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Internal migration in the Upper Mekong Delta, Viet Nam: What is the role of climate- related stressors?

Abstract

The present paper reports on a case study that investigated under what circumstances households use migration to cope with climate variability and food insecurity. Fieldwork was conducted in three communities in Dong Thap Province in the Upper Mekong Delta in Viet Nam. Methods used included a household survey (N=150), participatory research tools and key informant interviews. Ninety per cent of the survey respondents reported that climate-related stressors, such as floods, storms and changes in rainfall patterns, had adversely affected their livelihoods. Those effects, however, were more often qualified as being “moderate” rather than being “severe”, and for the survey population as a whole, no evidence was found that climatic stressors were principal drivers of migration from the area. The Upper Mekong Delta in Viet Nam is undergoing rapid economic development, with increasing migration mostly being driven by demand for labour in industrial centres. However, an analysis differentiated by income groups reveals that poorer households with little or no land are much more likely to be severely affected by climatic stressors than non-poor households. Their ability to cope and adapt locally is limited, and migration, which in most cases tends to be internal, is a common alternative. The present paper shows the importance of disaggregating climate impacts and migration causes for different socioeconomic groups.

By Kees van der Geest, Nguyen Viet Khoa and Nguyen Cong Thao¹

Keywords: Migration, livelihood, food security, climate change, climate variability, floods, poverty, landlessness, Mekong Delta, Viet Nam

1. Kees van der Geest is an associate academic officer at the Institute for Environment and Human Security (UNU-EHS), United Nations University, Bonn, Germany, e-mail: kgeest@gmail.com; Nguyen Viet Khoa, is Head of the Training and Education Division at the National Agriculture Extension Centre, Ministry of Environment and Rural Development (MARD), Hanoi; Nguyen Cong Thao is acting director at the Environmental Anthropology Department, Viet Nam Academy of Social Sciences, Hanoi.

1. Introduction

Viet Nam is one of the world's most vulnerable countries in terms of climate change impacts and extreme weather events due to the following characteristics: a lengthy coastline; frequent occurrence of typhoons; strong dependency on agriculture; and some of the country's most exposed areas are also the most densely populated. A one metre sea-level rise would, without accounting for current and future adaptation measures, affect 10.8 per cent of the population (Dasgupta and others, 2007). It would inundate 9.3 per cent of the country's surface and 37.8 per cent of the Mekong Delta region (UN Viet Nam, 2009). According to the Intergovernmental Panel on Climate Change (IPCC), more than one million people may need to relocate from or within the Mekong Delta because of sea-level rise by the year 2050 (Parry and others, 2007). As such, it is one of the world's three extreme hotspots in terms of population vulnerability to sea-level rise. Viet Nam has further been identified as one of the top 15 countries in the world in terms of vulnerability to natural hazards, such as floods and storms (Dilley and others, 2005). Similarly, Germanwatch ranked Viet Nam sixth in its Climate Risk Index for the period 1991-2010 (Harmeling, 2011).

Large parts of Viet Nam, especially in the Red River and Mekong deltas, are flooded every year. During the months of heavy rainfall, water from the upstream sections of major rivers is added to local precipitation and saturates the earth. Rivers overflow and flood the broad plains of the river deltas. Floods in the Mekong Delta have a low discharge capacity, especially during high tide, and cause prolonged, deep inundation, riverbank erosion, salt intrusion and transportation problems. In the previous 20 years, the Mekong Delta has endured several "very high" floods, particularly in 1994, 1996, 2000 and 2011 (for a regional definition of "very high" floods, see Tuan and others (2008, p. 30)). Those high floods inflict casualties and severe damage to houses and rice fields (Tuan and others, 2008). Moderate floods, locally referred to as *ngập nông* (nice floods) tend to have more beneficial effects; they cause less widespread damage and contribute to soil fertility and prosperity in the area (Dun, 2011).

As early as 1990, IPCC predicted that impacts of climate change, such as coastal erosion, flooding and droughts, would displace large populations worldwide (Warner and Laczko, 2008). It took more than a decade for the scientific community to start examining more thoroughly whether climatic changes and extreme weather events alter migration patterns. In the past five to ten years, the debate has moved from the question of *whether* environmental changes influence migration patterns (Jäger and others, 2009; Warner, 2010) to *how* (Foresight, 2011) and *under which circumstances* (Warner and Afifi, 2014) this is the case.

Some key insights about the link between climate and migration are that: (1) climate-induced migrants usually move within national borders

(Gemenne, 2011; van der Geest, 2011); (2) climate factors are rarely the sole cause of population movements (multi-causality) (Kniveton and others, 2011); (3) climate factors usually do not influence mobility patterns *directly*, but, instead, through their effect on other drivers of migration (Foresight, 2011); and (4) in situations of climate stress, not all people can respond by migrating; some have to stay put involuntarily because they lack the possibilities to migrate; in other words, they are trapped (Black and others, 2013).

The present paper attempts to contribute to the emerging body of knowledge on the use of migration as a risk management strategy vis-à-vis climatic stressors. It does this through an income-group-differentiated analysis of climate impacts and reasons for migration in the Upper Mekong Delta in Viet Nam. The aim of this analysis is to enhance understanding of the circumstances under which climate threats, in conjunction with other causal factors, influence migration decisions.

2. Migration trends in Viet Nam

Migration is not a new phenomenon in Viet Nam. During the French colonial period (1858–1954), circular movement of agricultural workers between rural areas was common. Rural–urban migration increased sharply in the 1930s, 1940s and early 1950s. Migration from lowland to upland areas also became more popular during this colonial period because large numbers of labourers were needed for the upland plantations (Anh, 2008; Hardy, 2005). In 1954, the French colonial period ended and Viet Nam was divided into two zones, North and South. Following the partition, approximately 900,000 people moved from the north to the south, and 100,000 from the south to the north (Duiker, 1983).

During hostilities between the northern and southern parts of the country in the period 1955–1975, population movement differed greatly between regions. In the north, people were moved from cities to the countryside to escape bombing, while in the south, people in the rural areas were moved to urban areas to prevent them from potential contact with Communist forces. Following reunification in 1975, there was large-scale movement of people in the south, to their home villages. In the same period, a large number of people (were) moved from overcrowded metropolitan areas to virgin lands with the establishment of new economic zones (Hardy, 2005). Migration to large cities was discouraged in this period. Until the Doi Moi reform process, which began in 1986, migration flows were to a large extent State-managed. Even though individuals and their families had some manoeuvring space before Doi Moi, and current migration policy has been shaped to a large extent by the history of State management of migration (Djamba and others, 1999; Zhang and others, 2006), the general trend is that “spontaneous migration” has gradually increased in importance, and rural–urban migration has become more prominent. Since 1986, millions

of Vietnamese have left their villages and settled in cities and industrial zones (Anh, 2008). While living conditions in the villages have not necessarily worsened, a feeling of poverty compared to people living in cities (relative deprivation) lays at the root of increasing migration towards urban areas (Skeldon, 2002). Many have also moved to other rural areas where aquaculture is practised and agricultural commodities for the international market are produced (Winkels, 2012). In the 2000s, rural–urban migration within provinces has increased sharply. This is related to the establishment of new industrial parks in smaller towns that attract labourers from surrounding rural areas (Central Population and Housing Census Steering Committee, 1999; 2010). Another recent trend is that more women and young people are migrating. According to Tacoli and Mabala (2010), this is not only because women and young people are better suited for the employment opportunities in destination areas, but also due to dwindling opportunities at home and changing intra-household power relations, with women and youth gaining more autonomy over migration decisions.

As indicated in the 2009 Population and Housing Census, the Mekong Delta region had the highest domestic outmigration rate in Viet Nam. In the period 1994–1999, the domestic five-year outmigration rate for the region was 24.59 per 1,000 inhabitants. In the period 2004–2009, the figure had more than doubled, to 56.7 out-migrants per 1,000 inhabitants (UN Viet Nam, 2010: 27). These data comprise people who had officially settled and registered in a different region in the preceding five years. The population census in Viet Nam excludes temporary and non-registered migrants (UN Viet Nam, 2010).

Literature on migration trends in Viet Nam fails to cover the role of climate variability as a cause of migration. With the exception of recent work by Dun (2011; 2012), no articles about the climate–migration nexus in Viet Nam have appeared in peer-reviewed literature. More generally, environmental factors, including climate, have only recently gained attention as possible migration causes (Piquet, 2012). The present study tries to contribute to the debate by disentangling the circumstances under which climatic factors may influence mobility patterns.

3. Methods and research area

A mixed-method approach was used in this study, combining qualitative and quantitative research tools. The main data source is a questionnaire survey of 150 households, which yielded mainly quantitative data. In addition, the survey team organized 34 participatory rural appraisal (PRA) sessions, which included 264 local residents as participants. The participatory research tools included focus group discussions, transect walks, wealth-ranking exercises and mobility mapping. The team also conducted 15 expert interviews with community representatives (village chiefs, the chairman of the Commune People’s Committee and the

chiefs of the Women's Union and the Farmer's Union), staff of national government agencies, such as the National Institute of Meteorology, and provincial and district officers of the Department of Agricultural and Rural Development (DARD) and the Department of Natural Resources and Environment (DONRE). The qualitative data from participatory research tools and expert interviews did not play a central role in this paper, but instead were used to explain the context and decision-making processes, which were hard to capture in the questionnaire survey. Lastly, existing regional data on climate, agriculture, economy and demographics were collected, particularly at the provincial level (Dong Thap Province, see figure 1). The methods, which were designed for a larger set of case studies, are described in more detail by Rademacher-Schultz and others (2012).

Figure 1: Map of Viet Nam, indicating the research area (Dong Thap Province)



Source: Khoa and others (2012, p. 17)

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Fieldwork was conducted during October-November 2011, with a team of four senior researchers, who facilitated focus group discussions, and other participatory research tools and supervised five junior researchers, who conducted the questionnaire interviews. The three villages selected

for the research were in Hung Thanh Commune (Thap Muoi District, Dong Thap Province). An important limitation of the research was that it did not follow migrants to their destinations. Fieldwork took place only in the migrant source area. Hence, when entire households had migrated, they could not be captured in the household survey.

Hung Thanh is a typical rural commune in the Mekong Delta region, where rice cultivation and fishing are the main sources of food and income. An elevated tarmac road, which was completed around 2005, passes through the commune. On both sides of the road, there is a narrow strip of elevated land that provides dry ground on which people can build their houses. The paddy fields start right behind the houses and cover approximately 80 per cent of the commune's land area of 5,812 hectares. In 2011, there were 8,745 inhabitants and 2,105 households in the commune (data on land use and population were provided by the Commune People's Committee). The commune has a small market, a clinic and education facilities for pupils up to 15 years of age.

During the fieldwork, the Mekong Delta was experiencing the highest floods in ten years, and the research area was entirely inundated, except for the small, elevated strip along the provincial road. For security reasons, the team was not allowed to travel by boat to interview households located off the main road. In order to reduce the bias this caused in the survey sample, the team interviewed household heads who lived in flooded areas when they accompanied their children to school by boat or when they came to the main road to do errands. Still, it is recognized that the 150 households surveyed may not be representative of the whole population of Hung Thanh Commune.

Compared to many other parts of the Mekong Delta, the research area is somewhat less exposed to climate threats. It is more than 100 kilometres from the coast, making it less exposed to typhoons; it is not very low-lying so there is less threat from sea-level rise and salinity intrusion; and with 150 inhabitants per square kilometre, the commune is less densely populated than most of the other ones in the delta.

Secondary data, gathered from meteorological stations, ministries and the Census Office sketch some broad trends in the research area that are related to the key variables in the research — climate, livelihood/economy and migration (more details are in Khoa and others, 2012). The data reveal that over the past one to three decades, Dong Thap Province has experienced the following:

- (1) an increase in total annual rainfall and heavy rainfall events;
- (2) a reduction in average flood levels, but extremely high floods in 2011;

- (3) substantial growth in rice production, much faster than population growth;
- (4) a significant rise in GDP;
- (5) a sharp increase in outmigration.

The context for the research is an area of moderate climatic changes, overall economic growth and development and increasing freedom of movement. Until the Doi Moi reform process began in 1986, migration flows were heavily controlled by the government. Since then, restrictions on people's movements have reduced substantially. It is important to take such factors into account. Local livelihoods may be affected by climate-related stressors, but significant economic growth, rapid development, demographic change and political reform shape the conditions under which people decide where they want to live. Population growth and changes in population composition further influence mobility patterns through their effect on employment and access to limited natural resources.

4. Results

In this section, we present an analysis of climate impacts and reasons for migration, differentiated by income groups. The analysis shows the importance of disaggregating climate impacts and migration causes for different socioeconomic groups.

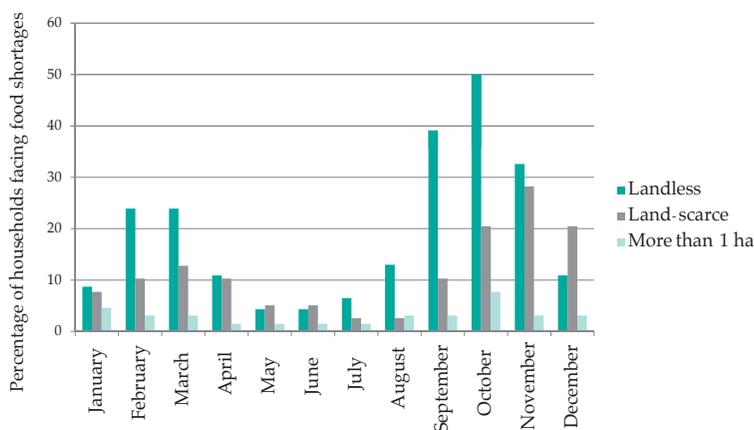
Land ownership plays a key role in local wealth distribution. About a third (30.7 per cent) of the surveyed households are landless, while land-scarce households – owning less than one hectare – made up 26 per cent of the household sample. The remaining households (43.3 per cent) own an average of 2.4 hectares of land. More than 80 per cent of the landless households in the survey sample earn less than one dollar per capita per day, against only 11 per cent of the households that own at least one hectare of farm land.

Almost all households that own land have their own rice farm. The vast majority indicate that their rice yields are negatively affected by changing rainfall patterns and changing flood regimes. Nevertheless, most respondents also report that rice productivity is improving as a result of better seed varieties, improved techniques, increased use of fertilizers and a higher frequency of cultivation. Hence, the negative impact of climatic changes is to some extent offset by positive changes to agricultural practices and resources.

Despite this positive overall development in rice productivity, 18.0 per cent of the respondents report that their households have experienced “inadequate food intake” at some point in the past year, and 23.3 per

cent in the past 5 to 10 years. Among landless households, the figures are much higher: 41.3 per cent in the past year and 52.2 per cent in the past 5 to 10 years. Food insecurity reaches its peak in the flood season, from September to November, particularly for landless people (see figure 2). The latter mostly work as farm labourers and demand for labour is low in the flood season.

Figure 2: Households “regularly” facing food shortage, by month and by land holding



Source: Fieldwork Household Survey, October 2011.

Impact of climatic hazards and changing rainfall patterns

In focus group discussions, during which the research team asked local people about changes in rainfall patterns in the past ten to twenty years, there was agreement about the following three changes: (1) the rainy season comes earlier and lasts longer; (2) total rainfall has increased; and (3) extreme weather events, such as storms, heavy rainfall events and thunder and lightning, have become more frequent and severe. The questionnaire yielded similar findings. These local perceptions of rainfall changes tally with meteorological data for the area (see Khoa and others, 2012 for a more detailed analysis of local rainfall data). People also noticed changes in flood regimes. Most questionnaire respondents and focus group participants felt that the floods were starting and receding later and that flood levels were rising. However, monthly flood-level data (1990-2010) from the nearest hydrological station do not clearly confirm this. According to data from the station, flood levels have been slightly lower in the 2000s than in the 1990s, and no clear trend in the start and end of the flood season is discernible (see Khoa and others, 2012 for a more detailed analysis of flood-level data). It is not uncommon that people’s perceptions of local climate-related changes differ from official

data (Schmidt-Verkerk, 2011). Discrepancies can result from inaccurate measurements or problems of scale, as well as from factors that influence people's perception, such as a tendency to romanticize the past. In the case of flood perceptions in Hung Thanh Commune, perceptions of longer-term change were probably influenced by recent events; during the fieldwork for this research the highest flood in ten years occurred.

The questionnaire inquired about impacts of climatic stressors on food production and the household economy. Stressors were mainly flooding, heavy rainfall events, storms and changing rainfall patterns (more rain and a longer rainy season). Ninety per cent of the respondents reported adverse effects, particularly on crops and houses or properties. Only 10 per cent reported no adverse effects. Within the group that incurred negative effects, most qualified the impacts as being "moderate". "Severe" impacts were reported less frequently (see table 1). This is not surprising. The climatic changes that people in the research area have experienced so far are quite subtle, and extreme weather events, such as typhoons, occur less frequently there than along the coast. Moreover, agricultural production in the area is only partly dependent on local rainfall conditions.

Table 1: Impacts of climate-related stressors, by income group

Income group	Income/cap/day	Severe impact	Moderate impact	No impact	Total
Very poor	Less than \$1	22 (46%)	20 (42%)	6 (13%)	48 (100%)
Poor	\$1 to 2	12 (30%)	25 (63%)	3 (8%)	40 (100%)
Non-poor	More than \$2	8 (19%)	30 (71%)	4 (10%)	21 (100%)
Total		42 (32%)	75 (58%)	13 (10%)	130 (100%)

Source: Fieldwork Household Survey, October 2011.

Notes: Climate-related stressors included floods, changes in rainfall patterns and extreme weather events, such as storms and extreme rainfall. Total income per capita per day was calculated as the sum of income from different sources (crop sales, livestock sales, fish sales, non-farm income, remittances and rent), and cross-checked with household estimations of the total income. In 13 cases, the difference was larger than a factor of 2; these households were excluded from the analysis. There were seven missing values for impact.

Whereas impacts of climate-related stressors have been relatively moderate overall, an analysis differentiated by income group, also in table 1, shows that this is much less the case for people who are poor, and especially for those that are very poor. The percentage of very poor respondents reporting severe impacts was more than twice as high as

the percentage among non-poor households. This is despite the fact that a majority of the very poor were landless and did not cultivate their own crops. Thus, the severe impacts reported by this group came only partly from damage to rice crops. Many in this group were farm labourers. These labourers particularly lamented the fact that the rainy season and the flood season last longer and that there are more days with thunderstorms and lightning. On those days, they have no work, and for many of them, a day without work means a day without having enough money to feed the household. The very poor also reported severe impacts from extreme weather on their houses, which tended to be of poor quality.

Migration

Reliable migration data at the commune level are lacking, but the household survey yields several indications that migration from Hung Thanh Commune is a recent phenomenon that has increased sharply over the past decade:

1. The vast majority (91.1 per cent) of the household members with migration experience made their first trip after 2000, with 71.5 per cent of them made their first trip after 2005.
2. In households that contained at least one member with migration experience, the first migrant was more often a child (66.7 per cent) than a parent (33.3 per cent).
3. Transfers from migrants to their families in the area of origin increased sharply over the past ten years. For 17.3 per cent of the households, transfers from internal migrants had become one of the three principal sources of income against only 2.7 per cent ten years ago.

The household survey reveals that in 90 out of 150 households (60 per cent), at least one current member has migrated from Hung Thanh Commune to other communes, provinces or regions in Viet Nam. A total of 168 household members have migrated, either seasonally (45.6 per cent), for a longer period (48.1 per cent) or for both (6.3 per cent). Men (63 per cent) migrated more than women (37 per cent). Exactly half are current migrants, and the other half are returned migrants. None of the households have international migrants. On average, migrants from Hung Thanh Commune were 22 years old at the time of their first migration. Almost half of the migrants have moved to destinations outside the Mekong Delta region, but still within the southern part of Viet Nam. They mostly go to Ho Chi Minh City, Binh Duong and Dong Nai, where they find jobs in industry. People from Hung Thanh Commune who migrate within the province are mainly seasonal migrants who work as farm labourers or in local factories for periods shorter than six

months, usually during the flood season, when there is less work in their own community.

The sharp increase in internal migration in the past decade is to a large extent related to structural changes in the Viet Nameese economy and society. There is large demand for labourers in industrial centres, while the increasing levels of education and access to communication technology have prompted many young people to aspire to a more urban lifestyle. Most of the causes for increased migration from Hung Thanh Commune are related to improved opportunities. This is not the full story, however.

A number of case studies, from around the world, have found that when migration is primarily opportunity-driven, wealthier households tend to send out more migrants, while in situations in which migration is primarily survival-driven, more migrants come from poor families (see Ellis 1998; de Haan 1999; Kusters 2010; Wouterse and van den Berg 2011). Table 2 shows that the tendency towards migration from Hung Thanh Commune is inversely related to income. Two-thirds of the very poor households send out migrants, compared to only half of the non-poor households. This difference is still moderate, but if migration purposes are taken into account, the gap between poor and non-poor is much larger; only 23 per cent of non-poor households have members who migrated for work, while in the case of very poor households, the figure is 60 per cent. The picture for student migration is opposite: 30 per cent for non-poor households against only 10 per cent for the poor and very poor. These findings indicate that for members of poor and very poor households, migration is not only opportunity-driven; pressures on local livelihoods also play an important role.

The household survey also contained questions about reasons for migration. Respondents were asked to indicate on a list of 40 potential reasons whether each of those reasons had been important in their or their household members' decision to migrate. Table 3 contains the ten most frequently mentioned reasons. The reasons for migration are arranged according to the income group for which each reason was the most relevant. The table shows that the conditions that make people decide to migrate differ among socioeconomic groups in the research area. On par with results of a similar case study conducted in Thailand (Sakdapolrak and others, 2014), respondents in non-poor households indicated more often that good job opportunities in urban areas were an important reason for them to migrate. Another important pull factor for non-poor households was that they perceived urban areas as more attractive places to live. By contrast, respondents in poor and very poor households indicated more often that unemployment, lack of income and landlessness were important reasons to migrate.

Table 2: Migration tendency and purposes, by income group

Income/cap/day	N=	No. of migrants in HH	Economic migrants in HH	Educational migrants in HH	Other migrants in HH
Very poor: < \$1	52	17 (33%)	31 (59%)	5 (10%)	3 (6%)
Poor: \$1-2	42	19 (45%)	19 (45%)	4 (10%)	2 (5%)
Non-poor > 2 \$2	43	21 (49%)	10 (23%)	13 (30%)	1 (2%)
Total	137	57 (42%)	60 (44%)	22 (16%)	6 (4%)

Source: Fieldwork Household Survey, October 2011.

Notes: There are 13 missing values for income / cap / day (see note to table 1); HH = household; "Other migrants" mainly moved for family reasons; multiple answers possible, for example, a household could have economic migrants, as well as educational migrants.

Table 3: Migration reasons, by income group

Migration reason	Very poor (n=35)	Poor (n=23)	Non-poor (n=18)	Total (n=76)	Rank
Most common among the very poor					
Unemployment	83%	83%	56%	76%	2
Not enough land for farming	77%	44%	28%	55%	5
Work for my skills not available	31%	30%	28%	30%	9
Most common among the poor					
Not enough income	80%	87%	61%	77%	1
Not satisfied with livelihood	51%	61%	22%	47%	6
Not enough fish	31%	39%	22%	32%	8
Better living quality in city	20%	35%	33%	28%	10
Most common among the non-poor					
No school for children in village	46%	52%	78%	55%	4
Better job opportunities	51%	61%	67%	58%	3
City attracts me	20%	35%	56%	33%	7

Source: Fieldwork Household Survey, October 2011.

Notes: The questions about migration reasons were only asked if at least one household member had migrated, which was the case in 90 households. There are 13 missing values for income group (see table 1) and one for migration reasons. The last column contains rankings for the overall importance of migration reasons.

The prime causes of migration among poorer households are indirectly related to climate variability. Changing rainfall patterns and extreme weather have a negative impact on people's sources of food and income. These factors, in turn, are important drivers of migration, especially for poor and land-scarce households. As Black and others (2011a) underline in their framework for understanding the effect of environmental change on migration, environmental factors tend to influence migration indirectly, mostly through economic drivers (see also Foresight, 2011). Climate variability affects local livelihoods and the prime reasons to migrate are related to lack of livelihood security or low living standards at home.

Whether migration is beneficial to the migrant and his or her family depends on who migrates and under what conditions. In focus group discussions about migrants' experiences in destination areas, participants stated that poor migrants often lacked the necessary training and skills to migrate "successfully". This, according to them, explains why many end up working in unstable jobs under hazardous conditions with low pay. Meanwhile, high costs for accommodation and daily needs in destination areas reduce savings to levels far below what their families in the place of origin might expect. Participants in focus group discussions repeatedly stated that many young migrants could barely support themselves, let alone transfer money to their families in the area of origin. Whereas migration could be a viable adaptation strategy that contributes to livelihood security (Tacoli 2009; Black and others, 2011b; Scheffran and others, 2012), these insights from participatory research tools indicate that migrants from poorer households in the study area, after moving to avoid one type of vulnerability, are exposed to another type at their new location.

5. Conclusion

This case study about the links between migration and climate-related stressors in the Upper Mekong Delta in Viet Nam shows that increased migration from the study area is partly related to increased demand for industrial labour and a desire of younger people to adopt a more urban lifestyle and move away from their rural homes and tedious work in agriculture. The study also shows, however, that an important group of poorer and landless or land-scarce households migrate because of severe pressures on their livelihood and food security. This is the group of people that experiences severe climate impacts on their household economies and food security.

As this study finds that poor, landless and land-scarce households in the study area are most affected by climate-related stressors and are also most likely to migrate, it would make sense to prioritize these groups in projects and interventions that aim to improve people's adaptive capacities. This can be done by focusing on local livelihood options,

for example, by supporting in efforts to engage in or improve non-farm income-generating activities or by helping them to upgrade their fishing and aquaculture activities. It can also be achieved by improving their migration options, for example through skills training.

Migration can contribute to a sustained improvement in livelihood security for migrants themselves and the quality of life of their children and their relatives who stay behind. In that sense, internal migration can serve as an essential element of climate change adaptation strategies. In a context of agricultural mechanization and industrial growth, the aim should not be to keep people in place, but to ensure that they are well prepared for their migration and that it has a good chance of being “successful”. Their rights in the migration destination should be protected and, prior to migration, education and vocational training should help them to acquire the skills to migrate more successfully.

If migrants are well prepared, migration can help make societies become less vulnerable to climate change. By contrast, if people move as a last resort or as a survival strategy, they run the risk of becoming even more vulnerable in their destination areas.

References

- Anh, D.N. (2008). Labour migration from Viet Nam: issues of policy and practices. Working paper No. 4, International Labour Organization Regional Office for Asia and the Pacific.
- Black, R., and others (2011a). The effect of environmental change on human migration. *Global Environmental Change*, vol. 21, Suppl. 1, pp. S3–S11.
- _____ (2011b). Climate change: migration as adaptation. *Nature*, vol. 478, pp. 447–449.
- _____ (2013). Migration, immobility and displacement outcomes following extreme events. *Environmental Science and Policy*. vol. 27, Suppl. 1, pp. S32–S43.
- Central Population and Housing Census Steering Committee (1999). *The 1999 Population and Housing Census: Sample results*. Hanoi.
- _____ (2010). *The 2009 Viet Nam Population and Housing Census: Major findings*. Hanoi.
- Dasgupta, S., and others (2007). The impact of sea level rise on developing countries: a comparative analysis. World Bank Policy Research Working Paper 4136. Washington, D.C: World Bank.

- de Haan, A. (1999). Livelihoods and poverty: the role of migration – a critical review of the migration literature. *Journal of Development Studies*, vol. 36, No. 2, pp. 1-47.
- Dilley, M., and others (2005). *Natural Disaster Hotspots: A Global Risk Analysis*, vol. 1. Disaster Risk Management Series No. 5. Washington, D.C: World Bank.
- Djamba, Y., A. Goldstein, and S. Goldstein (1999). Permanent and temporary migration in Viet Nam during a period of economic change. *Asia-Pacific Population Journal*, vol. 14, No. 3, pp. 25-48.
- Duiker, W.J. (1983). *Viet Nam: Nation in Revolution*. Boulder, United States: Westview Press.
- Dun, O. (2011). Migration and displacement triggered by floods in the Mekong Delta. *International Migration*, vol. 49, Suppl. 1, e200-e223.
- _____ (2012). Agricultural change, increasing salinisation and migration in the Mekong Delta: insights for potential future climate change impacts? In *Climate Change, Migration and Human Security in Southeast Asia*. Lorraine Elliott, ed. RSIS Monograph No 24. Singapore: S. Rajaratnam School of International Studies.
- Ellis, F. (1998). Household strategies and rural livelihood diversification. *Journal of Development Studies*, vol. 35, No. 1, pp. 1-38.
- Foresight (2011). *Migration and Global Environmental Change: Future Challenges and Opportunities*. Final project report. London: Government Office for Science.
- Gemenne, F. (2011). Climate-induced population displacements in a 4°C+ world. *Philosophical Transactions of the Royal Society A*, vol. 369, No. 1934, pp. 182-195.
- Hardy, A. (2005). *Red Hills: Migrants and the State in the Highlands of Viet Nam*. Singapore: Institute of South East Asian Studies.
- Harmeling, S. (2011). Global climate risk index 2012: who suffers most from extreme weather events? Weather-related loss events in 2010 and 1991 to 2010. Briefing paper. Bonn, Germany: Germanwatch.
- Jäger, J., and others (2009). *Environmental Change and Forced Migration Scenarios Project Synthesis Report*. Brussels, Belgium: European Commission.

- Khoa, V.N., N.C. Thao, and K. van der Geest (2012). "Where the Rain Falls" project. Case study: Viet Nam. Results from Dong Thap Province, Thap Muoi District. Report No. 8. Bonn, Germany: United Nations University Institute for Environment and Human Security (UNU-EHS).
- Kniveton, D., C. Smith, and S. Wood (2011). Agent-based model simulations of future changes in migration flows for Burkina Faso. *Global Environmental Change*, vol. 21, Suppl. 1, pp. S34-S40.
- Kusters, K. (2010). Which role for the non-farm sector in a forested landscape? Lessons from Krui, Indonesia. *Forests, Trees and Livelihoods*, vol. 19, Issue 4, pp. 319-340.
- Parry, M.L., and others, eds. (2007). *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom: Cambridge University Press.
- Piquet, E. (2013). From "primitive migration" to "climate refugees": the curious fate of the natural environment in migration studies. *Annals of the Association of American Geographers*, vol. 103, No.1, pp. 148-162.
- Rademacher-Schulz, C., and others (2012). *Rainfall variability, food security and human mobility: An approach for generating empirical evidence*. Intersections No. 10. Bonn, Germany: UNU-EHS.
- Sakdapolrak, P., P. Promburom, and A. Reif (2014). Why successful *in-situ* adaptation with environmental stress does not prevent people from migrating? Empirical evidence from Northern Thailand. *Climate and Development*, vol. 6, No. 1, pp. 38-45.
- Scheffran, J., E. Marmer, and P. Sow (2012). Migration as a contribution to resilience and innovation in climate adaptation: social networks and co-development in Northwest Africa. *Applied Geography*, vol. 33, p. 119-127.
- Schmidt-Verkerk, K. (2012). The potential influence of climate change on migratory behaviour: a study of drought, hurricanes and migration in Mexico. Doctoral thesis, University of Sussex.
- Skeldon, R. (2002). Migration and poverty. *Asia-Pacific Population Journal*, vol. 17, No. 4, pp. 67-82.
- Tacoli, C. (2009). Crisis or adaptation? Migration and climate change in a context of high mobility. *Environment and Urbanization*, vol. 21, No. 2, pp. 513-525.

- Tacoli, C., and R. Mabala (2010). Exploring mobility and migration in the context of rural–urban linkages: why gender and generation matter. *Environment and Urbanization*, vol. 22, No. 2, pp. 389-395.
- Tuan, L.A., and others (2008). Floods and salinity management in the Mekong Delta, Viet Nam. In *Challenges to Sustainable Development in the Mekong Delta: Regional and National Policy Issues and Research Needs*, T.T. Be, B.T. Sinh and F. Miller, eds. Stockholm: Sustainable Mekong Research Network, pp. 15–68.
- United Nations, Viet Nam (2009). Climate change fact sheet: the effects of climate change in Viet Nam and the United Nations (UN) responses. Hanoi.
- _____ (2010). Internal migration: opportunities and challenges for socio-economic development in Viet Nam. Hanoi.
- van der Geest, K. (2011). *The Dagara Farmer at Home and Away: Migration, Environment and Development in Ghana*. Leiden: African Studies Centre.
- Warner, K. (2010). Global environmental change and migration: governance challenges. *Global Environmental Change*, vol. 20, pp. 402-413.
- Warner, K., and T. Afifi (2014). Where the rain falls: evidence from eight countries on how vulnerable households use migration to manage the risk of rainfall variability and food insecurity. *Climate and Development*, vol. 6, No. 1, pp. 1-17.
- Warner, K., and F. Laczko (2008). Migration, environment and development: new directions for research. In *International Migration and Development: Continuing the Dialogue: Legal and Policy Perspectives*. J. Chamie and L. Dall’Oglio, eds. Geneva: CMS and IOM.
- Winkels, A. (2012). Migration, social networks and risk: the case of rural-to-rural migration in Viet Nam. *Journal of Viet Namese Studies*, vol. 7, No. 4, pp. 92-121.
- Wouterse, F., and M. van den Berg (2011). Heterogeneous migration flows from the Central Plateau of Burkina Faso: the role of natural and social capital. *Geographical Journal*, vol. 177, No. 4, pp. 357-366.
- Zhang, H.X., and others (2006). Migration in a transitional economy: beyond the planned and spontaneous dichotomy in Viet Nam. *Geoforum*, vol. 37, No. 6, pp. 1066-1081.