Social Vulnerabilities in Environmentally Induced Migration: Evidence from Mali and Senegal

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Introduction

In the West African Sahel, the impact of environmental change and climate variability on human populations is a major global concern. People in the region are faced with an extremely variable rate of rainfall as well as land degradation as a result of climatic changes and human activities to which they have to adopt adequate adaptation strategies (Cline 2007, Mertz et al. 2009, Mertz et al. 2010, Samimi and Brandt 2012). The majority of the population in this region depend on small-scale and subsistence farming and livestock breeding and are thus highly vulnerable to climatic and environmental changes.

Migration is one possible response to environmental changes. However, migration in areas affected by environmental change can be regarded either as a failure to adapt to environmental changes, as a strategy of individuals and households to reduce their vulnerability to environmental and non-environmental stresses, or as a key component to secure livelihoods (Tacoli 2011a, Tacoli 2011b, McLeman and Smit 2006, Scheffran et al. 2012). In the West African Sahel, migration is very common and an important part of their livelihoods (Adepoju 1995, Black 2001). Particularly, circular migration during the dry season is considered as a livelihood strategy to diversify income and to reduce the household's vulnerability to environmental stress.

There is increasing consensus in the academic debate on environmentally induced population movements that migration is a multi-causal phenomenon which is usually influenced not only by environmental drivers but also by cultural, economic, political, and social conditions (Adamo and Izazola 2010, Black et al. 2011, Laczko and Aghazarm 2009, Piguet et al. 2011, Renaud et al. 2011, Warner et al. 2010). The role and weight of environmental factors in migration decisions are highly controversial and remain unclear. Some scholars even argue that migration in areas affected by environmental change is in fact not (initially) caused by environmental deterioration as such but by disparities of development that generate vulnerabilities to environmental change (Lonergan 1998, Black 2001, Jonsson 2010). It is thus important to consider development issues in the research on the link between environmental change and migration. This requires also to consider or to overcome what Bakewell (2008: 1342) calls the 'sedentary bias' in development-migration research, meaning that the idea of development often tends to cast migration as problematic and "a response to crisis rather than a 'normal' part of people's lives" (Bakewell 2008: 1345, Castles 2011, Morrissey 2012).

People's vulnerability and adaptive capacity to environmental changes are important aspects that influence the debate on environmentally induced migration and which are closely linked to development. Social vulnerability can be defined as "the ability or inability of individuals and social groupings to respond to, in the sense of cope with, recover from or adapt to, any external stress placed on their livelihoods and well-being" (Kelly and Adger 2000: 328). Social vulnerability can be gauged on the basis of several indicators such as socio-economic status, sex/gender, ethnicity, age, occupation, family structure and educational level (Cutter et

al. 2003). While some scholars argue that the impact of environmental changes affects men and women differently and creates gender-specific vulnerabilities (Denton 2002, Hunter and David 2011, Terry 2009), little is known about the impact of formal education on vulnerability and migration (van der Land and Hummel 2013).

This paper aims at illustrating under which social-ecological conditions migration is an adaptation strategy to environmental change by emphasizing the role of education and gender as relevant dimensions of social vulnerability to environmental change. We argue that the level of formal education and gender have a major impact on people's migration decisions and determine whether migration can be considered as an adaptation strategy to environmental changes. Drawing on qualitative and quantitative data, we examine the differences in migration motives between men and women and among people's levels of education to identify how social inequalities and vulnerabilities shape migration decisions in the context of environmental changes.

Study areas and methods

This paper is based on research conducted within the interdisciplinary research project "micle – migration, climate change and environment" funded by the German Federal Ministry of Education and Research (www.micle-project.net). The project examines the interdependencies between climate- and environmental change (with a focus on land degradation) and migration in two study areas in the West African Sahel (Hummel et al. 2012).

The West African Sahel experienced a substantial decrease in rainfall from the 1950s until at least the late 1980s, with severe droughts in the 1970s and 1980s. In addition, the Sahel has been identified as one of the regions that are particularly vulnerable to future climate change with a particular impact on human livelihoods (IPCC 2007).

The empirical research was carried out in two rural study areas in the West African Sahel: Bandiagara in Mali and Linguère in Senegal (see Figure 1).

Figure 1: The study areas: Linguère in Senegal and Bandiagara in Mali

The study areas were selected for several reasons: a) they suffer from highly variable precipitation and changes in vegetation and are considered likely to be affected by future droughts and land degradation; b) subsistence farming and livestock breeding are the main

sources of income in both areas, which means that people are considered extremely vulnerable to environmental changes; and c) both areas are characterized by high population dynamics with a high out-migration (ANSD 2004, Bocquier and Diarra 1999).

The empirical research was carried out at two spatial levels. It was conducted: a) with villagers in the two selected study areas of Bandiagara and Linguère, and b) with migrants originating from the two study areas in the national capitals, Bamako and Dakar.

The field work was done in two phases: in an explorative phase from February to April 2011 and during a main field phase from January to April 2012. A mix of methods was applied by combining different qualitative and quantitative methods (Flick 2008).

- The explorative phase included qualitative interviews and participant observation as applied methods in the two rural study regions, and was designed to prepare the main field work in 2012.
- During the main field phase a quantitative survey with 900 people was conducted, thereof with 700 people in the selected study areas and with 200 people from these regions now living in the capitals. In addition, we draw on about 60 qualitative interviews with people from the study areas – with and without migration experience.

Interviewees and participants for the survey in the villages were selected randomly; they were of differing age, education, ethnicity and gender, either with or without migration experience. In the two capitals, people from the study areas were identified by a method mix of migrant tracking and snowball sampling (Diekmann 2005, Urry 1999).

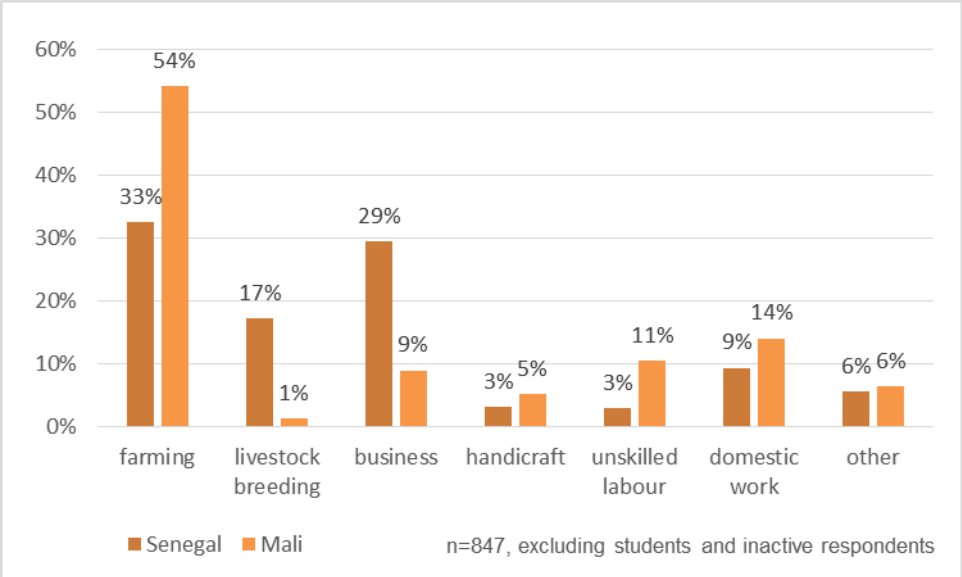
In the standardised analysis, cross-tabulations were applied to identify relationships between different attributes/variables. Statistical significance was tested by applying chi-squared (χ^2) tests (significance level $p \leq 0.05$). For analysing the role of formal education, three categories of education were used: 'no formal education', 'primary education'; and 'high level of education' which includes secondary and university education. The social vulnerability of interviewees to environmental stress has been operationalised by the main economic activities of the survey participants and their families and the environmental sensitivity of these activities, the level of formal education and the migration motives behind the initial and last migration. The qualitative interviews have been analysed by applying a content analysis with different categories (Mayring 2007). The citations from the interviews in this study were translated from French into English by the authors. In this study the qualitative research aimed at gaining a deeper understanding of the living conditions and social norms and expectations related to gender and vulnerability, and to gather deeper information about people's motives behind their migration.

Results and discussion

Formal education reduces vulnerability to environmental changes

Agriculture is the main economic activity of the study participants' families (89%) and for half of the survey participants themselves. Arable farming makes up the largest proportion of survey participants' activities, with a higher percentage in Mali than in Senegal (54% versus 33%) where livestock breeding constitutes another important source of income (17%) (see Figure 2). Among the Senegalese survey participants, trading in commodities such as car tires or agricultural products is another important source of income (27%), while the Malian respondents are more likely to work as craftsmen or unskilled labourers (28%) such as watchmen or housemaids. Non-agricultural activities are more often named by participants surveyed in the capitals.

Figure 2: Main economic activities of the active survey participants



The majority of the active survey participants have more than one source of income (76%): respondents mostly combine arable farming with livestock breeding, small-scale business or gardening – to spread the families' risk to environmental stress. Respondents with an increasing level of education and a non-agricultural activity are more likely to engage in a sole economic activity.

The level of education is very low among the participants of the survey: 76% of the participants have not obtained a formal education. The level of schooling enjoyed by the survey participants differs between the two study areas and between men and women, with a higher level of formal education found among the Senegalese respondents (27% versus 19% in Mali) and men (27% versus 19% for women). The differences in formal education are particularly high among the youngest participants (aged 18 to 30) where 52% of the Senegalese survey participants have no formal education, compared to 70% in Mali. Although most of the youngest participants (61% of the 18- to 30- year old) still have no kind of formal schooling, our results show a general trend toward education, which can be confirmed by current literature on schooling enrolment (UNESCO 2012).

The results of the quantitative analysis show a significant relationship between the survey participants' level of formal education and their main economic activity ($p < 0.001$). Although some studies oppose the link between formal education and people's economic activity (Weyer 2011, Ndiaye 1998), our results reveal that the probability of becoming involved in an economic activity outside the agricultural sector rises with their level of education. The lower their level of education, the more likely the respondents are to rely on agriculture as their main source of income while participants with a high level of formal schooling are more likely to be involved in business or in other sectors such as administration, health or teaching not directly dependent upon climatic or environmental factors. Thus, people with a formal education, particularly the better educated, seem to be less vulnerable to environmental changes since they are less dependent on climate-sensitive economic activities than participants with no formal education.

Migration in the study areas

The results of the survey suggest that migration today is relevant for both men and women. Most of the survey participants (81%) had left their village of origin at least once for more than three months.

Our results show no significant relationship between people's migration experience and their level of education, neither for men nor for women. This contrasts the argument of some authors that educational attainment enhances the mobility of people in general and with regard to gender that women are less mobile than men due to their lower education level (Adepoju 1995 and 2002, de Haas 2008, Jungehülsing 2010).

In view on gender and migration experience, the results show that a slightly higher percentage of men than women (87% versus 75%) have own migration experience. However, while the results demonstrate an almost equal distribution of migration experience of men (81%) and women (78%) in Senegal, there is a difference between the migration experience of men and women in Mali (94% versus 70%).

The qualitative interviews suggest that female labour migration predominantly applies to unmarried young women in both study regions. The difference in migration experience between men and women in Mali might result from the lacking social acceptance or the interdiction of female migration in some parts of the Malian study region. Some village elders impose restrictions against the migration of women that are justified either as protection against the dangers in the cities, the workload left behind for their mothers and the problems caused by the pregnancy of returning women that are already espoused to some relative to strengthen the ties between the families.

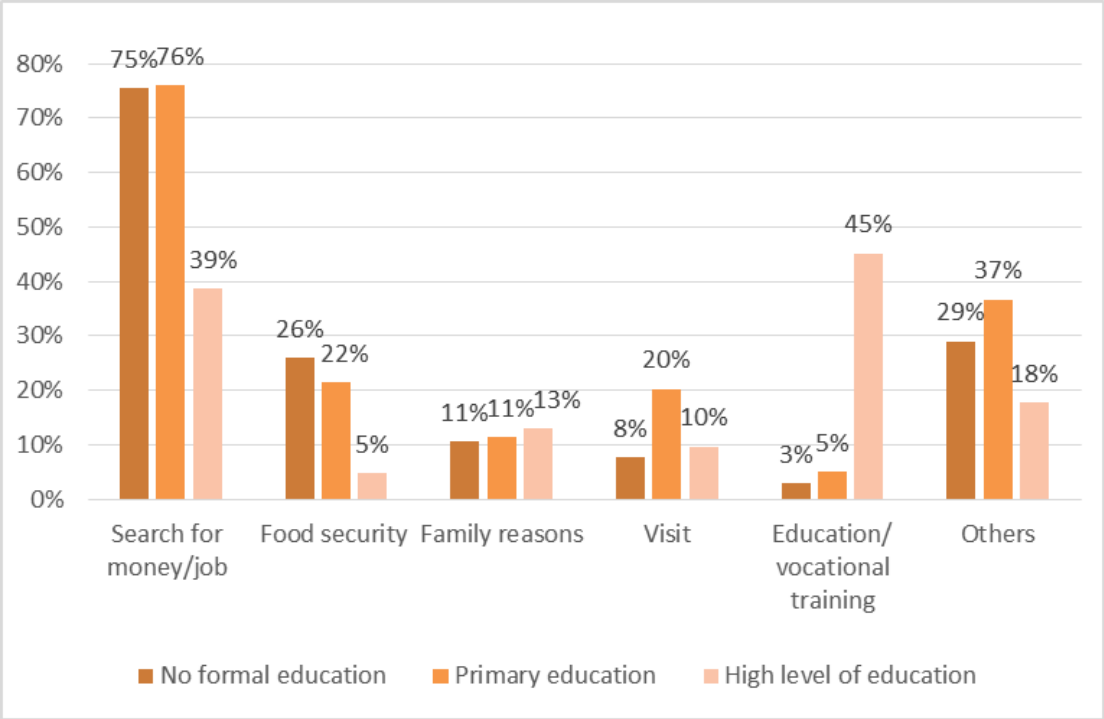
Migration motives by the level of education

The quantitative and qualitative results illustrate that migration motives differ between the level of education and gender.

Different levels of education are most significant in connection with the two migration motives ‘search for money/job opportunities’ ($p < 0.001$) and ‘education/vocational training’ ($p < 0.001$) for the survey participant’s initial and last migration.

While 61% of the survey participants with a high level of education indicate ‘education and/or vocational training’ as one of their main objectives for initial migration, this applies only to 9% participants with no formal education or just a primary education. Most respondents with no formal education or only primary education (each 64%) give ‘search for money/job opportunities’ as one of their main objectives for initial migration, while the more highly educated expressed far less agreement with this motive (17%). Since scholars, particularly for secondary education, often have to move to bigger villages or cities to attend classes, this results are not very surprising. More surprising is that the differences between the migration motives and the level of education also apply for people’s last migration (see Figure 3). While 45% of survey participants with a high level of education state ‘education and/or vocational training’ as one of their main objectives for last migration, it plays only a minor role for those with no formal education or just a primary education. The ‘search for money and job opportunities’ is an important motive for the last migration of survey participants but plays a bigger role for participants with no formal education or just primary education.

Figure 3: Main motives behind people's last migration depending on their education level



The qualitative interviews illustrate that migration is an important livelihood strategy in the study areas to diversify income and to reduce the household's vulnerability to environmental stress by compensating bad harvests with remittances as the following statement of a 60-year-old man from Senegal illustrates:

Every family is divided in two groups: one group stays in the village for farming (…) and one group migrates to the cities to work and support the family. If the yields are not good, those in the cities are obliged to support the family by sending money to the village.

However, according to the survey results this seems to apply predominantly to people with no formal or just primary education who give the search for job or money-earning opportunities as the main objective of their first and last migration.

Our findings reveal that migration independently from the migration motive can be one of several coping strategies to compensate for climate variability and environmental changes. The survey results illustrate that with an increasing level of education, people more often confirm that their families compensate for a bad harvest or bad conditions for livestock breeding by increasing money transfers from family members in migration (high education: 70% versus 47% for participants with no formal education) ($p < 0.001$). Well-educated respondents seem to be from a family that are in a better position to receive an increase in money transfers from migrants than families of people with no formal or just a primary education. Another strategy is to increase the number of migrants in the family; this is reported slightly more frequently by participants with primary-level education or no formal education than by the better educated (29% and 36% versus 19%) ($p < 0.05$). We found no significant relationship between the level of education and other coping strategies such as borrowing money from someone or taking out a bank loan, selling livestock, or engaging in small-scale business.

The qualitative interviews illustrate that, particularly in the past but also today, young people refuse to go to school, or leave school earlier to migrate in search for a job to support their

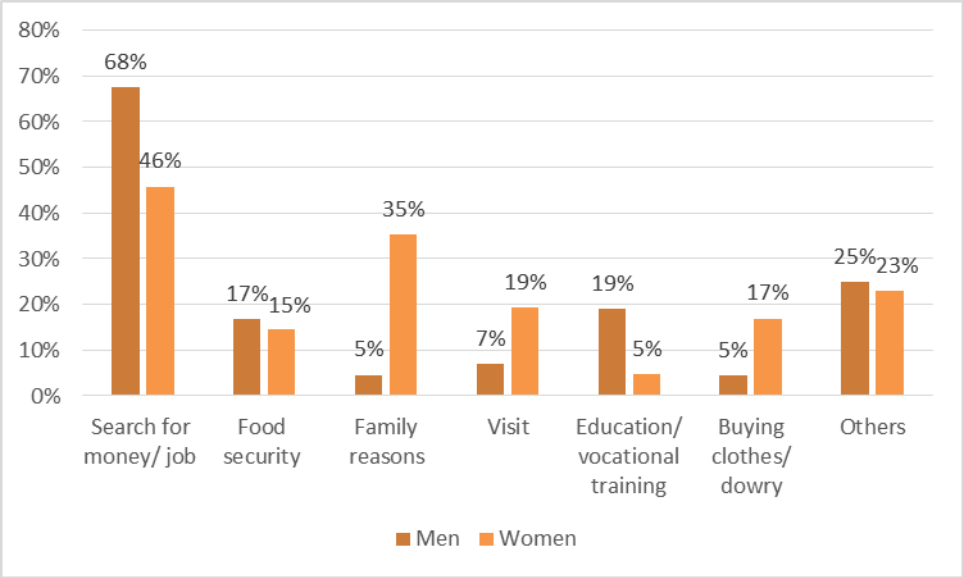
families by sending money, food or other goods. This is in line with the literature that reports migration as a constraint for education in the case of low-skilled migration (de Haas 2008) and for girls (Fentiman et al. 1999). However, the qualitative interviews indicate that migration patterns among the young people change with improved opportunities for schooling: in some villages today, fewer young people are leaving in search of job opportunities than in the past because they attend school more often and for a longer period instead. This is confirmed by the following quote from a 22-year old woman in Mali:

If you have no education, if you do not go to school and you do nothing, you have to leave to search for money, like I did.

Migration motives by gender

The 'search for money and job opportunities' it the main migration motive for both, men and women, although the percentage is lower for women compared to men (46% versus 67% for the first migration and 52% versus 80% for the last migration). However, women mention other main migration motives, like 'family reasons' (36% versus 5% for the first and 29% versus 3% for the last migration) and visits (19% versus 7% for the first and 17% versus 7% for the last migration) that are hardly mentioned by men. Migration for family reasons includes the tradition that women move to their husband's family after marriage (see Figure 4). Female survey participants barely mention 'education or vocational training' as a motive for their first migration (5% versus 19% of men) and last migration (10% versus 3%), which might be explained by their lower education level.

Figure 4: Migration motives of men and women for the first migration



Although both, male and female respondents indicate the 'search for money/ job' as a main motive of migration, the inquiry for further motives of migration suggests that this motive implies different meanings for men and women.

Food security as a motive behind 'search for money/job' is more important for men as for women (57% versus 34%), while female respondents rather confirm trousseau (35%) or buying clothes (37%) as further motives of migration in search for money and job opportunities. Buying clothes however, is also a further motive of 'search for money/job' for 20% of the male respondents.

The analysis of the qualitative interviews confirms the differences between men and women with respect to the motives of migration and is summarised in the following statement of a 44-year old men from the Senegalese study area:

Men take care of the food; everything that the women earn is for them. They return with clothes and jewellery, but it's all for them.

Although both men and women indicate 'the search for money/ job opportunities' or the "lack of means" as main migration motives, women specify that the search for money comprises the aim to prepare the wedding and to be able to afford kitchen equipment as well as fashionable clothing and jewellery. For men, on the contrary, 'the search for money/ job opportunities' in seasonal or temporary migration refers to economic security and investment. Due to the lack of agricultural work and employment opportunities during the dry season, migration can constitute an obligation for young men – not only due to the lack of financial means but also due to social expectations - to support their families with money and staple food. Thus, men usually migrate even if the yields have been satisfying in order to increase financial funds to build or maintain houses or to buy agriculture equipment, livestock or other goods such as motorcycles, clothes or mobile phones.

Adaptation strategy or aspirations to a better life?

The results from the quantitative and qualitative data indicate that many young people do not see their future in agriculture. This might be linked to a higher schooling attendance but also to increasingly unfavourable conditions for agriculture and decreasing and more and more uncertain yields due to highly variable or scarce rainfall and decreasing soil fertility. Young people instead migrate to the cities to become involved in business and other income-generating activities that promise a higher economic outcome and a better life. This is illustrated by the statements from two 34-year-old men from the Senegalese study area:

I tell you the truth, when I was still here [in the village, authors], I did not want to do farming. Not only because it is hard work, but because the yields are not good.

Young people who really want to make something of their future have to leave the village to do something other than farming because farming no longer allows you to live well.

An important aspect related to the migration of both men and women is the improvement of social standing and prestige within the community as a consequence of migration and the related remittances (see also Lo 2008). The analysis of the qualitative data and the participant observation illustrate that migration of men and women creates social inequalities within one community between those with and without migration experience. Success stories of former migrants that bring money, fashionable clothing and other consumer goods to the village not only have a considerable impact on social inequalities within the community, but also result in Massey et al. (1998) call chain migration, the further migration of other community members.

The strongest social inequalities of households within one community are usually generated by the remittances of international migrants. Cecillia Tacoli (2011a:17) states in her study on migrants that "no form of migration in Senegal is more pervasive than international migration to Europe". Particularly in Senegal, many young men aspire to succeed in life and to facilitating a better life for themselves and their families which in the belief of many can be easiest realized by migrating to Europe or to the USA. The qualitative interviews show that international migration outside the African continent seems to be out of reach for the Malian interviewees, but might still be desirable to some young men in the Senegalese study area. However, the imagination of a better life through international migration is relativized by stories of failed migration, awareness campaigns about the risks and costs of illegal migration

as well as a strong discouragement from those who 'succeeded' to arrive in the "economic El Dorado of Western Europe" (Lo 2008: 414).

Social inequalities generated by migration can result in social pressure on young people to achieve at least a similar economic status for themselves and their families to others and increase their aspirations to consumer goods and/or a better life. In Senegal, women report for instance that migration among girls "c'est la mode" and that other girls desire to migrate as well to afford the same fashionable clothes and jewellery as the returnees do. The following citation of a 29-year-old Malian women illustrates the social pressure among peer groups resulting from migration:

If you do not have migration experience at the age of 16, the other girls mock you when they return. That's why almost everybody leaves from the age of 14 years on.

The qualitative interviews reveal that today migration intends not only to fulfill the family's basic needs, but also to be able to satisfy higher expectations and aspirations and to invest in a better future for themselves and their families. Most interviewees consider migration as positive and not only an option to secure the families well-being but also as something that opens up possibilities of discovering and learning new things and to succeed in life even without a good education.

Even if it is difficult, I – I said to myself, I am interested in – I want to become somebody, I want to satisfy the needs of my family and my own needs. (…) I, my goal was to achieve something and that is easier in Europe. (34, m, Senegal)

Migration areas affected by environmental deterioration thus goes beyond being an adaptation strategy to environmental changes and is often related to aspirations to a better life.

Conclusion

This paper examined the role of gender and formal education as two dimensions of social vulnerability in environmentally induced migration. We use the example of two Sahelian regions in Mali and Senegal, were most people rely heavily on agriculture as their main economic activity. They are thus considered as highly vulnerable to decreasing soil fertility and decreasing and highly variable rainfalls that lead to decreasing and unreliable yields. The results show that people with a high level of education are less dependent on environment-sensitive economic activities and are thus less vulnerable to environmental stress.

Surprisingly, the education level has no significant impact on the migration experience as such, while a slightly lower percentage of women had own migration experience compared to the male respondents. However, motives for migration differ clearly depending on people's level of education and among men and women.

Migration constitutes an important part of people's livelihood in the study areas as alternative source of income during the dry season in which the workload in farming is relatively low. The results suggests that labour migration appears to be an adaptation strategy to environmental changes mainly for people with no formal education or primary education, while the better educated primarily migrate for education or vocational training. With regard to gender, money earning to secure their families livelihood and to invest in development or consumer goods plays an important role for migration for men, while women rather migrate to earn their trousseau or to afford new "trendy" clothing.

However, not only migration motives but also social expectations and capabilities differ among men and women. While young men are often expected to migrate even in case of satisfying yields to earn money to invest and to secure the family's livelihood in worse years,

migration of women, on the contrary, is not socially accepted or even prohibited in some villages in the Malian study area.

In summary, migration in the two study areas can be regarded as adaptation strategy to environmental changes for some people but often goes beyond the fulfillment of basic needs and food security. The tendency for a higher level of education and a lower involvement in agriculture as the main economic activity suggests that migration often constitutes a possibility for young people for personal success related to an increasing social standing on the one hand and to facilitate the development for the families and communities on the other hand.

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