left because migration trips were largely perceived as adventurous experiences that provided young people the opportunity to escape social control in their home villages. They also got to see the *city lights*, which was related to the colonially induced image of northerners as savage or backward. In later decades, economic aspects of migration decisions became more important and seasonal migration became even more prominent (Abdul-Korah 2008). Since the 1950s, each year during the dry season, a large proportion of the population has migrated south to work as seasonal farm labourers. The south offers more favourable conditions for agriculture because it has two agricultural seasons, fertile land, and work opportunities in commercial plantations. For those who intend to stay longer, there are also leasehold arrangements (Luginaah et al. 2009). While labour demands peak in the middle belt, there are few employment opportunities in the home communities during the dry season (van der Geest 2011). Nevertheless, there are some indications that the conditions for north-south migration are deteriorating. Migrants report that increased mechanisation in commercial agriculture is leading to fewer jobs and labour exploitation. There are also problems finding accommodation and managing living costs (Amegashitsi 2009). Despite these challenges, most migrants still remit

food and money to their families to help cope with food insecurity, and they return home to work on the family farm during the rainy season. For these reasons, seasonal migration continues to be viewed positively. The negative perceptions of seasonal migration include health implications (i.e., sickness or the spread of disease), social implications (people return with *bad* habits), and economic implications (migrants don't return, which reduces the local labour force in the rainy season) (Schraven 2010; van der Geest 2011).

Migration flows from the study area reveal a dominant seasonal rural-to-rural migration pattern. The main destinations for migrants from Nadowli District are Brong-Ahafo and the Ashanti region in Central Ghana (Fig. 3.1). Economic activities of migrants mainly include farming (52 %) and mining (14 %), as well as some trading, civil employment, and domestic jobs. These findings are in line with research results from van der Geest (2011), who worked in the neighbouring Dagara community of Nandom, UWR.

3.4 Interrelationship Between Social Inequality, Food Insecurity, and Seasonal Migration

According to national statistics, the Upper West Region is the poorest part of Ghana. All households in our study area were found to be considerably below the international poverty level of 1 USD per person/day. In the Upper West Region, the mean annual income per person is 106 GH Cedis—about 66 USD per year or 0.18 USD per day. However, the national average in Ghana is nearly four times higher at 397 GH Cedis per year (Ghana Living Standard Survey 5 2008).

Despite the fact that nearly all households in the Upper West Region live below the poverty line, the economic situation of households in the Nadowli District is not homogenous, and social and economic disparities exist. To assess the economic status of a household using the household survey data, a wealth indicator was created using a livestock[3] and an asset indicator.[4] The quantity of each item owned was multiplied by its virtual market price[5] then aggregated. The analysis revealed that wealth differences among the households interviewed was pronounced, especially when female-headed and male-headed households were compared (see Table 3.1). Although gender roles have been changing over the past decades in Northern Ghana (Abdul-Korah 2011), gender remains a determinant for livelihood options—mostly to the disadvantage of women. It is still more difficult for women to access additional farm land apart from the family plots. Furthermore,

[3]Based on the possession of cows, pigs, goats and sheep.

[4]Based on the possession of motorcycles, bicycles, tractors, water storage basins, and mobile phones.

[5]Based on the underlying assumption that the relative prices amongst the selected items and animals in Northern Ghana have remained stable (Schraven 2010).

Table 3.1 Comparison of female-headed and male-headed households

	Female-headed households	Male-headed households
Number (%)	19 (12 %)	138 (88 %)
Dependency ratio[a]	Higher (156)	Lower (86)
Main economic activities	Petty trading, farming, migration, pito brewing[b]	Farming, migration (farming and mining)
Wealth indication[c]	Lower (37.8)	Higher (60.6)
Food security (mean)[d]	Lower (3.1)	Higher (2.6)
Land possession (mean, acres)	Lower (4.4)	Higher (60.6)

Source Household survey, 2011

[a]The ratio was calculated based on the number of children (aged 0–14) and elderly people (65+) divided by the rest of the household members, multiplied by 100

[b]Pito is a locally produced millet beer

[c]It consists of a wealth and livestock indicator

[d]Based on the survey: number of food-insecure months

female-headed households are often households where the husband has died or is staying away for a long period of time. The labour force potential of these households is therefore much lower than male-headed households (Laube 2007).

Because most households in the study area rely on rain-fed subsistence agriculture for their main source of income, their food-security status is dependant on the favourable distribution of rainfall during the rainy season. Figure 3.2 shows the responses of survey participants regarding the distribution of food-insecure months compared to the mean monthly rainfall data.

During and after harvest time in autumn and winter, households have enough food stocks. During the crop growing period though, most households run short of food. This lean season is referred to locally as *nadibo*, which means "what shall we eat?" One of the major coping strategies to overcome food shortages is seasonal migration, which is normally practiced during the dry season, a period when not much work can be done at home. A common statement related to food-security issues, given by an aged household head from Nanville, is "My children need to supplement household food needs by migrating to find money."

Interestingly, the survey analysis does not reveal any correlation between the level of a household's living standard and seasonal migration. But when taking into account the departure time of migrations in 2011, a correlation between food insecurity and migration during the rainy season can be found. During the dry season 2010/11 (November–March), one third of all migrants departed, and during the 2011 rainy season (April–October), two thirds of all migrants left. This is striking because it suggests a change in seasonal migration patterns. This was confirmed by participatory rural appraisal exercises. Interestingly, rainy-season migration is seldom mentioned in the literature on Northern Ghana (Rademacher-Schulz et al. 2014).

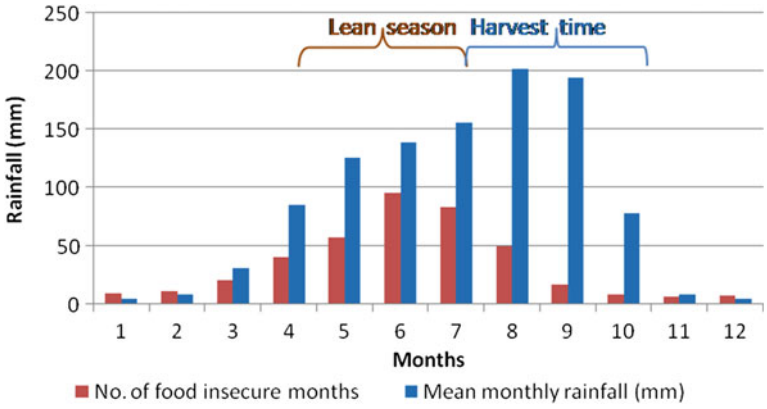

Fig. 3.2 Number of food-insecure months and mean monthly rainfall. *Source* Household survey, 2011 and rainfall data from Wa climate station (1952–2011)

Table 3.2 Characteristics of dry and rainy-season migrants' households (HHs)

	Dry season migrant's HHs	Rainy season migrant's HHs
Sex distribution	3/4 male, 1/4 female	3/4 male, 1/4 female
Generation	Sons or daughters	Sons or daughters
Main economic activities	Farming, mining	Farming, mining
Students	Higher (35 %)	Lower (5 %)
Wealth indicator	Higher (53)	Lower (44)
Food security	Higher (3, 1)	Lower (2, 3)
Goats possession (mean)	Higher (13)	Lower (6)

Source Household survey, 2011 (see Rademacher-Schulz et al. 2014)

The comparison between dry-season and rainy-season migrants' households (Table 3.2) clearly shows that rainy-season migrants' households are generally poorer, suffer more from food insecurity, and perceive their *safety valve*, which is livestock (expressed here by the number of goats), as depleting. They therefore can no longer rely on selling animals to buy food and instead opt for rainy-season migration. Migrants primarily go to the cocoa- and maize-belt zone which has a high demand for labour between April and October. However, this coincides with a time that labour is needed on the farms in their home community. In this way, these households jeopardize their next year's food security by migrating during the rainy season.

To better understand the overall situation of households, analyses of rainfall distribution and crop production for 2011 were undertaken. 2011 was characterised by a negative rainfall anomaly (an unfavourable distribution of rainfall interspersed with several dry spells) and by a significant drop in sorghum and groundnut production (Rademacher-Schulz et al. 2014 [3–4]). The usual strategies invoked to

satisfy immediate food needs, such as selling the cash crop groundnuts and livestock, were thus not available for many households.

The primary motives for migration during the rainy season are twofold. Some households have an acute need for income to buffer household food shortages, which can be labelled an *ex post* coping strategy. Other households, which are anticipating a bad harvest and resultant incomes losses, try to head off a future crisis situation, which can be labelled an *ex ante* risk-management strategy (Ellis 2000). For poorer sections of the population, seasonal migration functions mainly as a survival strategy. Poorer households have to use part of their income from seasonal migration to buy food, whereas better-off farm households are likely to use remittances for investments and non-food consumption (see van der Geest 2011 [606]).

3.5 Perceptions and Aspirations of Migrants in a Changing Context

In addition to the survey and PRA sessions, 32 qualitative interviews were conducted in April and May 2013 with migrants who had gone south during the previous rainy season or during the past years. Thirty-one of the migrants interviewed were male and only one was female, and the average age was 26 years. Most of these migrants did informal gold mining—*galamsey*—in the Ghanaian middle belt during their rainy-season trips. A minority was involved in farming or other economic activities during their stays.

In response to questions about why they migrated during the rainy season, more than half mentioned the economic prospects for doing *galamsey* during that time are better than during other times of the year. Only nine migrants stated that they went during the rainy season because their respective households were running out of food. Four respondents said that they had left during the dry season but simply did not have enough money for the transport back home at the beginning of the rainy season. The remaining two respondents indicated that they stayed in the south due to family responsibilities in the destination areas. When asked about the overall benefit of migrating, 18 respondents stated that it would have been better to stay in their home community; ten respondents felt their migration trips were beneficial; and four respondents were undecided. Nineteen respondents reported that their families' view of rainy-season migration was largely negative. However, some respondents implied that their own and their families' perception were largely determined by the amount of money they earned with *galamsey* or farming in Southern Ghana. A 24-year-old migrant said:

> My family is not always happy when I go to the south to do *galamsey*. It really depends on whether I can manage to bring them some money or food back home.

Remittances sent home by migrants are mainly used for fertilizer and food purchases that basically compensate for the lower yields, which result from the migration-related reduced manpower during the rainy season. During the absence of migrants, it is mainly the younger, often underage, siblings' and older relatives' responsibility to take care of rain-fed agriculture.

Besides the need to support their families, the preference for rainy-season migration is also related to the migrants' wish to earn money for their own purposes —the purchase of electronics, paying for an apprenticeship, building their own house. But the underlying reason why rainy-season migration is a preferred choice for many migrants is the uncertain nature of rain-fed agriculture in their home communities.

In addition to the difficult infrastructural challenges and the decreasing soil fertility—which can be mitigated with fertilizer application—increasing rainfall-variability contributes significantly to the uncertainty of rainy-season farming in the migrants' views. A 21 year old said: "It is better I go to the south during the rainy season and do some *galamsey*. It is more beneficial than farming here as the rains are becoming more and more unreliable."

Galamsey is dangerous work due to frequent industrial accidents such as collapsing pits (Aubyn 2009), and the financial outcomes are very uncertain. Despite these risks, rainy-season migration to the *galamsey* sites has become the preferred *gambling game* over rain-fed agriculture. An 18-year-old migrant put it as follows: "It depends on the rains. If the rains are good for us, staying here and farming is good. But the probability of getting something in the south is higher than here."

Nonetheless, this does not mean that migrants are willing to reject small-scale agriculture out of hand. Only three respondents stated that they could imagine that their respective families would one day give up farming completely; although two respondents reported that they had actually given up farming already. The majority of respondents said that they would never give up farming but they would maintain it at a reduced or minimal level in favour of migration or other economic activities. Pragmatic, economic reasons were cited for continuing to farm. Eighteen respondents took the view that the labour invested in subsistence farming saved money as it reduced the portion of cash income needed to purchase food. A 32-year-old household head said: "I will never stop farming as it simply saves money."

Only nine respondents considered subsistence farming a part of their cultural identity, a notion that would discourage them from giving up farming completely. The relative loss of importance of farming is also reflected in the desire of nearly all migrants to invest money earned during their rainy-season trips in non-agricultural activities like trading or non-agricultural apprenticeships (e.g., car mechanic, construction trade). Almost half of the respondents were saving money for an apprenticeship programme or other non-agricultural activity, or have concrete plans to do so.

3.6 Conclusion

Evidence from the Nadowli District of Ghana's Upper West Region shows that environmental change in Northern Ghana is an important factor that has turned subsistence farming during the rainy season into an ever more risky endeavour. Increasing rainfall-variability leading to a higher probability of heavy rainfall events and intra-seasonal droughts increase the risk of harvest failures. They also enhance the risk of food insecurity particularly for poor and vulnerable households. Exposure to the increased risk of food insecurity has also had an interesting impact on seasonal migration patterns. In the traditional seasonal migration pattern, young migrants from Northern Ghana left their families at the beginning of the dry season (around November or December) to work in the commercial agriculture or mining sector in Southern Ghana and returned around April and May to start rainy-season farming in their home communities. Basically, the advantages of dry-season migration are financial, material and social remittances, and reduced household food stress.

Survey results show that the formerly dominant dry-season migration pattern is no longer the norm. Migrants from poor and vulnerable households prefer—or are forced to—migrate during the rainy season and thus cannot support their families by doing rain-fed subsistence agriculture. Most of the migrants moving to the south during the rainy season perceive their trips as some sort of a gambling game. It is a game which is more attractive than rain-fed agriculture, despite the fact that informal gold mining or *galamsey*, the preferred destination sector of most migrants, is dangerous. The prospect of danger and uncertain financial earnings are more attractive to migrants than the tedious work on the home farms during the rainy season, which often results in poor harvests. If migrants cannot manage to remit money, food or other material goods to their families during their rainy-season trips, they put their households at risks of a downward spiral into abject poverty. The loss of the labour force on the family farms that is not compensated with remittances usually leads to reduced harvest amounts and hence decreased food security. In short, the example from Nadowli District provides evidence that migration in the context of environmental change is not per se an adaptation strategy, as it may put already poor and vulnerable households under additional food and livelihood stress. But it is not only a temporal shift in seasonal migration, it is a change of livelihood preferences as the migration patterns are also associated with a reduced commitment to subsistence farming. Although a large majority of migrants interviewed want to maintain rain-fed agriculture on their family-farm plots, they want to do so at minimum levels for pragmatic reasons. Most respondents cited non-agricultural professions as their future aspiration and were making plans accordingly.

This case study calls for a new paradigm, one that would resolve the contradictions between climate-change adaptation and development, and transform the simplistic coping/adaptation frameworks into a more holistic approach that takes into account young people's aspirations and the perceptions that shape their actions.

Although still a concept in the making, social resilience, which is also based on a transformative capacity along with coping and adaptive capacities (Keck and Sakdapolrak 2013), could be a component of such a concept. The ongoing loss of importance of (smallholder) agriculture together with an increased orientation toward non-farm jobs in Northern Ghana can indeed be labeled a transformation process that has the potential to increase the future well being of the poorest and most vulnerable households.

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