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Research Article

Determinants of rural out-migration in Ethiopia: Who stays and who goes?

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Contents

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Determinants of rural out-migration in Ethiopia: Who stays and who goes?

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Abstract

BACKGROUND
Rural out-migration is a common phenomenon in Ethiopia. Several studies explain migration as the outcome of an individual utility-maximizing decision. This perspective ignores the diversity of migration types and inadequately explains migration in the wider context of mutual and interdependent risk-sharing strategies of household members in response to locational advantages and disadvantages.

OBJECTIVE
The main objective of this study is to examine households' choice of short-term and long-term migration and its underlying determinants in different locational contexts.

METHODS
Based on the household-centred New Economics Labour Migration (NELM) framework, we conducted quasi-longitudinal and context-specific structured interviews with 553 randomly selected households in four rural study sites in north-west Ethiopia. The determinants of household migration decisions on the one hand and the variables explaining decisions for short-term and long-term migration were analysed in a binary logistic regression and a multinomial logistic regression.

RESULTS
The results show a positive relation between migration decisions and household variables such as a higher education status, perceived food insufficiency, female household heads, household-head age, household size, and number of economic activities. Beyond the NELM framework, location in different livelihood zones is also significant in diverging migration strategies. Short-term migration is very much driven by locational advantages and food insufficiency. The propensity for long-term

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migration significantly increases for households with a higher educational level, but declines with a rising number of dependent household members.

CONTRIBUTION

We contribute to the discussion of ambiguous determinants of migration and provide more differentiated insight into short-term and long-term migration decisions. Besides strong support for the NELM framework, we highlight the relevance of education for long-term migration and locational meso-level factors for short-term migration.

1. Lack of knowledge on migration in rural Ethiopia

Migration is a complex, multicausal, and nonlinear demographic phenomenon that has occurred throughout human history at a variety of scales and touches the lives of many people in sub-Saharan Africa (Adepoju 2008; Malmberg 2008; Naude 2010; de Brauw, Mueller, and Lee 2014). Empirical findings for Ethiopia indicate that large-scale out-migration can be triggered by natural population increase and insufficient access to food (Ezra and Kiros 2001), overall destitution of households (Gebru and Beyene 2012), inadequate income and limited access to farm land (Bezu and Holden 2014), ecological degradation and drought (Berhanu and White 2000; Ezra 2001; Mberu 2006; Gray and Mueller 2012), government resettlement policies (Belay 2004; Hammond 2008), and employment opportunities elsewhere (Kassie et al. 2008).

Approximately 84% of Ethiopia's population lives in rural areas (CSA 2010) and largely depends on agricultural activity for both income and subsistence (Gray and Mueller 2012; Bezu and Holden 2014). Due to population pressure and the country's land tenure system, the livelihood of Ethiopia's rural population is particularly endangered by declining per-capita farm land (Rahmato 2004; Bezu and Holden 2014). As state authorities allocate land use rights, land is subject to neither sale nor long-term lease contracts.

If the rightholders leave the village for an extended period, their land use rights can be redistributed to the landless (FDRE 2005). The associated land right insecurity discourages landholders from out-migration (Rahmato 2004; de Brauw and Mueller 2012). By contrast, others argue that Ethiopia's land use policy also triggers the out-migration of rural landless youth (Ezra and Kiros 2001; Bezu and Holden 2014). Migration allows rural households to diversify their income sources and to overcome livelihood risks and lack of credit, land, and insurance (Taylor and Martin 2001; Ellis 2003).

Rural out-migration is a common phenomenon in Ethiopia and has become a concern of development planners, researchers, and policymakers. However, due to the

lack of an effective registration system, the quantitative levels of migration in Ethiopia are still unclear (Hailemariam and Adugna 2011). Moreover, there is much uncertainty regarding the determinants shaping the patterns, levels, and choices of rural migration, such as the decision for short-term versus long-term migration.

To bridge these gaps, we examine the determinants of rural migration decisions in general and the choice of short-term versus long-term migration in particular for the rural context of north-west Ethiopia. As in other parts of the country, households' migration strategies in the Amhara region are very heterogeneous with respect to duration and destination. Therefore, we consider the study site as representative of other rural areas in Ethiopia regarding the determinants of household migration decisions. However, when it comes to the proportion of migrant-sending households or the share of short-term and long-term migrants, misleading generalisations should be avoided.

2. Challenges of migration studies

Due to people's complex, context-specific, and diverse migration experiences, there is no universal definition, comprehensive migration theory, or common conceptual framework that serves as a starting point for empirical research (King 2002, 2012; Castles 2010). Consequently, the literature emphasises the role of an interdisciplinary and context-sensitive approach in empirical migration studies (see Abreu 2012; King 2012; Brettell and Hollifield 2015). Despite the complexity and context-specificity of migration decisions, we – like other scholars (Mckenzie and Rapoport 2007; Mckenzie and Sasin 2007; Sabates-Wheeler, Sabates, and Castaldo 2008) – assume that migration is no random process, but rather a choice that is influenced by a range of observable and unobservable factors that distinguish migrants from non-migrants.

Empirical migration studies are challenged by the endogeneity problem that may be created by self-selection, omitted variables, and reverse causality (Mckenzie and Sasin 2007; Sabates-Wheeler, Sabates, and Castaldo 2008).

Reverse causality (Mckenzie and Rapoport 2007; Mckenzie and Sasin 2007; Sabates-Wheeler, Sabates, and Castaldo 2008) refers to the overlapping nature of the determinants and effects of migration decisions in situations where migrants maintain ties with their area of origin in various forms, including remittances. The economic status of a household and other migration determinants that might cause migration decisions are subsequently shaped by the migration itself (Taylor 1999; Sabates-Wheeler, Sabates, and Castaldo 2008; De Haas 2010). Therefore, a simple comparison of migrants and non-migrants using cross-sectional data is often assessed as an inadequate technique to understand the nature of these interlinked determinants and

effects (Taylor 1999; Mckenzie and Sasin 2007; Sabates-Wheeler, Sabates, and Castaldo 2008).

In our study we address the endogeneity problem with a retrospective questionnaire that supports the collection of data at two points in time, i.e., the status of households in 2014, and the year in which migration occurred for migrant-sending households or ten years before (2004) for non-migrant-sending households. The ten-years reference period for non-migrant-sending households was the outcome of an exploratory analysis in the study location (see next section) that found that the vast majority of migrant-sending households had sent their migrants within the last ten years (this was later confirmed by the sample data, see section 5.2).

In Ethiopia, as in other sub-Saharan countries (de Brauw, Mueller, and Lee 2014), empirical migration studies are confronted with a profound lack of data. The national census is limited to questions focusing on place of birth, previous place of residence, and duration of current residence (see CSA 2006, 2010), which does not allow the examination of migration rates, determinants of migration, or implications for migration (de Brauw, Mueller, and Lee 2014).

While a growing number of studies investigate international migration, for Ethiopia the knowledge gap is particularly profound when it comes to determinants of intranational migration. Therefore, our study focuses on context-specific research at the lower administrative level, in our case the *kebele*, taking into account both inter- and intranational migration.

3. Conceptual framework and exploratory analysis

Efforts to explain migration can be categorised into individual and household approaches (Tsegai 2007). In the first category the neoclassical microeconomic model (see Todaro 1969; Harris and Todaro 1970; Todaro and Smith 2006) has been criticised for its limited capacity to adequately understand the diversity of migration types and for the oversimplification of migration as an individual utility-maximizing decision (Taylor 1999; De Haas 2010; King 2012). The expectancy value theory (Fishbein and Ajzen 1975) and the theory of planned behaviour (Ajzen 1988) provide more pluralistic perspectives on individual migration decisions and include contextual factors. According to these two interlinked theories, migration behaviour is the outcome of a goal-oriented conscious decision based on an individual's evaluation of alternative locations in relation to expectations, values, norms, and – in the case of the theory of planned behaviour – perceived behavioural control (for application with longitudinal migration data see De Jong 2000; Kley 2011).

Shifting the focus away from individuals, the New Economics of Labour Migration (NELM) model (Stark and Bloom 1985; Stark 1991) and the Sustainable Livelihoods Approach (Ellis 2000, 2003) focus on household decisions. Both approaches conceptualize migration in the wider context of household members' mutual and interdependent risk-sharing strategies (Stark and Bloom 1985; Stark 1991). The Sustainable Livelihoods Approach perceives migration as one of several livelihood strategies of households to fulfil their subsistence need in response to risks and constraining conditions (Ellis 2000, 2003).

The individual- and household-focused theories described are complementary in explaining the heterogeneity of migration determinants in a variety of micro-level contexts interacting with macro-level policy influence (King 2012). Due to the complexity and context-specific nature of migration patterns and the associated lack of a comprehensive migration theory (Castles 2010; King 2012), we grounded our study with an exploratory research phase in the Ethiopian study sites. Following Knafl and Howard (1984), the qualitative results from this explorative study should help to select an appropriate theoretical framework and to contextualize the literature-based hypotheses and response categories.

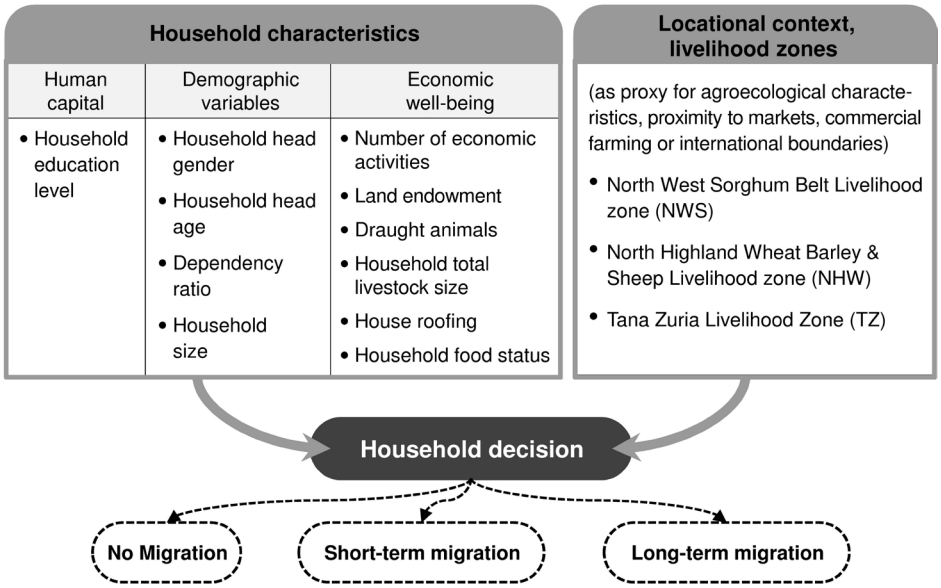
We organized an inter- and transdisciplinary workshop (King 2002, 2012; Brettell and Hollifield 2015) with Ethiopian demographic and development experts and local community representatives. Kebele leaders and development agents together with the application of the snowball technique helped to identify return migrants, heads of migrant-sending households, and persons who had seasonal migration experience, for exploratory interviews. Eighteen explorative interviews and four focus group discussions (in April and May 2014) helped to understand why and how locals migrate and who decides the issue.

According to the exploratory results, migration decisions are usually part of a mutual agreement between the migrant and other household family members. In the Ethiopian context, households are the suitable unit of analysis as they control the assets and ensure the future of the family (de Haan and Yaqub 2009). Therefore, we opted for the NELM framework, which places migration behaviour in the wider societal context of household decisions and concentrates straightforwardly on manifest household characteristics and migration (Taylor and Martin 2001; Hagen-Zaker 2008; De Haas 2010). NELM also takes into account complex, often indirect ways of how migration and remittances influence the economic status of households (De Haas 2010). Thus, it addresses both determinants and impacts of migration strategies (Taylor and Martin 2001; Hagen-Zaker 2008).

Figure 1 shows the analytic framework and the household variables that we derived from the literature based on the NELM framework. We distinguish two categories of migration: short-term migration (migrants who left for more than one but

less than twelve months) and long-term migration (migrants who left for more than twelve months).

Figure 1: Conceptual framework (adopted from Bilsborrow 2002)



The NELM framework does not establish any explicit connection between household migration decisions and locational factors, which were identified as a relevant explanatory variable in the explorative study phase. Comparative locational (dis-) advantages have been considered by empirical application of the expectancy value theory and/or the theory of planned behaviour (De Jong 2000; Kley 2011) and in previous studies conducted in Ethiopia and elsewhere (see Taylor 1999; Ezra and Kiros 2001; Bilsborrow 2002; Olowa and Awoyemi 2012).

Figure 1 shows that we used livelihood zones[3] (as defined in a joint project of USAID and the Ethiopian Government in 2007) as a proxy for location characteristics such as market access and agroecology. These features differ from study site to study site, despite the same national policies or international influences. Table 1 presents the

[3] Livelihood zones are areas where people share similar livelihood patterns (influenced by local agroecology, crop types, production systems, and access to the market) (USAID and Government of Ethiopia 2007).

variable definitions and units of measurement and their assumed relation to migration (positive, negative, or ambiguous, according to the literature, see sections 7.2 and 7.3).

Table 1: Definition and measurement of variables for the logit model

Dependent variable	**Description and measurement**	
Y_1	Household dummy, 1 if household has at least one migrant	
Y_2	Household dummy, 1 at least one short-term migrant (no long-term migrant), 2 at least one long-term migrant (no short-term migrant)	
Explanatory variable	**Description and measurement**	**Assumed relation with migration (literature-based)**
Household head gender	Dummy variable (male is reference)	+
Household head age	Continuous variable measured in completed years at the time of the interview	+
Dependency ratio	Continuous variable measured as ratio of the dependent (age groups 0–9 and >65) divided by the number of household members of working age (10–64, including migrants)[1] at the time of the interview	+/–
Household size	Continuous variable measured as the number of household members (including migrants) at the time of the interview	+
Number of household economic activities	Continuous variable measured as the total number of economic activities of household members prior to the first migration/in 2004 for nonmigrant households	+/–
Land endowment	Land owned by household members prior to the first migration/in 2004 measured as categorical variable: 0 for household with less than 1 hectare (poor); 1 for household with 1 ha or more (better-off; taken as reference)	+/–
Draught animals	Household-owned draught animals[2] measured as categorical variables: 0 for households with no draught animal, 1 with one, and 2 with at least two (reference) draught animals prior to the first migration/in 2004	–
Household's livestock size (TLU)	Total livestock size owned by the household prior to the first migration/in 2004, measured by the continuous standardised animal Tropical Livestock Unit[3]	–
House roofing	Dummy variable coded as 1 (reference category) if the household had a corrugated iron roof prior to the first migration/in 2004	+

Table 1: (Continued)

Explanatory variable	Description and measurement	Assumed relation with migration (literature-based)
Household food status	Dummy variable coded as 1 (reference category) if interviewees perceived the household's food status as sufficient prior to first migration/in 2004	+
Household education level	The educational level of the most highly educated person in the household (including migrants) categorized as no or only primary education (0, reference), secondary & above (1)	+
Livelihood zone	3 livelihood zones: NHWB (reference category), NWS, and TZ	?

Source: NELM literature-based assumption; "?" indicates unknown relationship as local context is outside of the NELM scope.
[1] Usually calculated as ratio of the net economical dependents (those aged 0–14 and those aged 65+ years) to net economical independents (15–64 years). However, in a country like Ethiopia with low life expectancy and common child labour, this standard method would not reflect reality. Based on the exploratory analysis, we defined the dependent young cohort as the age group from 0–9.
[2] Households with two or more draught animals can independently plough their farm plots, while households with only one draught animal plough their plots by pairing with animals from their neighbours, and households with no draught animal plough by exchange of labour or fodder for the animals or by sharecropping.
[3] A Tropical Livestock Unit (TLU) is a standardized animal unit equivalent to a live weight of 250 kilograms: one ox = 1.1 TLU, one cow = 0.8 TLU, one bull = 0.6 TLU, one heifer = 0.5 TLU, one calf = 0.2 TLU, one horse/donkey/mule = 0.36 TLU, one sheep/goat = 0.1 TLU, and one chicken = 0.01 TLU (FAO 2003). There is an overlap between TLU and draught animal, but TLU is the most available form of physical asset, which may also compensate credit and saving imperfections in rural Ethiopia.

4. Methodology

4.1 Study sites and sampling

The study was conducted in four rural kebeles in north-west Ethiopia: Adisge-Miligebsa, Woken zuria, Nara-Awdarda, and Walideba, selected from three different *woredas* (districts): Debark, Dabat, and the last two from Chilga woreda, respectively. Each study site comprises almost 15% of the woreda's population (CSA 2010). There are multiple reasons behind the purposive selection of the study sites. The first three kebeles are part of a larger interdisciplinary project, involving three universities and one research institute. We added a fourth kebele, Walideba, to have a third livelihood zone (see Table 1) for the analysis of the local context's influence on migration decisions in general and short-term versus long-term migration choices in particular. Compared to the other study sites, the kebele Adisge-Miligebsa is particularly remote from infrastructure, hampered by ragged mountain terrain, and partly located inside the Semen Mountain National Park. Waledeba and Nara-Awdarda are located along the Gondar-Metema highway, while the kebele Woken zuria is situated adjacent to the

Gondar-Debark road but is still very far away from job opportunities. All the study areas are characterised by mixed crop-livestock production and are governed within the same Ethiopian policy framework, and the inhabitants speak the same language.

The study kebeles comprise 29 sub-kebeles (see Table 2). Time, financial, and logistical constraints called for a purposeful selection of twelve sub-kebeles, proportional to the total number of sub-kebeles and covering a variety of distances to the nearest road. The health posts of each kebele provided household lists. Five hundred and fifty-three households were randomly selected; they represent 11% of all households in each of the four kebeles (see Table 2). Nine deserted households, i.e., rare cases of out-migration of the entire household, were substituted by the nearest household, as no one was left to provide information.

Table 2: Study sites and sampling

Study woreda	Study kebele	Number of households	Total population	Number of sub-kebeles	Sampled sub-kebeles	Sampled households	Livelihood zones
Debark	Adisge-Miligebsa	1,393[1]	7,488[2]	5	2	154	NHWB
Dabat	Woken zuria	1,603[1]	8,501[2]	7	3	177	NHWB
Chilga	Walideba	665[1]	2,982[2]	5	2	75	NWS
Chilga	Nara-Awdarda	1,328[1]	6,842[2]	12	5	147	TZ
Total		4,989	25,813	29	12	553	

Sources: [1] unpublished data obtained from the Kebele Community-Based Health Information System (2014); [2] unpublished data obtained from the CSA (2007)

4.2 Method of data collection

After the literature review and explorative analysis (section 3), a questionnaire was drafted and translated to the local language, Amharic. A pretest with 40 households helped to test the understandability of the questionnaire and to check if the answer categories were complete and did not overlap. Atsede Desta Tegegne, supported by seven research assistants, carried out the interviews in August and September 2014. Data collectors had been intensively trained regarding the concept behind each question and data gathering techniques. Once households were selected, we asked the household heads (if not available their spouses) to answer the questions.

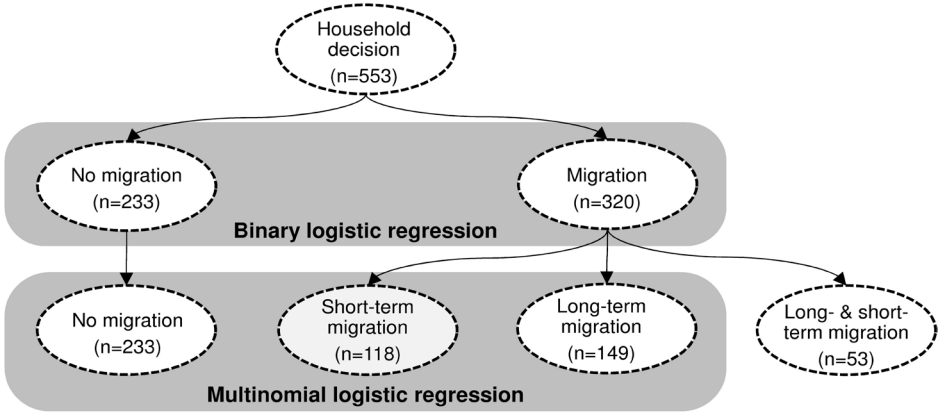
To minimize potential sources of endogeneity problems (section 2), some data was collected for the situation prior to the first migration or for 2004, for migrant and

nonmigrant households respectively (see Table 1). Retrospective interviews about past household characteristics are not free from recall bias. During data collection, interviewers supported interviewees to contemplate and reconstruct the past household status. In line with Easterlin (2001) we started with questions on the current situation before posing the same question about the past. Furthermore, to overcome recall bias, retrospective questions focused on households' 'objective' living conditions, which are most likely to be affected by the migration itself; for example, draught animal ownership, land-holding size, house roofing, and number of economic activities. If households had sent more than one migrant, we defined the temporal reference point as prior to the departure of the first migrant in order to overcome subsequent migration impacts on the selected variables.

4.3 Methods of data analysis

In line with the objectives of the study, we describe the proportions of short-term and long-term migration with descriptive statistics. To analyse the migration determinants, we considered multilevel, nested, and different combinations of binary and multinomial logit models. A multilevel model would have been very helpful to better understand the interaction between the higher-level locational neighbourhood and lower household-level effects. However, with three livelihood zones, we did not have enough neighbourhoods for such an analysis (Kreft and De Leeuw 1998; Maas and Hox 2005). A nested analysis of all groups, illustrated in Figure 2 in one single model, would not allow the inclusion of 53 households with both short-term and long-term migrants (empty cells). Regarding the explanatory variables and coefficients, the outcomes of the multinomial (no, short-term, or long-term migration) and two binary models (no migration versus migration; short-term versus long-term migration) were consistent. Compared to the binary regressions, and taking sample size into account, the multinomial logit had less unexplained variability (indicated by log-likelihood, model chi-square, and R statistics). These statistics show how well the model fits the observed data and highlight the added explorative value of differentiating between short-term and long-term migration (see Table 5).

Figure 2: The two logistic regression models



We opted for a combined presentation of binary and multinomial logit models, as these two models best describe the data, allow for the inclusion of all cases, and use the same reference category of 'no migration' (see Figure 2). The binary logit model looks into the variables influencing the sample households' probability of sending at least one migrant, short-term, long-term, or both (see Table 5). After excluding 53 households with both short-term and long-term migrants, we scrutinized the data of 500 households in a multinomial analysis regarding their decisions for no migration, short-term migration, or long-term migration.

Before the regression analyses the data was crosschecked to ensure that all expected frequencies in each cell of a cross-tabulation table were greater than 1 and that no more than 20% were less than 5. Multicollinearity was checked based on variance inflation factors and tolerance values. In our sample we did not find any long-term migrant-sending household with no formal education. To avoid a quasi-complete separation problem due to zero cell counts, we combined the answer categories of 'no formal education' and 'primary education.'

5. Characteristics of the sampled households and migrants

5.1. Comparison of the sample with rural Ethiopia and the Amhara region

Orthodox Christianity is the dominant religious affiliation of almost all households (98%) in the sample, which is close to the 2007 national census result for the rural North Gondar zone (95%), but differs from the share of Orthodox Christians in the rural

Amhara region (83%) and nationwide (44%). Due to the small number of questionnaires filled in by other religious groups (expected count below 5%, section 4.3), we were not able to analyse possible statistical relations between religion and migration decisions.

The average household size of our sampled population is 6.6 persons, which is above the average of 5.1 in rural Ethiopia (CSA 2012). This can be partly explained by the inclusion of long-term migrants in our definition of household size, who are excluded from the national census household member defintion. On average, our sample households send 1.1 migrants. The corrected sample's household size (5.5), however, is still slightly above the national rural average (5.1).

The majority of the sampled households (86%) are currently headed by males, which is above the male proportion for rural Ethiopia of 78% (CSA 2012). The share of households covered by corrugated iron sheeting (as an indicator of housing quality and economic wellbeing) is similar to the overall situation in rural areas (34% in the sample versus 39% in the rural Amhara region and 26 % in rural Ethiopia; see CSA 2010).

To analyse the educational characteristics of households across the study sites, we asked respondents about the household head's education and the highest educational level of household members, including the migrants before departure. In rural Ethiopia the percentage of household heads who completed primary education (up to grade 6) was 11% in 2010/11 and below 5 % in 2004/05 (CSA 2012). Similarly, only 8% of the sampled household heads had formal education.

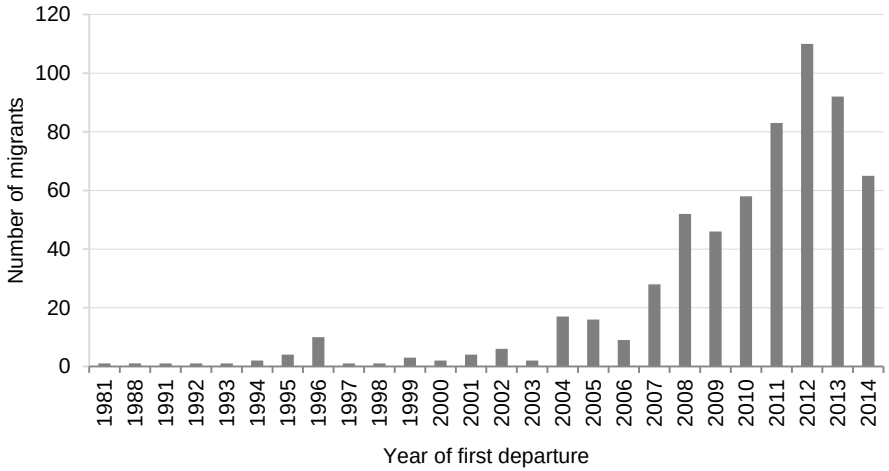
The average farm size in our sample is 0.99 hectares, which is almost the same as that in the national land use survey, 0.95 hectares (CSA 2014). More than half of the sampled households (53%) hold less than one hectare of farm land (Amhara region 50%, nationwide 59%) (CSA 2014). We assume that the sample is representative of rural Ethiopia regarding education, farmland endowment, and the housing quality indicator 'iron roof.' However, compared to other rural areas in Ethiopia, the sample is characterised by a much higher share of Orthodox Christians and slightly bigger household sizes.

5.2 Characteristics of the migrants

In the data set, the households are home to 3,055 permanent residents and 616 migrants (i.e., an average of 1.1 migrants per household). 58% of the total of 553 households has at least one migrant member. Half of the migrant-sending households have more than one migrant and about 33% of them accommodate both short-term and long-term migrants. 93% of the migrants first left in 2004 or later (see Figure 3), which confirms our choice of reference period for nonmigrant sending households (section 2). 61% of

household interviewees stated that migration decisions were made by the family, which confirms the choice of the NELM framework (section 3).

Figure 3: Distribution of the 616 migrants by year of first departure



Source: household interviews carried out in 2014

Table 3 shows the distribution of household's migration status across the study sites. 18% of the 202 long-term migrant households sent their migrants abroad, mostly to Sudan and Middle East countries. The majority of international migrants are found in the sample of Adisge-Miligebsa, and none in the kebele Waledeba.

Table 3: Migration status of households by study site

Study site / Migration status & type	All sites N=553	Adisge-Miligebsa N=154	Woken zuria N=177	Nara-Awdarda N=147	Waledeba N=75
Short-term migrants (N=118)	118	14	30	34	40
Long-term migrants (N=149)	149	52	55	38	4
Both migration types (N=53)	53	11	16	19	7
Migrant households	320	77	101	91	51
Non-migrant households	233	77	76	56	24

Source: household interview carried out in 2014

At the time of departure, 82% of the migrants were single and young (mean age about 20 years). 76.5% of them can be considered educated (completed primary or higher education before their departure). 60% of all migrants were male. Whereas females were predominantly (85%) involved in long-term migration, males predominated in farm-related jobs available in short-term migration destinations. Migration was motivated predominantly by economic reasons: landlessness or small land endowment (64%), unemployment (58%), and low agriculture productivity (33%) were the answer categories most often chosen by the interviewees (multiple answers possible).

Table 4 provides an overview of the dataset for the full sample and for the two subsamples of nonmigrant and migrant households. The t-test and Pearson's chi-square test, respectively, had already revealed statistically significant differences between migrant- and nonmigrant-sending households.

Table 4: Summary statistics for discrete and continuous variables included in the model

Variable	Overall (N=553, 100%)		Migrant households (N=320; 58%)		Nonmigrant households (N=233; 42%)		
	Min/Max	Mean(SD)	Min/Max	Mean(SD)	Min/Max	Mean(SD)	t-test
Household head age	20/90	50.14(13.65)	20/89	53.74(12.80)	25/90	45.20(13.23)	–7.648***
Dependency ratio	0/5	0.47(0.48)	0/3	0.36 (0.39)	0/5	0.62(0.55)	6.202***
Household size	1/14	6.64(2.40)	2/14	7.34 (2.39)	1/11	5.67(2.07)	–8.813***
Household livestock size (TLU[4])	0/33.18	5.79(5.16)	0/33.20	6.60 (5.55)	0/17.82	4.69(4.34)	–4.54***
Number of economic activities	1/10	4.39(1.83)	1/10	4.69 (1.75)	1/9	3.97(1.87)	–4.641***
Categorical variable	**%**		**%**		**%**		**chi-square test**
Household head gender (male)	86.1		83.1		90.1		0.019*
Household food status (sufficient)	65.3		59.7		73.0		0.001**
House roofing (ironsheet)	34.2		39.4		27.0		0.003**
Household educational level (no or primary education)	54.4		40.0		74.2		0.000***
Household land endowment (better-off: ≥ 1 ha)	46.8		54.7		36.1		0.000***

Table 4: (Continued)

Categorical variable	Overall (N=553, 100%)	Migrant households (N=320; 58%)	Nonmigrant households (N=233; 42%)	chi-square test
Household draught animal				
Two or more draught animals	61.3	65.6	55.4	0.012*
One draught animal	18.3	18.3	18.5	
No draught animal	20.4	16.2	26.2	
Livelihood zone				
NHWB	59.9	55.6	65.7	0.040*
TZ	26.6	28.4	24.0	
NWS	13.6	15.9	10.3	

Source: household interviews carried out in 2014; *** (p<0.001), ** (p<0.01) * (p<0.5)

6. Determinants of migration decisions

Table 5 presents the results of both the binomial (first column) and multinomial logistic regressions (second and third columns). Both have the same reference category of nonmigrant households.

6.1 Binary logistic regression explaining the propensity to migrate

Two hundred and thirty-three of all the households interviewed had not sent any migrants and 320 were homes of migrants (short-term and/or long-term). The first column of Table 5 provides an overview of the results of the binary logistic regression looking into the variables explaining the propensity of rural households to send members out of the village, independent of the duration.

The result with the highest B value (see Table 5) confirms the hypothesis of a positive influence of the households' perceived insufficient food status. The stated relative inability to feed the family compared to neighbouring households increased the sample households' propensity to send a migrant by four times (p=0.000). The location of the sampled households in different livelihood zones was also identified as a good predictor of migration decisions. The odds of a positive migration decision in households located in the North West Sorghum (NWS) livelihood zone (relatively close to commercial farming areas) are 3.3 times (p=0.001) higher compared to those located

in the North Highland Wheat & Barley (NHWB) livelihood zone, which is further away from commercial farming areas.

Household head's gender is another variable with an assumed positive relationship with migration decisions. Sample households headed by females were 3.3 times (p=0.001) more likely to send a migrant than those headed by males. Households that had family members with some or completed secondary education were 2.5 (p=0.000) times more likely to report a positive migration decision compared to those households with no or only primary education.

The literature review showed both positive and negative relations between dependency ratio and migration decision (Table 1 and section 7.3). In our logit model the dependency ratio significantly lowered the propensity of the sample households to send a migrant (see Table 5). An increase of one dependent (in the study sites, as generally in Ethiopia, this would very likely be an extra child, due to high fertility rates and low life expectancy) decreased the probability of the sample households' decision to send a migrant by 0.6 (p=0.024).

As expected, we see a positive – albeit small – relation between household size and the odds of sending a migrant. The increase by one family member raises the likelihood of a migration decision by 48% (p=0.000).

The logistic regression shows a significant positive relation between age of the household head and the odds of sending a migrant. In our sample a one-year expansion in the age of the household head increases the odds of sending a migrant by 6% and a ten-years age raise increases the odds by 81% (p=0.000).

We also asked interviewees about the total number of on-farm, off-farm, and non-farm activities listed in the questionnaire (with the option to add further activities). An additional economic activity stated by the interviewees increased the sample household's propensity to migrate by 20% (p=0.013).

Table 5: Likelihood estimates of the logit models for the determinants of rural out-migration (binary model) and short-term and long-term migration choices (multinomial model)

Explanatory variables	Migration decision											
	Binary regression (N=553, reference non-migrant households)				Multinomial regression (N=500, reference non-migrant households)							
	Migrant households (N=320) [a]				Households with short-term migrants (N=118) [b]				Households with long-term migrants (N=149) [b]			
	B (S.E.)	Exp(B) (Odds ratio)	95% confidence interval Lower	Upper	B (S.E.)	Exp(B) (Odds ratio)	95% confidence interval Lower	Upper	B (S.E.)	Exp(B) (Odds ratio)	95% confidence interval Lower	Upper
Household head age	.056 (.010)***	1.057	1.04	1.08	.037 (.012)**	1.037	1.01	1.06	.061 (.011)***	1.062	1.04	1.09
Household head (female)	1.183 (.346)**	3.265	1.7	6.43	.975 (.434)*	2.651	1.13	6.21	1.103 (.392)**	3.012	1.39	6.49
Household size	.390 (.060)***	1.477	1.31	1.67	.338 (.073)***	1.402	1.21	1.62	.316 (.068)***	1.372	1.20	1.57
Household dependency ratio	–.519 (.230)*	.595	.38	.934	–.337 (.294)	.714	.40	1.27	–.582 (.289)*	.559	.317	.985
Household education (secondary or above)	.913 (.250)***	2.491	1.53	4.07	.520 (.321)	1.682	.896	3.16	1.314 (.296)***	3.719	2.08	6.64
NWS	1.192 (.352)**	3.295	1.65	6.57	2.440 (.411)***	11.472	5.13	25.68	–1.149 (.616)	.317	.095	1.06
TZ livelihood zone	.491 (.298)	1.633	.910	2.93	1.308 (.385)**	3.69	1.74	7.857	–.223 (.356)	.800	.39	1.61

Table 5: (Continued)

Explanatory variables	Migration decision											
	Binary regression (N=553, reference non-migrant households)				Multinomial regression (N=500, reference non-migrant households)							
	Migrant households (N=320) [a]				Households with short-term migrants (N=118) [b]				Households with long-term migrants (N=149) [b]			
	B (S.E.)	Exp(B) (Odds ratio)	95% confidence interval Lower	Upper	B (S.E.)	Exp(B) (Odds ratio)	95% confidence interval Lower	Upper	B (S.E.)	Exp(B) (Odds ratio)	95% confidence interval Lower	Upper
Number of economic activities	.179 (.072)*	1.196	1.04	1.38	.192 (.090)*	1.21	1.06	1.446	.126 (.087)	1.135	.96	1.35
Household food status (insufficient)	1.383 (.276)***	3.986	2.32	6.84	1.746 (.345)***	5.732	2.92	11.3	1.239 (.322)***	3.453	1.84	6.49
House roofing (thatched)	–.359 (.233)	.698	.443	1.10	–.737 (.285)*	.48	.27	.837	–.203 (.270)	.817	.48	1.39
One draught animal	.037 (.317)	1.038	.56	1.93	.243 (.385)	1.28	.59	2.714	–.171 (.383)	.842	.39	1.79
No draught animal	.298 (.365)	1.347	.66	2.76	.202 (.466)	1.22	.49	3.052	.227 (.439)	1.254	.53	2.96
Poor land endowment (<1 ha)	.540 (.285)	1.716	.98	2.99	.660 (.360)	1.93	.96	3.915	.253 (.330)	1.287	.67	2.46
Livestock size (TLU)	.001 (.030)	1.001	.94	1.06	.004 (.038)	1.00	.93	1.082	.008 (.035)	1.008	.94	1.08
Constant	–6.952 (.922)	.001										

Reference category= non-migrant households (N=233)

*p<0.05, ** p<0.01, ***p<0.001

[a] Sample size=553; Model $x^2(14)$=217.401***; –2LL= 535.475; R^2=0.325 (Cox & Snell), R^2=0.437 (Nagelkerke)

[b] Sample size=500; Model $x^2(28)$=270.81***; –2LL=786.554; R^2=0.418 (Cox & Snell), R^2=0.476 (Nagelkerke)

6.2 Determinants explaining the propensity for short-term and long-term migration choices

In the multinomial logistic model (second and third columns in Table 5), we analysed 500 households (excluding 53 that had both short-term and long-term migrants), to understand why 118 of them opted for short-term and 149 for long-term migration. As expected from the binary regression, the multinomial regression shows that age of the household head, household size, household head's gender, and perceived food status of the household are identified as having a significant positive explanatory value for both short-term and long-term migration. However, we found that the likelihood of short-term migration is considerably higher in households with perceived food insufficiency (5.7 versus 3.5 times). The propensity for long-term migration is slightly higher in female-headed households (3.0 versus 2.7 times).

Sample households with some or completed secondary education were 3.7 times (p=0.000) more likely to send long-term migrants, whereas education seems to play no significant role in short-term migration decisions (Table 5). One has to keep in mind that we combined categories of education level, as our sample did not include any long-term migrant-sending household with no formal education, which highlights the relevance of education to long-term migration.

The negative relation between the dependency ratio and overall migration mainly refers to long-term migration. In the multinomial regression the dependency ratio significantly lowered the propensity of households to send a long-term migrant by 0.6 (p=0.044), but did not show any significant effect for short-term migration.

The relative locational advantage of households in NWS and TZ (Tana Zuria) livelihood zones, which represent better agricultural productivity and proximity to commercial farming areas, increased the propensity for short-term migration 11.5 (p=0.000) and 3.7 times (p=0.001) respectively. However, location showed no significant effect on long-term migration, despite the higher share of long-term migrants in the more mountainous NHWB reference zone, which includes the sub-samples of the kebeles Adisge-Miligebsa and Woken zuria in or near the mountainous Semen National Park (see Table 3).

In contrast to the insignificant relation between thatched roof and migration indicated by the binary regression, and in contrast to the literature, the multinomial regression indicates that sample households with a thatched roof (i.e., supposedly the economically poor) were 0.48 times (p=0.010) less likely to have one or several short-term migrants than those with an iron roof.

7. Discussion

7.1 Discussion of the research design

Our analysis is limited by its spatial scope and the number of interviewees. The sample can be considered to be structurally representative of rural Ethiopia regarding education, farmland endowment, and the housing quality indicator 'iron roof.' However, compared to other rural areas in Ethiopia, the sample is characterised by a much higher share of Orthodox Christians, a slightly higher share of male household heads and slightly bigger households. We consider the purposefully selected study site in the Amhara region as representative of other rural areas in Ethiopia regarding the determinants of household migration decisions. However, we caution against misleading generalisations when it comes to the proportion of migrant-sending households or the share of short-term and long-term migrants.

Another potential limitation of the research design is that households with migration returnees are considered as non-migrant households. Return migrants' past remittances might have distorted some of the data on economic well-being. However, we consider the risk of this potentially misleading effect to be very low, as exploratory findings showed that long-term migrants commonly are uninterested in returning to their rural village, and short-term migrants seem to be less willing to contribute to household expenditure but rather try to invest in their own land or enterprise.

The common challenge faced by empirical migration studies using cross-sectional data (e.g., for Ethiopia, Gebru and Beyene 2012) is the intrinsic endogeneity problem (see section 2), which might result in biased results and misleading decision support for migration-related policy choices (Mckenzie and Sasin 2007). To address this endogeneity challenge, we collected quasi-longitudinal data (two points in time) on explanatory variables that might be affected by the migration process itself (see Table 1). Being aware of potential recall bias, we supported interviewees in reconstructing the past household situation. Furthermore, we tried to understand context-specific migration strategies in explorative semi-structured interviews and focus group meetings. These qualitative insights hopefully helped us to contextualize our literature-based research hypotheses, questionnaire, and response categories and also supported the following discussion and interpretation of the quantitative results.

According to Mora and Taylor (2006) and Sabates-Wheeler, Sabates, and Castaldo (2008), migration is not only a choice influenced by a range of observable variables but is also determined by unobservable factors. Unobserved characteristics, such as individual skills, a spirit of adventure, or pull factors from destination areas, are not included in our logistic regression model and thus might account for some of the omitted variables bias (Mora and Taylor 2006; Mckenzie and Sasin 2007; Sabates-

Wheeler, Sabates, and Castaldo 2008). Overall, the first binary regression model correctly predicts 85.3% of households' decision to send a migrant (77.6% of both migrant- and non-migrant-sending cases). The multinomial model fit is good with p=0.502 Pearson and 1.000 deviance statistics, indicating that the model does not significantly differ from the observed data.

In the multinomial model, the B value of 2.44 shows a very strong positive relation between the accessibility of commercial farming areas (NWS livelihood zone) and short-term migration. A multilevel model would have been very helpful to better understand the interaction between higher-level neighbourhood and lower household-level effects. However, our study areas did not include enough neighbourhoods (livelihood zones) for such an analysis (Kreft and De Leeuw 1998; Maas and Hox 2005). A future nationwide migration study could, however, consider a multilevel model to better estimate this contextual effect.

Despite all its limitations, this study provides interesting new insights on short-term and long-term migration choices that contribute to ambiguous migration determinants (see section 7.3). However, first we discuss those results that confirm prior research.

7.2 Results confirming prior research

The results for the role of education, household head's gender and age, household size, and dependency ratio in migration decisions presented in section 6 are largely consistent with previous studies in Ethiopia and elsewhere and also with the explorative findings from the study sites. The very strong positive relation between formal secondary education and migration in general (the probability is two times higher) and long-term migration in particular (the probability is four times higher) confirms previous studies in rural Bangladesh, Ethiopia, Ghana, Haiti, Kenya, and Mexico (Chiquiar and Hanson 2005; Mora and Taylor 2006; Sindi and Kirimi 2006; Tsegai 2007; Mendola 2008; Hailemariam and Adugna 2011; Bezu and Holden 2014; Heckert 2015). The findings of transdisciplinary scenario research show that more highly educated household members – particularly from the kebeles Adisge-Miligebsa and Woken zuria – tend to leave rural areas in search of better options (Tegegne, Penker, and Wurzinger 2015). In contrast to its strong effect on long-term migration, our results highlight that education does not play a significant role in short-term migration.

Our finding that households headed by females recorded a 3.0 (2.7) times higher propensity to send long-term (short-term) migrants is consistent with results from Kenya (Sindi and Kirimi 2006). This gender bias could be explained by the observation from the sample that females heading households were usually widowed or divorced

and tended to possess comparatively less productive assets than male-headed households. This economic disadvantage may push household members into either short-term or long-term migration to sustain their livelihood. Further explanations related to gender include encouragement for females to migrate due to the expectation that Ethiopian females are more likely to remit than male migrants (de Brauw, Mueller, and Woldehanna 2013). In addition, return migrants, who we interviewed in our explorative study, also pointed out the demand for female migrants in destination countries (e.g., as housemaids in the Middle East and Sudan) and the dominance of men in commercial agriculture and thus short-term migration. Studies in Nicaragua (Murrugarra and Herrera 2011) also found that males predominantly migrate to areas with high agricultural labour demand.

According to the literature, increasing household size may put more pressure on household consumption and thus trigger migration, resulting in fewer mouths to feed, but migration also implies labour loss for sending households. Consistent with other studies in Ethiopia, Albania, Bangladesh, Ghana, and Moldova, we found that households' propensity to migrate increases by 48% with a one-unit increase in household size (Tsegai 2007; Hagen-Zanker, Siegel, and de Neubourg 2009; Ahamad et al. 2011; Gray and Mueller 2012). According to the explorative findings, the inheritance land division where land is divided between subsequent siblings makes the farm plots too small for sustaining a household, resulting in the search for livelihood alternatives, including migration.

In migration studies, house-quality indicators, such as types of roof, flooring, and walls, and water and electricity facilities, are often used as proxy poverty variables (Mora and Taylor 2006). In rural Ethiopia, roofs that used to be constructed from thatch are increasingly covered by corrugated iron sheeting. Ezra and Kiros (2001) identify thatched roofing as among the major explanatory variables for rural out-migration in drought-prone areas of Ethiopia. However, our logistic model reported an insignificant relation of thatched roofing with overall migration and a significant negative relation with short-term household migration decisions. Even though an iron roof is often interpreted as a sign of economic advancement, the explorative findings, particularly from the kebeles of Adisge-Miligebsa and Woken zuria, revealed limited access to thatch as an alternative explanation. This resource scarcity might have distorted the variable's informative value.

7.3 Results contributing to the discussion of ambiguous migration determinants

Previous studies have reported mixed effects of food status. While migration could result in reduced food availability for the household through the reduction of family

farm labour capacity, it can also be understood as strategy to reduce the number of mouths to be fed (Hagen-Zanker, Siegel, and de Neubourg 2009; Zezza et al. 2011). The NELM model considers migration not only as income maximization strategy but also as an option to diversify household risks (Stark and Bloom 1985). In our results, households who reported insufficient food status were observed to be four times more likely to send migrants, or, more specifically, six times more likely to have short-term and three times more likely to have long-term migrants.

In the literature, migration is conceptualized as a life-cycle event (Görlich and Trebesch 2008; Olowa and Awoyemi 2012): Households headed by older persons are expected to have fewer dependent children but more family members in the working age group. Thus, the household head's age was reported as having a positive effect on migration in Guatemala (Adams 2006). By contrast, Görlich and Trebesch (2008) reported a negative effect for Moldova. Our results in Ethiopia show that a ten-year increase in the household head's age raises the propensity to migrate by 74%, with a higher effect on long-term migration (82%) than on short-term migration (44%). Furthermore, a higher dependency ratio may push migration due to the search for more income for dependent household members or, by contrast, may constrain migration due to the demand for labour at home. Like Görlich and Trebesch (2008) for Moldova, our results also reveal a significant negative effect of the number of dependents in a household on long-term migration decisions.

In Ethiopia the state allocates land titles and land use rights through local governments (kebeles). In our analysis, we identified no significant explanatory value of our two categories of land endowment: households owning no or less than one hectare of land and those possessing one hectare or more. On the one hand, scholars emphasize the transaction costs of migration, which can be covered more easily by better-off households with more land (Mckenzie and Rapoport 2007). On the other hand, abundance of farm land can reduce the economic pressure for out-migration, such as indicated by recent studies in Ethiopia (Bezu and Holden 2014), Kenya (Sindi and Kirimi 2006), or Mexico (Mora and Taylor 2006).

Furthermore, recent land policy reviews in Ethiopia argue that the frequent land redistribution and the tenure insecurity inhibits rural people from migrating (Rahmato 2004; de Brauw and Mueller 2012). Moreover, qualitative interviews in the kebele Adisge-Miligebsa showed additional land rights insecurity due to the National Park and associated rumours of future resettlement plans. Land use right documentation and certification has been underway in the study region, as in other administrative regions (Rahmato 2004; Hailu and Backstrom 2006; Deininger et al. 2007). De Brauw and Mueller (2012) suggest that land use security reduces the expropriation risks of households and thus increases migration. Moreover, households with a larger land

endowment can afford to educate their children, which increases their propensity to migrate to destinations with better paying non-farm jobs (Bezu and Holden 2014).

These mixed migration effects documented in the literature might also explain why land endowment was not identified as a predictor of the sample households' migration decisions in our research. In the exploratory study, return migrants and other locals reported that brokers support international migration to Sudan (direct brokering) and the Middle East (usually via an agent) by facilitating transport and providing contact persons and jobs in the destination country. Brokers also accept ex-post remuneration for their services from the money earned abroad.

In the sustainable livelihoods approach, migration is conceptualised as one of several livelihood strategies in developing countries (Ellis 2003). If the number of economic activities is limited, migration is seen as a strategy for income diversification (Ellis 2000). In contrast to this assumption, an empirical study in Kenya (Sindi and Kirimi 2006) showed that off-farm and non-farm activities are often only carried out on a small-scale level and therefore are not financially satisfying. Therefore, despite numerous activities, households continue to seek out alternative livelihood strategies, including migration. In our study, an additional economic activity showed a positive albeit small relation (increase of 20%) with the likelihood of sending a short-term migrant, but does not show a significant interrelation with long-term migration.

The coefficients for farm size, draught animals, and livestock assets, which are commonly regarded as suitable indicators of economic and productive household assets in rural Ethiopia (Dercon, Hoddinott, and Woldehanna 2005; Little et al. 2006; Gray and Mueller 2012; Bezu and Holden 2014), did not show a significant explanatory value for the migration decisions of our sample households. Similarly, nor could these variables explain migration decisions in Mexico (Mora and Taylor 2006).

7.4 Results supplementing the NELM framework

The NELM framework and associated literature allowed us to conceptualize household-level characteristics that affect migration decisions. In accordance with the model, we found empirical evidence that relative inequality between households in terms of demography, economic activity, and asset and food status distinguish migrant-sending from non-migrant-sending households. However, one shortcoming of the NELM framework is that it does not establish a connection between households' migration decision and contextual factors. Our findings illustrated that the livelihood zones – as a proxy for local agroecology, market access, and production systems – strongly affect migration choices, particularly short-term migration decisions. Therefore, we identified

evidence of selection of migration strategies based on diverging comparative location advantages in different study sites.

A study conducted in Mexico (Mora and Taylor 2006) shows an effect of location factors on the probability of a decision for international migration rather than internal migration. Bilsborrow (2002) also emphasises that places' different economic opportunities and the contextual factors of households influence peoples' migration decisions. As location seems to matter, and as only a few previous migration studies have included the contextual factor of household location (Taylor 1999; Ezra and Kiros 2001; Olowa and Awoyemi 2012), future empirical migration studies might be well advised to extend the NELM framework with locational meso-level variables in a multi-level analysis, particularly if they include short-term migration.

8. Conclusion

The quasi-longitudinal and context-specific research design might have improved the validity and reliability of the results, but cannot account for omitted or unobservable variables or sampling bias. Acknowledging these limitations, the results show that long-term migration is driven by education and dependency ratio, whereas short-term migration very much depends on locational advantages and food insufficiency. In line with the NELM framework, we statistically confirm positive relationships between migration and household characteristics such as perceived food insufficiency and female household heads. Despite the NELM framework's merit in explaining migration as a strategy to decrease household risks and to improve overall living conditions, our empirical evidence also shows that rural households in comparable economic, demographic, and human capital circumstances do not necessarily opt for the same migration strategies, due to diverging locational advantages or constraints. Households close to commercial cash-crop areas have a locational advantage for seasonal migration and thus less pressure for long-term migration. Thus, household-based migration studies should also take into account meso-level variables of the local context.

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