RESEARCH ON VULNERABILITY TO POVERTY: A VILLAGE CASE STUDY FROM THAILAND

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To my beloved parents, Annegret and Dieter

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ABSTRACT

Emerging market economies in Southeast Asia have undergone a series of parallel changes in the course of continued economic growth. To achieve income growth and to reduce risk, rural livelihoods increasingly rely on off-farm income and remittances, while dependency on farming declines. Younger household members in particular often seek off-farm employment outside their natal villages. As a consequence, village families transform into multi-location households with sub-households in urban areas. These urban sub-households are not independent of the rural household since migration is part of the livelihood strategy of wider households. As such, migrants often retain strong social network ties to the village household while limiting their social integration at the urban destination.

These developments and changes in the course of the rural-urban transformation have major implications for poverty and vulnerability research. This thesis addresses issues which are neglected or difficult to handle in survey based poverty and vulnerability studies by using a village case study. The case study focuses on how the household's institutional environment of village households and social networks relate to poverty and vulnerability in transforming countries such as Thailand. In addition, this thesis aims to make a contribution to data collection methods in poverty and vulnerability research by developing and applying methods to collect data about social networks and migration in the context of a village case study and by testing how the definition of a household, which is the central unit of observation, impact data collection procedures, analyses and policy programmes.

The specific objectives of this thesis which are addressed in three different essays are as follows:

1) to contribute to a better understanding of the role of villages in emerging market economies such as Thailand, namely (a) to describe the socio-economic conditions of a typical rural village in Thailand including the economic activities in the village and those of migrant household members, (b) to compare the well-being of households whose main income source is farming with those who rely on transfer payments from their migrant household members and (c) to identify the effects of different macro-economic conditions on multi-location households in the context of the village case study,

2) to provide a better understanding of the role of village networks for poverty and vulnerability reduction in Thailand, namely (a) to identify the extent of social exclusion for different relation types (information, support and informal insurance networks), (b) to identify the pattern of multiplexity, i.e. the degree to which individuals who interact for one relation type also interact for another one, and (c) to investigate factors that determine the formation of village information, support and informal insurance networks at the household and at the individual levels and
3) to assess the implications of household definitions on the identification error when determining the target population of programme interventions under the conditions of highly mobile village populations related to rural-urban migration which is typical for emerging market economies.

The empirical basis for this research is a complete enumeration of all households of a rural village in the province of Phetchaboon some 350 km north of Bangkok. A village case study was chosen as it can be considered as a complementary research instrument to large scale surveys for poverty and vulnerability studies. An in-depth village case study can generate additional information as it is better able to take into account the complexity and dynamics of people's livelihoods in rural villages in Asian emerging market economies. A case study approach is more flexible than rigid large data sets as it relies on multiple sources of evidence and thus can identify inconsistencies and measurement errors in secondary data sources. Moreover, in case studies non-sampling errors are normally small due to high response rates and more accurate data.

The data collection of the case study comprises several sources of evidence, i.e. village documents and secondary statistics, several semi-structured interviews with representatives of institutions at the provincial and district levels in 2007 and with the village headman, village sub-group (cluster) leaders as well as with the director of the village school in 2007 and 2008, a complete enumeration of all households in 2008 and 2009 and a social network and migrant survey in 2009. The 2008 household census included 73 households. In the 2009 panel survey, the number of households was reduced to 70 households due to death and household relocation. The social network interviews were simultaneously conducted with all 216 individuals of the village households aged at least 14 years including those who temporarily

migrated to other areas in Thailand. For the 76 migrants, also additional information about their livelihoods was collected.

The core results of the study are presented in three essays referring to the chapter four to six. The objective of the first essay is to contribute to a better understanding of the role of villages in emerging market economies (objective 1). The rationale here is that in these countries rural villages have recently undergone dramatic changes. A major factor is the change in the social structure of the village as a result of out-migration of mostly younger family members to urban areas or agro-industries outside the village leading to the emergence of multi-location households. The increase in the dependency ratio potentially affects the village labour economy and village institutions. While in the past households relied on farming as the main source of livelihoods, to date, two major livelihood strategies have emerged. The first one is applied by those households who continue to be engaged in farming and who may have intensified their farming activities through accumulation of land and investments in agricultural technology. In addition, there are those households who seem to choose an exit strategy from agriculture or try to insure against risk by diversifying their income portfolio through migration. These households therefore increasingly rely on wage income from household members who migrated to industrial areas while the importance of land for households' income declines. Results of the log-linear ordinary least squares regression suggest that both agricultural- and migration-oriented livelihood strategies can be useful depending on the macro-economic conditions. In periods of economic growth, migration contributes to income growth. In spite of long periods of absence, migrants maintain strong ties to their natal household to better cope with situations of economic slowdown.

The second aims to generate better knowledge on the role of social village networks for poverty and vulnerability reduction in Thailand (objective 2). The analyses of complete network data at the household and individual levels for five different relation types, i.e. two risk-sharing, one agricultural and two employment networks, revealed that social exclusion exists but seems unrelated to ex-post income poverty. However, households may be vulnerable to poverty as, depending on the relation type, up to 30 % of the households in the village are excluded. In addition, multiplexity can be considered as high since most households choose each other simultaneously for these different relation types. The network density is generally

low. Only about 5 % of all possible dyad combinations at the household level have a tie. Dyadic regressions show that kinship and friendship are the major factors that determine the network formation. Dyadic regressions at the individual level identified that being part of the same household is no determinant for most relation types.

Finally, the third essay deals with the implications of the choice of household definition on rural development, poverty reduction and social protection programmes in Asian emerging market economies (objective 3). It revealed that the chosen household definition impacts the inclusion and exclusion of the target population for all types of interventions. The application of the headcount and the poverty gap ratio as inclusion criteria made results sensitive to the chosen poverty benchmark. Social protection programmes aiming to support the elderly are most robust to changes in the household definition. Results also suggest that the application of the multi-location household definition can increase the cost effectiveness of policy interventions in comparison to the definition which is currently used by the Thai government.
Methodologically, the thesis is adding to data collection methods for poverty and vulnerability research in three ways. First, by exploring the effect of the multi-location household definition in comparison to those commonly applied in development studies on data collection, analyses and policy programmes, this thesis contributed to the need of adjusting the household definition to better match the realities of rural households in Asian emerging market economies. Second, the data collection method applied for the thesis is a unique approach that combines a household census with a social network and migrant survey at individual level to simultaneously collect detailed household data at different locations in order to fully capture the social and economic interactions between village and migrant household members of multi-location households and its impact on poverty and vulnerability. Third, the thesis proposes a multiple methods design for poverty and vulnerability research which builds on synergies between large scale surveys and small scale village case studies and thus offsets the weaknesses of the two methods if they are applied separately.

Keywords: Thailand, village case-study, poverty, migration, social networks, household definition

ZUSAMMENFASSUNG

Anhaltendes Wirtschaftswachstum führte in den Transformationsländern Südostasiens über die letzten Dekaden zu einer Reihe gesellschaftlicher und wirtschaftlicher Veränderungen. Um Einkommenszuwächse zu ermöglichen und Risiken zu reduzieren, setzen ländliche Haushalte zunehmend auf Einkommen außerhalb der Landwirtschaft und auf Rücküberweisungen, während die Abhängigkeit von Landwirtschaft und Ackerland abnimmt. Besonders die jüngeren Haushaltsmitglieder finden häufig Beschäftigungsmöglichkeiten außerhalb der Landwirtschaft und ihrer Geburtsdörfer. Als eine Folge daraus wandeln sich traditionelle Dorffamilien hin zu multi-lokalen Haushalten mit Sub-Haushalten in Stadtgebieten. Da Migration Teil der gemeinsamen Lebensunterhaltsstrategie ländlicher Haushalte ist, agieren die Sub-Haushalte nicht als unabhängige Einheiten. Migranten halten häufig eine enge Beziehung zum sozialen Netzwerk innerhalb des Haushaltes im Dorf aufrecht, während die soziale Integration am Zielort meist schlechter ist.

Diese Entwicklungen und Veränderungen im Verlauf der ländlichen-städtischen Transformation haben erhebliche Auswirkungen auf die Armuts- und Vulnerabilitätsforschung. Diese Arbeit befasst sich mit der Frage, welchen Einfluss das institutionelle Umfeld dörflicher Haushalte und soziale Dorfnetzwerke auf Armut und Vulnerabilität in Transformationsländern wie Thailand haben. Indem eine Fallstudie auf Dorfebene verwendet wird, können Themen aufgegriffen werden, die in großen Befragungen zu Armut und Vulnerabilität oft vernachlässigt werden oder schwierig zu behandeln sind. Weiterhin zielt diese Arbeit darauf ab, einen Beitrag zu Datenerhebungsmethoden in der Vulnerabilitäts- und Armutsforschung zu leisten, indem Methoden zur Erhebung von Informationen zu sozialen Netzwerken und Migration in einer Dorf-Fallstudie entwickelt und angewandt werden und getestet wird, wie sich das Konzept des Haushaltes, das die zentrale Einheit der Beobachtung ist, auf Datenerhebung, -analyse und Interventionsprogramme auswirkt.

In drei verschiedenen Essays werden in dieser Arbeit die folgenden Zielsetzungen bearbeitet:

1) Zu einem besseren Verständnis der Rolle von Dörfern in Transformationsländern wie Thailand beizutragen, d.h. (a) die sozio-ökonomischen Aktivitäten der Einwohner und der Migranten zu beschreiben, (b) den Wohlstand von Haushalten, dessen Haupteinnahmequelle die Landwirtschaft ist, mit jenem von Haushalten zu vergleichen,

die vor allem auf Rückzahlungen von Migranten angewiesen sind, und (c) die Effekte verschiedener makroökonomischer Zustände auf multi-lokale Haushalte zu analysieren,

2) Die Rolle sozialer dörflicher Netzwerke bei der Armuts- und Vulnerabilitätsreduktion aufzudecken, d.h. (a) das Ausmaß sozialer Ausgrenzung bei verschiedenen Relationstypen (Informations-, Unterstützungs- und informelle Versicherungsnetzwerke) zu bestimmen, (b) Muster von Multiplexität, d.h. das Ausmaß, zu dem Individuen, die in einem Relationstyp interagieren, auch in einem anderen miteinander verbunden sind, aufzudecken, (c) Faktoren auf Haushalts- und Individualebene zu identifizieren, die die Bildung von dörflichen Informations-, Unterstützungs- und informellen Versicherungsnetzwerken beeinflussen und
3) Implikationen von Haushaltsdefinitionen auf den Identifikationsfehler bei der Bestimmung der Zielpopulation von Programminterventionen zu bestimmen unter den Bedingungen einer durch ländlich-städtische Migration hoch mobilen ländlichen Bevölkerung, wie sie typisch für Transformationsländer ist.

Die empirische Basis für diese Forschungsarbeit ist eine Vollerhebung der Haushalte eines ländlichen Dorfes in der nördlichen Provinz Phetchaboon, ca. 350 km nördlich von Bangkok. Die Methode einer Dorf-Fallstudie wurde gewählt, da sie in der Armuts- und Vulnerabilitätsforschung als ein nützliches, zu großen Befragungen komplementäres Forschungsinstrument betrachtet werden kann. Mithilfe einer tiefgehenden Dorf-Fallstudie können zusätzliche Informationen erhoben werden, da diese Methode es ermöglicht, die Komplexität und Dynamik der Lebensbedingungen in ländlichen Dörfern in asiatischen Transformationsländern einzubeziehen. Fallstudien sind flexibler als große starre Datensätze, da sie auf mehreren Quellen beruhen und so Inkonsistenzen und Messfehler in Sekundärdaten aufgedeckt werden können. Darüber hinaus sind Nichtstichprobenfehler in Fallstudien durch hohe eine Antwortquote und genauere Daten generell klein.

Die Datenerhebung der Fallstudie beinhaltet mehrere Quellen: Dorfdokumente und sekundäre Statistiken, mehrere halbstrukturierte Interviews mit Repräsentanten von Institutionen auf Provinz- und Distriktebene in 2007 und mit dem Dorfvorsteher, Vorstehern von Dorf-Untergruppen (Cluster) sowie mit dem Direktor der Dorfschule in 2007 und 2008, eine Vollerhebung aller Haushalte in 2008 und 2009 und eine Befragung zu sozialen Netzwerken und Migration in 2009. Der Haushaltszensus von 2009 umfasst 73 Haushalte. In der Panel-

Erhebung von 2009 reduzierte sich die Anzahl der Haushalte auf 70 aufgrund von Todesfällen und der Umsiedlung von Haushalten. Die Interviews zu sozialen Netzwerken wurden zeitgleich zur Vollerhebung durchgeführt und umfassen mit 216 Befragten alle Mitglieder der Haushalte, die mindestens 14 Jahre alt waren, inklusive der Mitglieder, die temporär in andere Teile Thailands migriert waren. Für diese 76 Migranten wurden zusätzliche Informationen zu ihren Lebensumständen in der Stadt erhoben.

Die Ergebnisse der Arbeit werden in drei Essays in Kapitel 4-7 dargestellt. Zielsetzung des ersten Essays ist es, zu einem besseren Verständnis der Rolle von Dörfern in Transformationsländern beizutragen (Zielsetzung 1). Ländliche Haushalte haben in den letzten Dekaden starke Veränderungen erfahren. Ein wesentlicher Faktor ist dabei die Veränderung der sozialen Struktur der Dörfer durch die Abwanderung jüngerer Familienmitglieder in städtische Gebiete oder in die Agrarindustrie außerhalb der Dörfer, die zum Entstehen multi-lokaler Haushalte führt. Der Anstieg der Abhängigkeitsrate kann zudem den ländlichen Arbeitsmarkt und die Dorfinstitutionen beeinflussen. Während Haushalte in der Vergangenheit vor allem auf die Landwirtschaft als Haupteinnahmequelle angewiesen waren, haben sich heute zwei unterschiedliche Strategien herausgebildet. Ein Teil der Haushalte ist weiterhin in der Landwirtschaft beschäftigt, und hat ihre Aktivitäten durch Akkumulation von Land und Investitionen in landwirtschaftliche Technologien intensiviert. Andere Haushalte haben eine Exit-Strategie aus der Landwirtschaft gewählt und sichern sich mit einem durch Migration diversifizierten Einkommensportfolio gegen mögliche Risiken ab. Diese Haushalte sind daher immer mehr vom Lohneinkommen der Haushaltsmitglieder, die in industrielle Gebiete abgewandert sind, abhängig, während die Bedeutung von Landbesitz für das Haushaltseinkommen sinkt. Die Ergebnisse der log-linearen Kleinste-Quadrate Regression legen nahe, dass beide Strategien, Landwirtschafts- und Migrationsorientierung, abhängig von der makroökonomischen Situation erfolgreich sein können. In Zeiten von ökonomischem Wachstum trägt Migration zum Einkommenswachstum bei. Die Migranten behalten dabei auch in Zeiten längerer Abwesenheit oft die Verbindung zu ihrem Dorfhaushalt bei, um mit wirtschaftlichem Rückgang besser umgehen zu können.

Das zweite Essay liefert zusätzliche Erkenntnisse über die Rolle von sozialen Netzwerken in Dörfern für die Armuts- und Vulnerabilitätsreduktion in Thailand (Zielsetzung 2). Die Analyse

vollständiger Netzwerkdaten auf Haushalts- und Individualebene für fünf verschiedene Beziehungstypen, z.B. zwei Risikoteilungs-, ein landwirtschaftliches und zwei Beschäftigungsnetzwerke, zeigen auf, dass soziale Ausgrenzung existiert, aber in keinem Zusammenhang zur ex-post Einkommensarmut zu stehen scheint. Jedoch können Haushalte vulnerabel in Bezug auf Armut sein, da -abhängig von der Beziehungsart- bis zu 30 Prozent der Haushalte des Dorfes ausgeschlossen werden. Zusätzlich zeigt sich eine hohe Multiplexität, da die meisten Haushalte sich gegenseitig als Partner für die verschiedenen Beziehungstypen auswählen. Die Netzwerkdichte ist im Allgemeinen gering. Dyadische Regressionsmodelle zeigen, dass Verwandtschaft und Freundschaft die hauptsächlichen Bestimmungsfaktoren für die Netzwerkformation sind. Auf Individualebene zeigen diese Modelle auf, dass ein Teil des gleichen Haushaltes zu sein keine Determinante für die meisten Beziehungstypen ist.

Das dritte Essay schließlich befasst sich mit der Abschätzung des Effektes der Haushaltdefinition auf die ländliche Entwicklung, Armutsreduktion und Programme zur sozialen Absicherung in asiatischen Transformationsländern (Zielsetzung 3). Die Ergebnisse zeigen, dass die gewählte Haushaltsdefinition die Aufnahme oder den Ausschluss der Zielgruppe über alle Interventionstypen beeinflusst. Die Anwendung der Headcount- und der Poverty Gap Ratio als ein Aufnahmekriterium liefert Ergebnisse, die sensibel zu dem gewählten Armutsmaß sind. Soziale Absicherungsprogramme, die auf die Unterstützung der älteren Bevölkerung abzielen, sind am robustesten gegenüber Veränderungen in der Haushaltsdefinition. Die Ergebnisse legen weiterhin nahe, dass die Anwendung der multi-lokalen Haushaltsdefinition die Kosteneffektivität von Politikmaßnahmen im Vergleich zu der Definition, welche aktuell von der thailändischen Regierung verwendet wird, steigern kann.
Methodisch trägt diese Arbeit zur Entwicklung von Datenerhebungsmethoden für die Erforschung von Armut und Vulnerabilität in dreierlei Hinsicht bei. Erstens, durch die Beleuchtung des Effektes der Anwendung einer multi-lokalen Haushaltdefinition auf Datenerhebung, -analyse und Politikmaßnahmen im Vergleich zu den üblicherweise in Entwicklungsstudien genutzten Definitionen, stellt diese Arbeit die Notwendigkeit einer Anpassung der Haushaltsdefinition heraus, um die Situation ländlicher Haushalte in asiatischen Transformationsländern besser abbilden zu können. Zweitens ist die Datenerhebungsmethode, die in dieser Arbeit angewandt wird, ein einzigartiger Ansatz, der einen Haushaltszensus mit einer sozialen Netzwerk-- und einer Migrantenbefragung auf Individualebene kombiniert um

gleichzeitig detaillierte Haushaltsdaten an verschiedenen Orten zu erheben. Diese Methode ermöglicht es, soziale und ökonomische Interaktionen zwischen Dorfbewohnern und den Migranten der multi-lokalen Haushalte abzubilden und den Einfluss dieser Interaktionen auf Armut und Vulnerabilität zu erfassen. Drittens schlägt diese Arbeit ein multiples Methodendesign für die Erforschung von Armut und Vulnerabilität vor, das auf Synergien zwischen Umfragen im großen Maßstab und kleineren Fallstudien auf Dorfebene aufbaut und somit die Schwachstellen der zwei Methoden, die bei unabhängiger Anwendung auftreten, behebt.

Schlagwörter: Thailand, Dorf-Fallstudie, Armut, Migration, Soziale Netzwerke, Haushaltsdefinition

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ADB	Asian Development Bank
AEL	Ausschusses für Entwicklungsländer
BAAC	Bank of Agricultural Cooperatives
BMN	Basic Minimum Need
CBIRD	Community Based Integrated Rural Development
CEDIO	Community Economic Development and Income Distribution
ChATEA	Challenges of the Agrarian Transition in Southeast Asia
CSAE	Centre for the Studies of African Economies
DESA	United Nations Department of Economic and Social Affairs
DFG	Deutsche Forschungsgemeinschaft
DGfG	German Geographical Society
DOAE	Department of Agricultural Extension
FAO	Food and Agriculture Organization
FGT	Foster-Greer-Thorbecke
GDP	Gross domestic product
GSO	General Statistics Office
GC	Gini coefficient
HCR	headcount ratio
HH	Household
ILO	International Labour Organization
INSNA	International Network for Social Network Analysis
KHDS	Kagera Health and Development Surveys
km	kilometre
LDD	Land Development Department
LSMS	Living Standard Measurement Study
MLG	Ministry of Local Government
MOI	Ministry of Interior
MPHS	Multi-Purpose Household Survey
MPRA	Munich Personal Research Papers in Economics Archive
MUCHS	Muhimbili University College of Health Services

NESDB	National Economic and Social Development Board
NHSCP	United Nations National Household Survey Capability Programme
NSO	National Statistical Office
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary least squares
PEGNet	Poverty Reduction, Equity, and Growth Network
PGR	poverty gap ratio
PL	Poverty line
PPL	Provincial poverty line
RPL	Relative poverty line
PSE	Paris-Jourdan Sciences Economiques
QAP	Quadratic Assignment Procedure
SAGA	Strategies and Analysis for Growth and Access
std. dev.	Standard deviation
THB	Thai Bath
TPL	National poverty line of Thailand
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNDP	United Nations Development Programme
UNU-WIDER	United Nations University World Institute for Development Economics Research
VHLSS	Vietnam Household Living Standards Survey
VLSS	Vietnam Living Standards Survey
WIDER	World Institute for Development Economics Research

1 MOTIVATION AND OBJECTIVES

1.1 Background of the study

The World Development Report 2008 "Agriculture for Development" emphasised a comprehensive approach to reduce the high rural-urban income disparities prevalent in transforming countries. The proposed pathways include farming on the own farm or as farm labourer, wage- or self-employment in the rural or urban non-farm sector and migration as well as combinations of these pathways (The World Bank, 2007). The report addresses the current needs of countries in Southeast Asia which, in the course of continued economic growth, have undergone a series of parallel changes which are referred to in the literature as "rural-urban transformation", "de-agrarianisation", "agrarian transformation", "agrarian transition" or "agrarian change" (e.g. Bryceson, 1996; Fegan, Ghee, Hart, Turton, & White, 1992; Henderson & Wang, 2005; Rigg, Salamanca, & Parnwell, 2012).

Rural-urban transformation occurs when the rural livelihoods are no longer purely dependent on farming, farm sizes decrease and occupations and income sources of rural households diversify for income growth and risk reduction (e.g. Cherdchuchai & Otsuka, 2006; Rigg, 2001, 2006). This has been observed in a study over a 25-year period of two villages in northeast Thailand where Rigg, Salamanca, and Parnwell (2012) found that households were increasingly engaged in a wide range of non-farm activities while the importance of farm-labour declined. In support of the concept of rural-urban transformation, the study of Estudillo and Hossain (2003) in three rice-growing villages in the Philippines revealed that land is much more unequally distributed among the village households than household income. This finding underlines the growing importance of non-farm activities as income source in order to compensate for the lack of land (or other assets).

The shift to off-farm employment is often accompanied with an increase in migration especially of the younger household members (e.g. Bryant & Gray, 2005; Skeldon, 1997). Migration can involve seasonal movements for a couple of months to overcome the slack period of the agricultural cycle, movements over longer time periods or some sort of commuting where the migrant travels shorter distances to a job nearby and returns nearly every evening. Migration can be to other rural or urban areas inside or outside the country and the migration pattern can be temporary or permanent, repetitive or unique (e.g. Rigg, 1988).

In the Thailand Human Development Report 2007, the consequences of the increased population mobility for rural settlements were described as follows:

> *"The basic building blocks of local society have taken a terrible beating. Old customs of shared labour and other forms of local exchange disappeared within a couple of decades of the intensifying of market agriculture. As the income from agriculture declined and the demand for urban labour increased, more and more rural families survived by sending their youth to the city (or overseas) from where they could remit some supplementary income. Families are scattered by migration. Village populations are hollowed out, with mainly young and old, and few of working age. Many children are brought up seeing their parents only for occasional visits"* (United Nations Development Programme (UNDP), 2007, p. 24).

Migration and other facets of the rural-urban transformation induce deep social and economic changes in rural villages and increase the intensity of external social and economic relations. Nonetheless, are social structures of the rural village really "hollowed out"?

Indeed, various studies confirm the formation of multi-location households, where mainly the grandchildren stay with their grandparents in the village, while the parents, who remain emotionally and economically tied to those left in the natal village, migrate outside the village. Funahashi (1996, p. 626) points at the emergence of these living arrangement in villages in northeast Thailand called "*lieng lan*" ("taking care of grandchildren") and "*lieng luk lan*" ("taking care of children and grandchildren"). Nonetheless, spatial fragmentation of households does not necessarily lead to an economic and social separation. Certainly, on the one hand, tensions and conflicts, changed worldviews, individual preferences or the opportunity to gain some social and economic independence, might lead to the social disconnection of the migrants from the natal household (e.g. Hewage, Kumara, & Rigg, 2011). However, migrants often retain strong social network ties to the village household while social integration in the destination area is often weak (Mills, 1997). Instead of establishing new social networks in the city, migrants often cluster together with others from their village in the same location and type of jobs (Rigg, 2001) so that "the destination site of migrants is in many ways an extension of village social and cultural life" (Curry & Koczberski, 1998, p. 47). Furthermore, migrants see themselves as villagers and often contribute significantly to the village household income (e.g. Funahashi, 1996; Rigg et al., 2012; Rigg & Salamanca, 2011). In times of crisis, rural-urban ties become important. Bresciani et al. (2002) for example showed that during the financial crisis in 1997 migrants in Thailand often returned to their natal households in order to deal with the shock. Households are also able to adapt to the spatial separation of their members. The social ties between village and household members are more

easily retained through improvements in transportation and communication (e.g. mobile phones). Hence, instead of a social dispersion of the household members, a modified version of the extended family is emerging (e.g. Knodel & Saengtienchai, 1999, 2007; Litwak & Kulis, 1987; Litwak, 1960; Smith, 1998).

These developments and changes in the course of the rural-urban transformation have major implications for poverty and vulnerability research. While studies on poverty focus on the measurement of static poverty levels and its determinants ex-post (e.g. J. Foster, Greer, & Thorbecke, 1984), vulnerability to poverty is a dynamic ex-ante concept that "measures the resilience against a shock – the likelihood that a shock will result in a decline in well-being" (The World Bank, 2000, p. 139) and thus takes into account the transitions in well-being over time due to negative shocks (e.g. Chaudhuri, Jalan, & Suryahadi, 2002; Christiaensen & Subbarao, 2005; Günther & Harttgen, 2009; Pritchett, Suryahadi, & Sumarto, 2000).

So far, research has been unable to fully adapt to the methodological and contextual issues that need to be addressed as a consequence of the rural-urban transformation. One reason is that the main source of data for poverty and vulnerability studies are censuses and large scale surveys which are often less flexible to adapt to the change in socio-economic conditions. For example, a restrictive household concept which focuses on nucleus household members who are in the village most of the year fails to capture the new realities of transforming village economies. It has been argued (e.g. Tacoli, 1998) that "using spatial proximity as the basis for defining the household has become increasingly … problematic as the "household space economy" has been reshaped in line with the re-shaping of household livelihood footprints" (Rigg et al., 2012, p. 1476). In line with this argument Rigg and Salamanca (2011) submit that the use of the common household definition proposed by the World Bank's Living Standards Measurement Study (LSMS) surveys (e.g. Grosh & Glewwe, 1995, 1998, 2000; Grosh & Munoz, 1996) according to which individuals who normally live and eat together ("common dwelling unit") and pool their resources ("common pot") belong to the same household, create difficulties in dealing with multi-location households. Studies who continue to apply this common household definition therefore neglect to account for the increased degree of social and economic ties to individuals outside the village and the emergence of multi-location households.

In addition, poverty and vulnerability studies often exclude variables that describe the households' social network and institutional environment (e.g. access to agricultural extension services, village institutions) and its influence on the household's coping capacity. As pointed out by Chantarat and Barrett (2007) the households' social capital can be an important complement to the households' productive assets. Since poverty and vulnerability studies rely on household samples, their ability to capture within village networks is limited.

This thesis addresses the issues which are neglected or difficult to handle in survey based poverty and vulnerability studies, namely (i) the household's institutional environment, (ii) social networks in the village and (iii) the implications of the choice of the household definition. An in-depth village case study approach that combines various data sources on different levels (e.g. a household census, a migrant and a social network survey on individual level) has been carried out in this research. Village level case studies are proposed to complement large scale surveys since they offer opportunities to gain additional knowledge about factors determining poverty and vulnerability such as migration, household behaviour including intra-household preferences and bargaining processes of the multi-location household or social network relations of various relation types (e.g. informal insurance or support, information exchange).

1.2 Research objectives

The **overall objective** of the thesis is to provide deeper insights in how social networks, migration and the households' environment relate to poverty and vulnerability in transforming countries such as Thailand. In addition, the thesis aims to make a contribution to data collection approaches in poverty and vulnerability research by developing and applying methods to collect data about social networks and migration in the context of a village case study and by testing how the definition of a household, which is the central unit of observation, impact data collection procedures, analyses and policy programmes.

The specific objectives of this thesis which are addressed in three different essays are as follows:

1) This **first essay** (chapter 4) aims to contribute to a better understanding of the role of villages in emerging market economies such as Thailand and addresses three following research questions:
   (a) to describe the socio-economic conditions of a typical rural village in Thailand including the economic activities in the village and those of migrant household members,
   (b) to compare the well-being of households whose main income source is farming with those who rely on transfer payments from their migrant household members and
   (c) to identify the effects of different macro-economic conditions on multi-location households in the context of the village case study.

2) The objective of the **second essay** (chapter 5) is to provide a better understanding of the role of social village networks for poverty and vulnerability reduction in Thailand. The detailed research questions of this paper are:
   (a) to identify the extent of social exclusion for different relation types (information, support and informal insurance networks),
   (b) to identify the pattern of multiplexity, i.e. the degree to which individuals who interact for one relation type also interact for another one and
   (c) to investigate factors that determine the formation of village information, support and informal insurance networks at the household and at the individual levels.

3) The **third essay** (chapter 6) aims to assess the implications of household definitions on the identification error when determining the target population of programme interventions under the conditions of highly mobile village populations related to rural-urban migration which is typical for emerging market economies.

1.3 Outline of the thesis

The thesis is organised in three topically related essays (chapters 4 to 6) complemented by the introductory chapter, a chapter that addresses the methodology issues arising from data collection for vulnerability to poverty studies (chapter 2) while chapter 3 explains the data collection procedure applied for the village study and in chapter 7 a synthesis is provided.

Chapter 2 introduces data collection methods for poverty and vulnerability research. Chapter 2.1 provides an overview about large scale survey and census data sets and data collection efforts by research projects which are related to the topic of the thesis. The chapter further introduces the small scale (village) case study method as an alternative method for poverty and vulnerability research and discusses the advantages and drawbacks of the two methods. In Chapter 2.2, a multiple method design will be proposed which builds on synergies between large scale surveys and small scale village case studies.

Chapter 3 introduces the procedure of the village case study in the province of Phetchaboon in Thailand, the methodological framework, including the case selection and the underlying definitions, and the data collection procedure designed to answer the research questions.

Chapter 4, 5 and 6 contain the three essays and present the results on the specific research questions.

The first essay is presented in chapter 4. It contributes to the first specific research objective as described above. The essay starts out with a brief review of migration theories (4.1) followed by a detailed description of the socio-economic conditions of the village case study including its economic activities for both village and migrant household members (4.3 and 4.4.1). Using a migration and an income model and incorporating simple social network indicators, chapter 4.4.2 presents the determinants of migration intensity and the determinants of per capita

income in order to compare between migration and agricultural-oriented livelihood strategies and its impact on the village household's well-being under different macro-economic conditions.

Chapter 5 presents the results of the second specific research objective. In chapter 5.2, the theory of networks and previous empirical network studies are reviewed. Chapter 5.3 introduces the conceptual framework and methodology and chapter 5.4 the dyadic models used to address the second specific research objective. The analyses in this chapter are based on the complete network data at the household and individual levels which are described in more detail in chapter 5.5. Chapter 5.6 offers some descriptive statistics about the extent of social exclusion and the pattern of multiplexity. Thereafter, the dyadic regression results at the household and the individual level are presented (5.7) followed by the summary and policy conclusions (5.8).

Chapter 6 investigates the relationship between targeting of rural development, poverty reduction and social protection and programmes and the choice of household definition in Asian emerging market economies and therefore addresses the third specific research objective.

Finally, in chapter 7 the findings of the study are summarised and conclusions of this study are drawn. The chapter closes with recommendations for further research.

2 DATA COLLECTION METHODS FOR POVERTY AND VULNERABILITY RESEARCH

This chapter introduces data collection methods for poverty and vulnerability research. The selected studies and methods presented here are those which were helpful in designing the data collection of this study. This chapter therefore does not aim at giving an all-embracing overview about data collection methods for poverty and vulnerability research.

The majority of poverty and vulnerability studies rely on large scale survey or census data although a few studies utilise small scale village case studies. In the following the major features of large scale surveys will be summarised, followed by the introduction of the small scale case study approach as an alternative method in poverty and vulnerability research. Thereafter, the advantages and drawbacks of both approaches will be discussed. Based on this review, a multiple method design which builds on synergies between large scale surveys and small scale village case studies will be introduced.

2.1 Large scale surveys versus small scale (village) case studies

2.1.1 Large scale surveys or censuses

Large scale survey or census data sets are the usual instrument for poverty and vulnerability research. Beside country wide living standard surveys or censuses (e.g. Thailand Population and Housing Census in Thailand, Vietnam Household Living Standard Survey in Vietnam), several research projects such as the Deutsche Forschungsgemeinschaft (DFG) Research Unit 756[1] in Thailand and Vietnam or the Nang Rong Projects[2] in Thailand have been established. These research projects often also include huge data collection efforts but are limited to smaller geographical parts of a country. A selection of surveys and censuses is provided in Appendix 1.

The aforementioned data sets are mostly long-term household panel data most valuable in poverty and vulnerability research (e.g. The World Bank, 2007). Poverty studies which are based on a single cross-section do not allow the investigation of the dynamics of poverty but

[1] See project webpage http://www.vulnerability-asia.uni-hannover.de (accessed on July 13, 2012).
[2] See project webpage http://www.cpc.unc.edu/projects/nangrong (accessed on July 13, 2012).

describe a snapshot of the households' income (or consumption) distribution. Thus, the studies lack the ability to differentiate between chronically poor households who are found to be below the poverty line over long time periods and transiently poor households who experience fluctuations in and out of poverty over time due to certain idiosyncratic or covariate shocks (e.g. Baulch & Hoddinott, 2000; Baulch & McCulloch, 2002; Duncan et al., 1993; Justino & Litchfield, 2003).

A characteristic of large scale surveys and censuses is also the number of observations. Census data normally have a higher number of observations than standard survey data since all households of the study area are covered. In contrast, a survey is limited to a sample of households which is drawn based on a sampling strategy (United Nations Department of Economic and Social Affairs (DESA), 2005). The applied sampling strategy with its different strengths and weaknesses differs among surveys, so does the sample size. The Thailand Household Socio-Economic Survey conducted by the National Statistical Office (NSO) had for example until 1994 a sample size of 32,000 households (HH) which was later reduced to about 16,000 households (webpage of NSO[3]). The established database of the DFG Research Unit 756 also contains panel data (2007, 2008 and 2010) of roughly 4,400 households across three provinces in northeast Thailand (Buriram, Nakhon Phanom, Ubon Ratchathani) and three in Vietnam (Ha Tinh, Thua Thien Hue, Dak Lak). The selection process of the households followed a three-stage cluster sampling design[4] (Hardeweg, Klasen, & Waibel, 2012). The Nang Rong Projects[5] which consist of seven separate projects conducted a panel census of roughly 7,300 households (1984, 1994/95 and 2000/01) in the Thai district Nang Rong in Buriram province (Rindfuss et al., 2004).

Due to the complete coverage of the population in a national census, cost and time constraints limit the number of variables included in the questionnaire as well as the frequency in which the census is conducted. The Population and Housing Census of Thailand is only conducted every ten years and the questionnaire is limited to key characteristics of the population

[3] See http://web.nso.go.th/eng/stat/socio/socio.htm (accessed on July 13, 2012).
[4] The sampling procedure differed for Thailand and Vietnam (see Hardeweg, Klasen, & Waibel, 2012 for detailed information).
[5] See project http://www.cpc.unc.edu/projects/nangrong (accessed on July 13, 2012).

(webpage of NSO[6]). In contrast, in surveys, it is feasible to apply more detailed questionnaires (DESA, 2005). The household questionnaire of the DFG Research Unit 756 was specifically designed to collect data for vulnerability and poverty assessments and contains more than 400 variables (e.g. household characteristics, income, consumption, assets, shocks, risk, agriculture, off-farm and self-employment, credit, insurance) that capture multiple components of vulnerability (Hardeweg et al., 2012).

Furthermore, large scale survey and census data collection require an a priori household definition, for which most surveys apply a definition similar to that proposed by the World Bank's LSMS surveys (e.g. Glewwe, 2000; Grosh & Glewwe, 1995; Grosh & Munoz, 1996) according to which individuals who normally live and eat together ("common dwelling unit") and pool their resources ("common pot") belong to the same household. The DFG Research Unit 756 is a notable example which tried to capture the multi-location nature of the households by the adoption of a wide (multi-location) and a nucleus household definition. However so far, almost all published papers are also based on the commonly used nucleus household definition (Klasen & Waibel, 2012).

Some projects combine a household survey or panel data with interviews on the village level, or migrant tracking or network surveys to collect additional information beside the information captured by the household survey. Both, the DFG Research Unit 756 and the Nang Rong Projects collected data about the situation at the village level (e.g. infrastructure, social problems) and included a migrant tracking survey, which is rarely done in other projects.
The DFG Research Unit 756 migrant tracking survey in 2010 was limited to the Greater Bangkok area in Thailand and to Ho Chi Minh City. Temporary migrants were identified during the parallel household interviews in the provinces. In Thailand 643 migrants out of 1,100 (Amare, Hohfeld, Jitsuchon, & Waibel, 2012), and in Vietnam 299 out of 600 were interviewed (Nguyen Duc, Raabe, & Grote, 2012). In contrast to the DFG Research Unit 756 which concentrated on temporary migrants who were still considered as household members, the Nang Rong Projects tracked about 1,900 permanent migrants from 22 out of the 51 study villages, namely those

[6] See http://web.nso.go.th/en/census/poph/cen_poph90.htm and http://web.nso.go.th/en/census/poph/cen_poph.htm (accessed on July 13, 2012).

which were part of the study households in 1984 and successor to that household in 1994/95. The interviews were limited to migrants who left to the Greater Bangkok area, to the Eastern Seaboard, to Korat, a regional city, or to the provincial capital Buriram (Rindfuss et al., 2004). Another prominent migrant tracking survey is the one carried out as part of the Kagera Health and Development Surveys (KHDS) in Tanzania. This migrant tracking survey builds on the detailed KHDS which were carried out by the World Bank and Muhimbili University College of Health Services (MUCHS) and covered 915 households who were interviewed four times between 1991 and 1994 (Beegle, De Weerdt, & Dercon, 2008). The follow-up 2004 survey aimed to interview the (new) households of all household members who belonged to any of these 915 households between 1991 and 1994 resulting in a sample size of 2,700 split-off households (Beegle, De Weerdt, & Dercon, 2006). In 2010, the resurvey was repeated as in 2004 resulting in over 3,300 traced split-off households (De Weerdt & Hirvonen, 2012).[7]

Due to the high complexity and time intensity, few large scale projects include network surveys. The Nang Rong Projects are a rare example which collected complete social household network data between village households for different relation types (e.g. kinship, agricultural support networks). Also the migrant tracking surveys include some network information. Permanent migrants were asked to report about visits, exchange of goods and remittance flows to or from their natal household and if they had contact to other migrants from their natal village in the place of destination. Furthermore, information about social networks to find employment and borrowing or lending money in the place of destination were collected. Also the projects' community survey obtained information on villagers who were sharing temples, schools, water sources, bus routes or labour with other villages (Rindfuss et al., 2004).

2.1.2 Small scale (village) case studies

Small scale (village) case studies, as opposed to large scale studies discussed in the previous chapter, are an alternative method to study poverty and vulnerability. Yin (1994, p.13) defines a case study as follows:

"1. A case study is an empirical inquiry that

- investigates a contemporary phenomenon within its real-life context, especially when

[7] See also webpage of project extension of resurvey in 2010 (here number of traced households is specified with over 4,000): http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTPROGRAMS/EXTKNOWLEDGEOFCHANGE/0,,contentMDK:23000853~pagePK:64168182~piPK:64168060~theSitePK:491543,00.html (accessed on July 13, 2012).

- the boundaries between phenomenon and context are not clearly evident. …

2. The case study inquiry

- copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
- relies on multiple sources of evidence, with data needing to converge in a triangulation fashion, and as another result
- benefits from prior development of theoretical prepositions to guide data collection and analysis".

Accordingly, the application of a case study is preferable if the researcher wants to study the case(s) in-depth by taking into account the complex conditions of the real-life context in which the case(s) is (are) embedded. Thus, the case study method is flexible and most suitable for explorative, descriptive, illustrative and explanatory research questions (Yin, 1994, 2009, 2012).

Another important feature of case study research is that it normally relies on multiple sources of qualitative and/or quantitative evidence (e.g. documents, archival records, interviews, direct observations, participant-observations) on the same topic and can thus be used to ensure the validity of findings and identify inconsistencies and measurement error in the data sources. This method is known as triangulation (e.g. Gillham, 2000; Yin, 1994, 2012).

The central step in a case study method is to define the case(s). In general the case is "a bounded entity …, but the boundary between the case and its contextual conditions – in both spatial and temporal dimensions – may be blurred" (Yin, 2012, p. 6). Cases can be on very different levels and include for example individual(s), organisation(s), event(s), village(s) or country(s).

Connected to the definition the case(s) and thus the unit(s) of analysis, is the decision between four designs (see Figure 1):

(1) a holistic single case,
(2) an embedded single case,
(3) a holistic multiple case or
(4) an embedded multiple case study design.

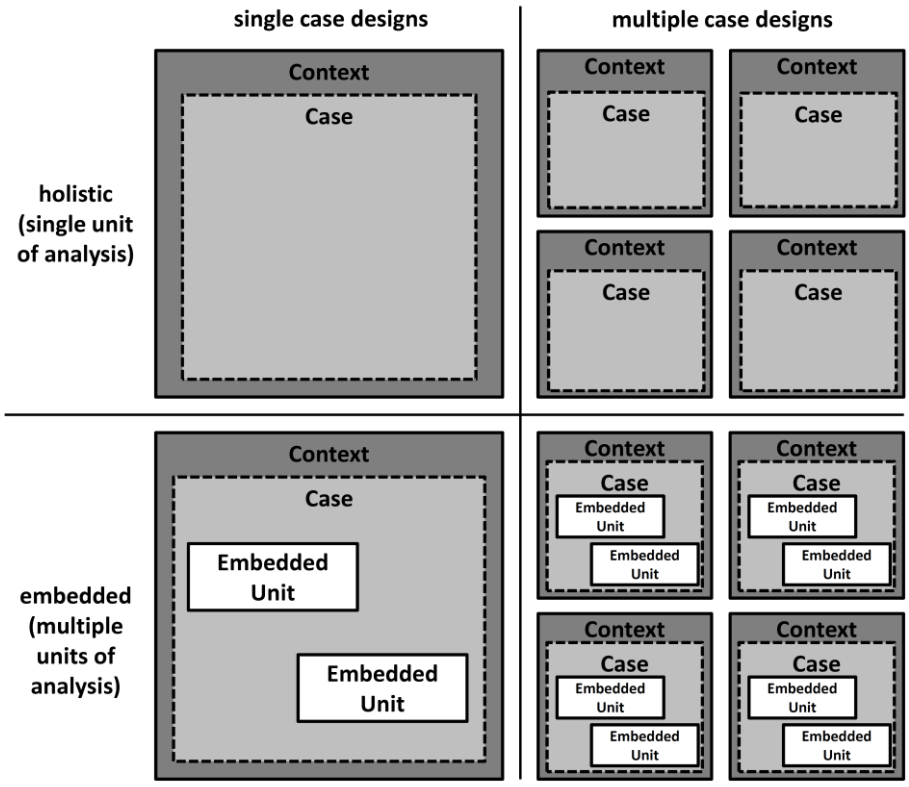

Figure 1: Types of designs for case studies

Source: Author's illustration based on COSMOS Corporation cited in Yin (2012, p. 46)

In a multiple case study design, more than one case is studied within its context while in a single case study design the focus is on one single case within its context. Each case (e.g. village) can embrace additional embedded sub-unit(s) of analysis (e.g. households, individuals). This is referred to as embedded case study design. In contrast, in the holistic case study, there is no additional sub-unit nested within the main case (Yin, 1994, 2009, 2012).

According to Yin (1994, 2009, 2012), it is rational to go for a single case study design (no matter if holistic or embedded) if the case is:

- critical,
- extreme or unique,
- representative or typical,
- revelatory and previously inaccessible or
- longitudinal, i.e. a single case which is studied at several different points in time.

In general, multiple-case studies are often preferred, though more costly and time intensive, because they are considered to produce more robust findings, increase the validity of the collected variables and thus researchers are more able to generalise their results. However, multiple case studies similar to large scale surveys require common definitions (e.g. of the

household) and data collection procedures to allow for the comparison between cases. Thus, some of the flexibility, namely to react to certain unexpected features or to refine the case if necessary, of case study research is reduced (Herriott & Firestone, 1983).

Given the research objectives, the focus will be on village case studies. Village case study designs and their implementation differ a lot from case study to case study due to differences in research objectives, context, time and financial constraints. Table 1 provides a selection of some village case studies mostly located in Southeast Asia.

Table 1: Selection of village case studies

Location	Time	Case(s)	Source
Northern Thailand (Ban Muang Wa, Ban Pa Buk)	1966-2006	2 villages	(Bruneau, 2012)
Northern Thailand (Ban Hua Nam)	1991-2009	1 village	(Wittayapak, 2012)
Northern Thailand (Mae Sa)	1976-1996	1 village	(Singhanetra-Renard, 1999)
Northeast Thailand (Ban Non Tae, Ban Tha Song Korn)	1982-2009	2 villages	(Rigg et al., 2012; Rigg & Salamanca, 2011, 2012)
Western Thailand (Nong Nae)	1984-2009	1 village	(Hirsch, 2012)
Southern Thailand (Kradang-gna, Khlong Ri, Sathing Phra)	1985-2009	3 villages	(Vandergeest, 2012)
Malaysia (Paya Keladi, Matang Pinang)	1972-2009	2 villages	(De Koninck, Rigg, & Vandergeest, 2012)
East Malaysia (Batu Lintuang, Iban settlement, Sarawak)	1979-2009	3 villages	(Cramb, 2012)
Indonesia - Java (Singgit)	1984-2009	1 village	(Peluso, Suprapto, & Purwanto, 2012)
Indonesia – Central Java (Petungkriono, Pekalongan)	1984-2009	2 villages	(Semedi, 2012)
Indonesia - Sulawesi (Lauje area)	1990-2009	1 village	(Li, 2012)
Philippines (Bunga)	1995-2009	1 village	(Kelly, 2012)
Philippines	1985-1997	3 villages	(Estudillo & Hossain, 2003; Estudillo, Sawada, & Hossain, 2005)
East Philippines	1974-1996	1 village	(Hayami, Kikuchi, & Marciano, 1998; Hayami & Kikuchi, 2000; Hayami, 1978)
Sri Lanka	2007-2008	2 villages	(Hewage et al., 2011)
Cambodia (Koh Sralao, Koh Kong)	1998-2009	1 village	(Marschke, 2012)
Northern Vietnam (Dong Hy)	1998-2009	1 village	(Scott, 2012)
Northern Vietnam (Sa Pa)	1999-2009	1 village	(Turner & Bonnin, 2012)
Tanzania – Kagera (Nyakatoke)	2000	1 village	(Comola & Fafchamps, 2010; Comola, 2008; De Weerdt & Dercon, 2006; De Weerdt & Fafchamps, 2011; De Weerdt, 2002)

Source: Author's illustration based sources listed above

Similar to large scale surveys, some village cases are also studied over longer time periods and can therefore be used to study poverty transitions and vulnerability. However, village case studies are less institutionalised than large scale surveys or censuses which are often conducted by the national statistical offices. Instead, village case studies are mostly part of

small (PhD) projects so that restudies are done less frequently (Rigg & Vandergeest, 2012). The "Challenges of the Agrarian Transition in Southeast Asia" (ChATEA) project[8] which aimed to revisit cases in Southeast Asia after 40 years is rather an exception.

Village case studies reflect the general characteristics of case studies as described above. Normally, the chosen number of village cases is small. Most multiple village case studies include at most three villages (see Table 1). Also the Nang Rong Projects discussed above could be classified as a large multiple village case study, and with its 51 study villages, would be an exception in number of villages (Rindfuss et al., 2004).

Most village case studies apply an embedded case design where the households and/or the individuals are defined as the embedded sub-units. The number of embedded sub-units is normally small. Village case studies are in general very rich in details and combine various qualitative and quantitative data collection methods to study the case and its embedded sub-units so that the village case data base is often very complex. Some researchers collect information about all households or individuals and others focus on a few households or families and describe them in greater detail. The Nyakatoke village case study in Tanzania is a prominent example in the development economic literature and includes census data of all 119 households and all 220 adults of Nyakatoke (Comola & Fafchamps, 2010; Comola, 2008; De Weerdt & Dercon, 2006; De Weerdt & Fafchamps, 2011; De Weerdt, 2002). The special focus of the Nyakatoke village case study was to study social network structures within the village which required a complete enumeration. The case study of the villages Ban Non Tae and Ban Tha Song Korn in northern Thailand was initially designed to study rice variety selection strategies. After several restudy waves (1982/83, 1994, 2008/2009), the data were intensively used to study rural-urban transformation, migration and multi-location households. The data base of this village case study contains among others a household survey of initially 81 households (sample size reduced to 77 in 2008) and in-depth, qualitative information on 15 households about their current lives, the transformation they experienced and especially the about the spatial fragmentation of the household (Rigg et al., 2012; Rigg & Salamanca, 2011, 2012). The case study of Hewage et al. (2011) in Sri Lanka which aimed to study domestic and international migration and its impact on the household included interviews with local officials, household heads and their migrants.

[8] http://catsea1.caac.umontreal.ca/ChATSEA/en/ChATSEA_Home.html (accessed on August 8, 2012).

2.1.3 Advantages and limitations of the methods

The advantages of the large scale survey method are often the drawbacks of the small scale village case studies, and vice versa. However, one should keep in mind that parts of the limitations discussed in this chapter are due to time and cost constraints.

The major concern regarding (village) case studies is the **case selection** especially if a single-case design is applied. Thus, case studies require a careful preparation and investigation of the chosen case in order to reduce the risk of misrepresentation (Yin, 2009). The questions which case study researchers need to think about carefully (and have often to answer) are: Why was especially particular site (case) chosen? What can we learn from this particular village (case) about others? Is the village (case) in a way representative and can findings be generalised? Rigg et al. (2012) claims that there is nothing like a typical village, person or any other case. And certainly, every village has its unique features which do not apply to any other village. However, there are certain trends, behaviour patterns, problems, social interactions that are typical and from which a series of hypotheses can be established and which can then be generalised to other cases. Thus, as Yin (2009) points out, case studies allow making analytic and surveys statistical generalisations.

An advantage of the survey method which is based on a proper sampling design is clearly that results can be generalised to the whole population the sample was selected from (DESA, 2008). However, a similar concern to the case selection problem in case study research can be raised over the sampling error affecting the data quality of surveys. The total survey error consists of two main components; the sampling error which arises due to interviewing a sample of the population instead of taking a census (Biemer & Lyberg, 2003); and the non-sampling error. While sampling errors can more easily be reduced by an appropriate sampling design and by increasing the sample size, non-sampling errors are harder to control for and thus usually the most significant component of total survey error (Assael & Keon, 1982; Phung Duc, Hardeweg, Praneetvatakul, & Waibel, 2012). Non-sampling errors consist of:

(1) coverage or frame errors,
(2) non-response errors,
(3) measurement errors,
(4) specification errors,
(5) processing errors and

(6) errors of estimation.

(1) The **coverage or frame error** occurs if the list (sampling frame) from which the sample is drawn omits or duplicates parts of the entire population (Biemer & Lyberg, 2003; DESA, 2008). Normally, the sampling frame used in surveys is based on secondary information sources (e.g. official village lists, registration records) which are often outdated, incomplete or simply incorrect. Unfortunately, household registration systems rely on the assumption that households are relatively static and immobile and therefore only capture permanent household movements, formations and dissolutions and not the temporary movements of individuals typical for Southeast Asia (e.g. Dang, Goldstein, & McNally, 1997; Firman, 1994; Rigg, 2001). Moreover, highly restrictive, rigid, and bureaucratic registration systems add to the tendency that individuals do not register (temporary, seasonal or permanent) changes in their place of residence (Rigg, 2001). Hence, even if sampling is done properly, the sampled population is not necessarily representative since households might occur more than once on the list or other parts of the population which are missing on the lists are underrepresented and have therefore a zero-probability to be sampled (e.g. homeless, floating population). An indication of the existence of this problem is a high replacement rate during the survey implementation in some studies. Hardeweg et al. (2012) in the DFG Research Unit 756, discussed in chapter 2.1.1, report replacement rates between 17 % and 23 % for the survey in Thailand and Vietnam. Very tight, inflexible interview schedules of large scale surveys can be another explanation of the need to substitute the originally sampled households with reserve households.[9] Small scale village case studies in contrast can adapt to these high dynamics of rural households leading to a temporary or permanent absence of certain households since enumerators can reside in the village for several days or weeks. Thus, the interview team can identify inconsistencies in the official village household lists and also react to it and therefore reduce coverage error.

Furthermore, the interview schedule of case studies can be more easily adapted to the availability of respondents and hence reduce the non-response error. (2) The **non-response error**[10] refers to the failure to obtain the desired information from the sampled population

[9] These reserve households can be (if done properly) also sampled from the given list or in the worst case just picked by the enumerators because they are available.

[10] Non-response errors comprise unit non-response and item non-response. Unit non-response refers to a situation where the sampled respondent is for some reason not interviewed at all while the latter occurs if only parts of the questionnaire are not completed or not answered by the respondent (Biemer & Lyberg, 2003; DESA, 2008).

(Biemer & Lyberg, 2003; DESA, 2008). Especially for some survey types, such as migrant tracking surveys, in which it is difficult and time consuming to find or get into contact with respondents, the number of non-responses in large surveys can become very high. Since non-responses are often concentrated at certain parts of the population (DESA, 2008) such as prostitutes, criminals, very busy or highly mobile respondents, this might lead to a underrepresentation of these groups. On the contrary, small scale village case studies less frequently miss households because enumerators can reside in a single village for extended periods of time and can accommodate the dynamics of village life. In addition by spending longer periods together with the target population in the study region, enumerators can build up trust so that they are more likely to also get contact to dodgy and transient respondents.

More time, trust, multiple sources of evidence on the same topic and longer periods in the study region enables the enumerators to go back to the respondents in cases of inconsistent or missing information can reduce measurement error. (3) The **measurement-error** refers to incorrect data caused for example by wrong answers of the respondent, a mistake of the enumerators due to unclear interviewer instructions or the expectation to receive certain answers because they influence responses or a poorly designed questionnaire (Biemer & Lyberg, 2003; DESA, 2008).

(4) The **specification error** occurs if the question in the questionnaire or how it is asked by the enumerator is different from what was intended to be measured and is therefore often caused by poor communication between the researchers responsible for different parts of the project (e.g. questionnaire development, interviews, data cleaning and analyses). (5) The **processing error** includes editing, coding or data entry errors (Biemer & Lyberg, 2003; DESA, 2008). The specification and processing error can occur in survey as well as in case study approaches. Smaller sample sizes which are normally characteristic of case studies can however reduce the risk of processing errors. Similarly, smaller research teams which are more likely in small scale case studies can lead to fewer specification errors. (6) The **error of estimation** is related to a wrong calculation of the sampling weights (Biemer & Lyberg, 2003; DESA, 2008) and is therefore survey specific and can only be problematic in case study research if a survey is part of the used data.

Another methodological challenge for the survey as well as the case study research method is the **definition of the social unit** under study. Large scale surveys and censuses as well as case study research demands a definition of the social unit under study as basis for data collection and analysis. In micro-economic theory, the household is normally considered as the basic decision-making unit (e.g. Bourguignon & Chiappori, 1992) and thus mostly seen as the key social unit under study and therefore the major survey component in the vast majority of studies in rural development research. The household definitions which are applied for data collection and analyses of large scale studies are mostly fixed ex-ante and thus underlie certain assumptions and criteria how the household appears (Russell, 1993), such as the established "common pot" and "common dwelling" household definition (e.g. Glewwe, 2000; Grosh & Glewwe, 1995; Grosh & Munoz, 1996; M. Johnson, Round, & McKay, 1990; United Nations Department of Economic and Social Affairs (DESA), 2004; United Nations Economic Commission for Europe (UNECE), Food and Agriculture Organization of the United Nations (FAO), Organisation for Economic Co-operation and Development (OECD), & The World Bank, 2007; United Nations National Household Survey Capability Programme (NHSCP), 1989). Household information is collected and analysed according the household definition. The definition therefore strongly influences the results which in turn are more likely to approve the a priori assumptions on the household. Russell (1993) highlights the risk embedded in this circularity especially since household arrangements might change over time. In addition, he points out that an inappropriate household definition can lead to wrong results and conclusions also for policy programmes. To make sure that the chosen definitions match the current situation in the studied setting and thus reduce coverage, specification or measurement errors, village case studies can be a good explorative tool and valuable complement to large scale studies which are in need of ex-ante assumptions to manage large sample sizes in a reasonable time and to a defensible budget. Village case studies have the advantage to be more flexible and allow applying and testing different household definitions to find out which definition is appropriate.

As a further advantage, case studies rely on multiple data sources and more detailed questionnaires and thus a higher number of different variables. Therefore, topics can be studied in greater detail and depth so that researchers can understand the complexity of the studied phenomenon. As demanded by several researchers (e.g. Bourguignon & Chiappori, 1992; Browning, Chiappori, & Lechene, 2006), interviews on a household and individual level

allow researchers to account for individual preferences, intra-household power relations, allocations, bargaining or decision making processes. Moreover, the elaboration of social networks can only be carried out on small samples because the complexity of the network grows exponentially. Case studies therefore sometimes help to identify certain changes or trends overseen by large scale studies (e.g. Rigg, 2001). Thus also in general, surveys are due to bigger sample size, the ex-ante assumptions which have to made and the inflexibility coming along with it, rather a tool to verify previous results while during case studies approaches the discovery of new phenomenon is more likely (Gable, 1994).

In summary, the choice between a large survey method and a small scale village case study method is a trade-off between choosing a bigger sample size and being able to easily generalise the results versus a higher flexibility and contextual depth as well as a smaller non-sampling error due to higher response rates and more accurate responses.

2.2 A multiple methods design for poverty and vulnerability research

The methodological framework for poverty and vulnerability research which is proposed here is a multiple methods design[11] which builds on synergies between large scale surveys and small scale village case studies and thus offsets the weaknesses of the two methods if they are applied separately. Multiple methods research in general, although not new, experienced a growing attention in the recent years and mostly refers to a combination of qualitative and quantitative research methods and thus makes use of advantages associated with triangulation (e.g. Creswell & Plano-Clark, 2007; R. B. Johnson, Onwuegbuzie, & Turner, 2007; R. B. Johnson & Onwuegbuzie, 2004). Yin (2006) who also argues that a multiple methods design can also embrace all other mixtures of research methods in order to study the same phenomenon. The potential of each mixture and thus the choice of the optimal combination depends on the research objectives.

[11] The method is also refered to as mixed method design (e.g. Creswell & Plano-Clark, 2007; R. B. Johnson, Onwuegbuzie, & Turner, 2007; R. B. Johnson & Onwuegbuzie, 2004; Yin, 2009).

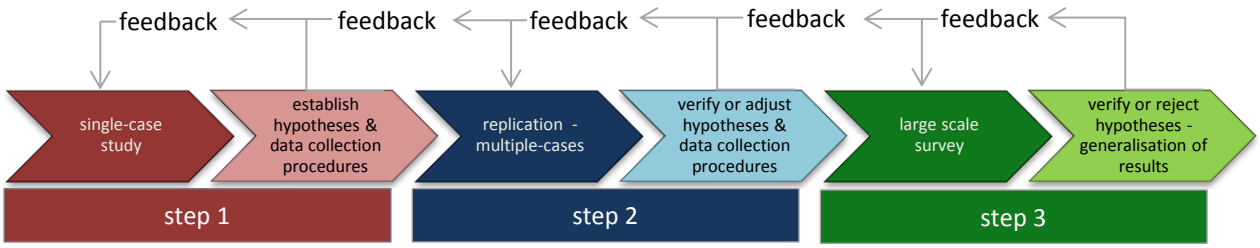

Figure 2: Steps of a multiple methods design

Source: Author's illustration

Various modifications of a multiple methods design are imaginable. Figure 2 depicts one possible design which appreciates the trade-off between small scale case studies and large scale surveys stressed in the previous chapter and the high potential of combining these two methods. Here, the village case study can be seen as a pilot study in order to test certain data collection procedures (e.g. migrant tracking survey or social network interviews), to investigate the real-life conditions in greater detail and identify relevant topics, variables and problems or to establish the needed definitions (e.g. of the household) which have to be fixed ex-ante in large scale surveys. This multiple methods design involves the following three sequential steps[12] and possible feedback loops:

(1) In the first step a single-case design of one village is applied. The aim of this first step is to establish a series of hypotheses by taking into account the real-world context of village life particularly concerning the multi-location household, poverty and migration patterns as well as support and insurance networks at the household and individual levels. This step can also be used to test data collection procedures needed to study these topics.

(2) In the second step, the established hypotheses and data collection procedures are replicated in order to either verify or to reject and adjust the results of the first village case study. Hence, the same data collection procedure(s) is(are) applied to (a) very similar village(s) or to (a) village(s) which differ(s) in certain characteristics, to test if or which parts of the results can be repeated and can hence be considered as robust (Yin, 2009).

(3) In the third step, the parts of the data collection (e.g. household level interviews and migrant tracking survey) and analyses which are relevant for the given research question are

[12] It is of course also possible that a certain step is not necessary for a given research question or because of time or budget constraints.

duplicated with a large sample size to test whether the hypotheses established in the case studies can be generalised to a larger population. While in the village case studies of step (1) and (2), the whole village population of one or more village(s) is (are) studied, in the survey method, only a sample of households is drawn from several villages. Accordingly, not all sources of evidence on which the village case study approaches rely can be investigated in the large scale survey. Nevertheless, since the design of the large scale survey relies on the experiences of the in-depth case studies, several sources of sampling and non-sampling errors discussed in chapter 2.1.3 can be reduced.

An alternative design of such a multiple methods approach is a nested arrangement where a large scale survey is complemented by a single- or multiple- (village) case study or vice versa (e.g. Yin, 2009). In the former case, one or more households or villages which are part of the sample could be investigated in greater detail. An alternative nested arrangement can refer to a design where a survey is one source of evidence used in the village case study.

3 PROCEDURE OF THE VILLAGE CASE STUDY

The implementation and analyses presented in this thesis is concentrated on the first step - the village case study - of the proposed multiple methods design depicted in i.e. Figure 2. Alternatively, this village case study can also be seen as a separate complete approach with all the advantages and limitations discussed in chapter 2.1.3. In the following, the procedure of the village case study in the province of Phetchaboon in Thailand, the methodological framework, including the case selection and the underlying definitions, and the data collection procedure designed to answer the research questions are described.

3.1 Methodological framework of the village case study

Given the research objectives, an embedded single case study design was chosen. The case is defined as one rural village and the embedded sub-units are the households and the individuals of that village. The underlying rationale to choose a single-case design is a twofold and in line with Yin (1994, 2009, 2012): first, the village case shall capture typical village characteristics and conditions and second the village case is studied at several points in time (longitudinal case).

The selected case is the village Sab Jaroen in Chon Daen district in the province Phetchaboon (see Appendix 2, Appendix 3 and Appendix 4), some 350 km north of Bangkok. The village was selected with the support of officials from the Department of Agricultural Extension (DOAE). It is located in a mountainous terrain in a heavily deforested area with generally poor natural production conditions. The village can be considered as typical for rural settlements in the lower north and parts of northeast Thailand. Comparing village characteristics such as household income, population, family size and age structure of the village case with the mean values of the district and the province shows that the village reflect typical characteristics of the province (Ministry of Interior (MOI), 2005). Also other characteristics such as the emergence of multi-location households have been found in other village case studies (e.g. Rigg & Salamanca, 2011, 2012).

As a characteristic for case studies, it was not straight forward to distinguish the case and the sub-units from the context and to define the boundaries of these units of analysis. The most

obvious **boundary definition of the case** - the village - is the geographical boundary of that village itself. However, as discussed in detail in the previous chapters the household space economy has reshaped in a way that the definition of the household has a strong influence on the definition of the village boundary. Many households are multi-location so that the individuals who belong to these households are temporarily located outside the geographical boundary of the village. Hence, the geographical village boundary is not necessarily the boundary of the village case. Therefore, the boundary has to be extended to those places where the temporary migrants are located.

The starting point to determine which households belong to the village Sab Jaroen was nevertheless its geographical village boundary as defined by the available village list and map. Accordingly, the population size (N_{HH}) is defined as all households located in the village and/or who own or rent a house within the geographical village boundary. In addition, homeless households present in the village would also be considered as part of the village, however there were none present in the village.

Beside the boundary definition of the village, the definition for the household definition and thus the **embedded sub-unit** had to be set. Given the uncertainty and the emergence of multi-location households, it was necessary to allow for the flexibility to adjust the household definition ex-post. Therefore, the household questionnaire included questions to collect information about the criteria commonly used to define the household (e.g. time spent in the household, location, relation to household head) for every individual. In addition, a very wide subjective household definition by asking the household head to name all individuals belonging to the household in the reference period was applied. Thus, the household head was able to define 'belonging to the household' himself, rather than being defined by the researcher.

This subjective household definition has the advantage that it accounts for the individuals' identity since household members identify themselves with the other household members and consider themselves as part of this group. Scholars such as Akerlof and Kranton (2000) stressed that identity is an important factor determining behaviour, economic outcomes and individual interactions and is thus important for poverty and social network analysis. Thus, this wide subjective multi-location household definition captures all individuals of a household which are involved in or influence the decision making process (concerning individual members' activities for instance) of the household. According to the New Economics of Labour Migration, also the

migration decision is made collectively by the household in order to improve overall household well-being and to diversify household risk (e.g. Rosenzweig & Stark, 1989; Stark & Levhari, 1982; Taylor & Fletcher, 2007).

Several authors however criticised the assumption that the household as a whole is considered to be a collective decision making unit but instead demand to account for the self-interests and personal objectives of the household members (e.g. Bourguignon & Chiappori, 1992; Browning et al., 2006; Chiappori, Haddad, Hoddinott, & Kanbur, 1993). Thus, "the challenge in the empirical exploration of the household is to collect information that, in some way, recognizes individual and collective scales of action in households" (Preston, 1994, p. 207).

To also account for the individuality of household members, this village case study includes the individual as embedded sub-unit.

3.2 Data collection

The data collection of this village case study relies on several different qualitative and quantitative complementary sources of evidence and thus can make use of advantages associated with triangulation. The chosen mix of data sources was motivated by the data needed to answer the research questions and aimed to collect data on province, district, village, household and individual level.

The data collection started in 2007 and was implemented in several steps. Table 2 gives an overview of the different sources of evidence which have been collected about the context, the village case itself and the two embedded sub-units: the household and the individuals.

As a first step, an explorative visit was carried out in September 2007 together with officials of the DOAE. This was necessary in order to obtain permission from the village authorities to conduct such an intensive case study and to establish the basis for follow-up data collections. This trip included visits of several provincial, district and village level institutions in order to collect information about the context of the village. At the provincial level the agricultural office, the provincial non-formal adult education centre, the provincial health department and the provincial police headquarters were visited. At the district level representatives of the district agricultural office, the Bank of Agriculture and Agricultural Cooperatives (BAAC), the district hospital and the district police were contacted. Finally, at the village level the village

headman, director of the village school and a group of villagers were interviewed during a luncheon organised by the village headman and the director of the village school.

Table 2: Multiple sources of evidence by date of data collection

2007	
Context	province level: • interviews with representatives of the agricultural office, the provincial non-formal adult education centre, the provincial health department & the provincial police headquarter with semi-structured questionnaires district level: • Interviews with representatives of the agricultural office, BAAC, the district hospital & the district police with semi-structured questionnaires
Case: village	• village list • group discussion with village headman, director of village school & group of villagers
2008	
Context	• secondary statistics
Case: village	• updated village list, map & other village documents and protocols (MLG, 1995-2009)[13] • interviews with village headman, 6 village sub-group (cluster) leaders & director of village school with semi-structured questionnaires
Sub-unit: HH	• HH census (67 HH in May/June & 6 in October) with structured questionnaires • information about absent HH
Sub-unit: individual	• parts of the HH census refer to the individuals
2009	
Context	• secondary statistics
Case: village	• updated village list, map & other village documents and protocols (MLG, 1995-2009)
Sub-unit: HH	• HH panel interviews (70 HH) with structured questionnaire • village fund records
Sub-unit: individual	• parts of the HH panel interviews refer to the individuals • social network interviews (216 individuals - 95 %) • migrant interviews (76 individuals – 84 %)

Source: Author's illustration

The following steps comprised two waves of primary data collection in 2008 and 2009. In the first wave, the reference period was defined between May 2007 and April 2008 and in the second wave between May 2008 and April 2009.

Prior to the first wave in May/June 2008 several information sources about the village population were available:

a) a village map provided by Phetchaboon's Agricultural and Cooperatives Provincial Office and Department of Public Highway, Ministry of Communication and

[13] A detailed list is provided in Appendix 5.

b) a village list compiled by the village headman who on behalf of the Local Administration Department of the Ministry of Interior reports annual changes in the village population.

To make sure that no household was missed or not existent due to possible inconsistencies of the village list or map, the list was checked and adjusted before the interviews started. The updated map of the village can be found in Appendix 6.

Based on this updated village list, a household village census was conducted. In May/June 2008, the household heads of 67 households were interviewed using a very detailed questionnaire. The questionnaire comprised sections on:

1) general information about the households and its members (income generating activities, consumption, education, health, household dynamics, risks and shocks, agriculture, off- and non-farm self-employment, borrowing and lending, public transfers, insurance, assets and housing),
2) information on the ties between household members and meso/macro organisations (e.g. schools, socio-political organisations, health facilities, companies, social security or other government organisations, insurance companies or banks) and
3) information on the social network ties between household members to other individuals that have either a private (neighbours, friends, relatives), a business (employees, employers, the doctor) or a private and business relationship to the household members.

The conduct of the household census was successful, only two out of 75 present households refused to be interviewed. Furthermore, the village headman, the director of the village elementary school and the leaders responsible for the six administrative sub-groups of households in the village (called clusters) had been interviewed. Further observations had been documented which were useful in the process of cleaning and interpreting the data. Updated versions of the village list and map and reasons for inconsistencies were compiled. Also interesting stories of the village life as well as pictures and available documents were collected. In October 2008, six additional households which had been absent during the first phase of data collection were interviewed with the same questionnaire as in May/June.

The data collection of the second wave in May/June 2009 comprised

1) household panel interviews aiming to collect information about all households interviewed in the first wave,
2) social network interviews at the individual level of all household members aged at least 14 years including those who migrated to other areas and
3) a migrant tracking survey of all migrant household members.

At the household level, a total of 70 households were interviewed using a slightly shortened version of the questionnaire from the first wave. 69 of these households were the same as in 2008. One additional household was included because one of the households split at the beginning of the reference period into two. Four households interviewed in wave one had to be dropped due to reasons of death, relocation and unwillingness to be interviewed.

The design of data collection on social networks was adjusted after the first wave. In the first wave, information about social network ties of the household was collected by asking the household head about these ties. The results of this data collection however revealed that out of the 884 named network partners 638 were located most of the year in the village. This result gave some indication that the household head was not able to give information on the ties of migrant household members. Also personal observations during the household interviews in the first wave suggested that the given answers of the household head about the household's social network ties were her personal ties rather than those of all household members, and therefore provided an incomplete picture of the multi-location households' social network. Based on these investigations in the first wave, in the second wave individual data were collected for everybody (N_P) who was at least 14 years of age and belonged to the household between May 2008 and April 2009. This also included the migrants who were considered a part of the village households by their respective household head. In total, 216 individuals (about 95 %)[14] were interviewed about their social relations: 143 individuals of them were located in the village, five were contacted by telephone and the others at their current locations which were mostly in the Greater Bangkok area (for the detailed locations of interviews see the map in Appendix 7).

[14] The total number of individuals of Sab Jaroen in the reference period of wave two was 292. The total number of individuals which were aimed to be interviewed were however only 227 because 65 had been exluded for the following reasons: 56 of them were below 14 years, two died and three left the household permanently during the reference period, and four individuals were mentally disabled and could not be interviewed.

For the migrant household members an additional questionnaire was administered to collect not only information on the migrants' social network ties but to also expand information on individual's consumption expenditures, income generating activities and living conditions. From the 90 migrants of the village, 76 were tracked down which is a relatively high quota given the nomadic nature of the migrants. These individuals sometimes move from one day to the other to a new place. In addition, the partly free transportation (a project by the government that offers free third class train tickets) facilitates these movements. Thus, migrants tend to move back and forth between the village and places where they or their relatives have a job opportunity. To keep updated about these movements in order to follow the migrants was a challenge for the interviewer team. As pointed out by many other studies (e.g. Massey, 1990a, 1990b), the strong ties among the migrants and villagers help them to find a job. Also during this migrant survey, enumerators benefited from the social network ties among the migrants who moved to the city as well as between those currently in the village. The migrants and villagers are thanks to mobile phones very well connected. The migrants which could be contacted often supported the enumerators to find out where the other individuals of the village currently were which phone number they presently have and to get in touch with them. Although the interviewer team tried to find out as much about the migrants' working schedule and other information from friends and relatives, it was often challenging to contact the migrants. Many migrants do for instance not pick up the phone if they do not know the number calling. For that reason, it was tied to contact all migrants already from the village together with their relatives. In summary, nearly every migrant was tracked down because the population of the village trusted and supported the interviewer team.

In summary, the data collection of this village case study combined features of different studies. The main data collection followed the Nyakatoke village case study in Tanzania (e.g. Comola & Fafchamps, 2010; Comola, 2008; De Weerdt & Dercon, 2006; De Weerdt, 2002) by combining a household census with separate interviews of household members about their social networks. In interviewing migrants, we applied the concept of migrant tracking surveys similar to those carried out in the Nang Rong Projects in Thailand (Rindfuss et al., 2004) and KHDS 2004 and 2010 in Tanzania (e.g. Beegle et al., 2006, 2008; The World Bank, 2004; De Weerdt & Hirvonen, 2012). The distinction of this migrant tracking survey to the two others is twofold: First, the KHDS 2004 and 2010 do not aim to collect complete network information of

all individuals of a whole village and second we tracked temporary migrants and interviewed them on individual basis immediately after the household survey. The KHDS 2004 (2010) tracking survey in contrast, is a household survey of all households in which individuals of the KHDS 1991-1994 households live. Also the Nang Rong Projects' tracking survey tracked only permanent and not temporary migrants.

4 RURAL–URBAN TRANSFORMATION, MIGRATION, ECONOMIC CRISIS AND THE VILLAGE ECONOMY

This chapter is a modified version of

Gödecke, T. and Waibel, H., 2011. Rural–urban transformation and village economy in emerging market economies during economic crisis: empirical evidence from Thailand. Cambridge Journal of Regions, Economy and Society 2011, 4(2), 205–219.[15]

4.1 Introduction and objectives

Rural villages in emerging market economies in Asia have undergone drastic changes in the course of economic development. These changes are mainly due to migration of usually the younger village members to urban industrial centres in order to diversify the household's income portfolio. This process has significant implications for the economy and social structure in rural villages. As long as agriculture was the mainstay of the economy, village activities were determined by the course of nature. Usually village institutions were strong and differences in wealth small. As younger people move to the cities, the demographic structure of a village changes and traditional village institutions tend to weaken or even break down. Another factor is that income from agriculture is replaced by remittances. The implications of this development for the well-being of village households are ambiguous. On the one hand, the growing share of off-farm income has reduced poor people's dependency on land for rural income growth (Rigg, 2006). Cherdchuchai and Otsuka (2006) showed that successes in rural poverty reduction in Thailand have been linked to the development of the rural off-farm labour market coupled with improvements of the education levels of the rural population. Hence, economic development with industrialisation mainly in the urban areas has reduced the role of rural villages as a focal point of development. On the other hand, villages can still be important especially if economic and other shocks occur. As shown by Bresciani et al. (2002) in a study of the 1997 financial crisis, in the short run commercial farmers benefited from rising commodity prices, while landless households and small-scale farmers were negatively affected as their dependence on remittances and off-farm income was high. However, when a crisis deepens

[15] Earlier versions of this chapter were presented at the SUNBELT XXX – INSNA Conference, June 29 - July 04, 2010, in Riva del Garda, Italy; at the PEGNet Conference 2010 "Policies to Foster and Sustain Equitable Development in Times of Crisis", August 02-03, 2010, in Midrand, South Africa and at the Tropentag 2010 "World food system - A contribution from Europe", August 14-16, 2010, in Zurich, Switzerland.

small-scale farm households can play a safeguarding role, once reverse migration from urban centres to rural regions takes place (Poapongsakorn, 2006).

The motivation for this paper emerges out of the need to better understand the role of villages during times of economic growth or periods of economic slowdown. We analyse factors determining the economic well-being of multi-location households using a typical village as a case study. The uniqueness of the case presented here is that a complete enumeration of all households in the village has been undertaken in 2008 and 2009 in addition to interviews with all household members in 2009. The two periods are interesting because of the economic slowdown with negative GDP growth in Thailand in the latter year (Asian Development Bank (ADB), 2010). By adopting an intensive case study approach, information could be verified through an in-depth survey process that often would be lost in large scale socio-economic surveys. The paper has three objectives:

(1) to describe the socio-economic conditions of a typical rural village in Thailand including the economic activities in the village and those of migrant household members,
(2) to compare the well-being of households whose main income source is farming with those who rely on transfer payments from their migrant household members and
(3) to identify the effects of different macro-economic conditions on multi-location households in the context of our village case study.

In the next chapter, the theory of migration is reviewed briefly and the hypotheses of the study are presented. This is followed by a description of the data collection procedure. Subsequently, the descriptive statistics and the empirical model are presented followed by some initial policy conclusion with regards to development and migration for emerging market economies.

4.2 Theoretical background

Models of migration date back to the work of Ravenstein (1885, 1889) who observed the causes and directions of migration, namely that in the course of industrialization people move from rural to urban areas primarily for economic reasons. Since then, several theoretical models have been developed that can be broadly grouped into macro migration models, micro migration models and New Economics Theories of Labour Migration (Hagen-Zanker, 2008; Massey et al., 1993).

Macro models explain migration in the context of economic development. Lewis (1954) established the hypothesis that in poor countries the supply of labour is unlimited. In his

model, a subsistence and a modern sector exist. While in the subsistence sector the marginal product of labour is zero or even negative, competitive wages exist in the modern sector. Under the condition of high population growth, a continuous movement of labour to the modern sector is facilitating industrial growth. Ranis and Fei (1961) extended this basic model by defining the subsistence sector as traditional agriculture and by formulating the interplay with the modern sector in the course of development. While maintaining the wage differential hypothesis, in this model productivity in the agricultural sector becomes a major factor for determining industrial wages.

Harris and Todaro (1970) and Todaro (1976) provided the basis for empirical migration models. Their model goes beyond the simple wage differential hypothesis by taking into account the possibility of unemployment in the modern sector. Hence, it is the expected difference rather than the actual difference in wages that drives migration.

Micro migration models (e.g. Sjaastad, 1962; Todaro & Maruszko, 1987; Todaro, 1969, 1976) provide insights into the decision making of potential migrants. Generally, migration is seen as an investment in human capital where potential migrants consider the expected discounted costs and benefits of moving to a different location. At the cost side, costs of travelling, job search and training as well as psychological costs are major factors. At the benefit side, the expected wage differential plus non-market benefits of migration (e.g. access to health) have to be considered. Discount rates reflect the time preference of the migrants and determine the present value of the net benefits of migration (e.g. Becker, 1964; Mincer, 1974; Sjaastad, 1962; Todaro, 1969).

While earlier migration models assumed the relocation of entire families (e.g. Mincer, 1978; Sandell, 1977), the New Economics of Labour Migration introduced the notion of multi-location households. While the migration decision is made collectively by the rural household, it is usually the better educated individuals who migrate to improve overall household well-being and to diversify household risk (e.g. Rosenzweig & Stark, 1989; Stark & Levhari, 1982; Taylor & Fletcher, 2007). Risks in rural areas are mostly uncorrelated or negatively correlated with those in urban areas. Migration therefore can help to co-insure the migrant and village household members against risks (e.g. Hagen-Zanker, 2008; Stark & Levhari, 1982).

Lately, the concept of social networks has entered the migration literature (e.g. Massey & España, 1987; Massey, 1990a, 1990b; Taylor, 1986). Here, interpersonal relationships among migrants as well as between migrants and their natal household members may increase the

net benefits from migration even in times of economic slowdown because of positive network externalities.

In Thailand, the integration of rural and urban development has advanced considerably. Thus, temporary and seasonal migration has become a major livelihood strategy of rural households. Hence, elements of the reviewed migration theories are helpful to derive our hypotheses. For example, the collective nature of migration decisions and the maintenance of strong ties between urban and rural household members bring the concept of multi-location households into the picture.

To better understand the role of migration for rural livelihoods, it is necessary to define the household and whom to consider as migrant. In the literature, household definitions mostly depend on the time a household member spends in the rural household. For example, the World Bank includes those persons in a household who stay there at least 90 days (Grosh & Glewwe, 1995) while the Thai National Statistics Office sets the threshold at 270 days (NSO, 2004). We defined household members as all persons, which are considered by the household head as household members regardless of their current place of living.

The definition of a migrant is complicated by the fact that especially younger household members who seek non-farm employment outside their natal village may leave and return to the household several times during the year. Hence, simply defining a migrant in terms of the days spend away from the household does not capture the true nature of migration. Thus, we defined a migrant as a person who meets the following three criteria:

(1) is considered to be a household member by the head of the rural household,
(2) is residing either in industrial zones or in an urban area for the purpose of employment or other purposes (for example, helping another migratory household member) and
(3) has been away from the village household for at least one month at the time of the interview. This short period of absence was fixed because during the period of the research the economic crisis in Thailand caused people to come back and leave again once a job opportunity emerged.

Given the background conditions of the village and confronting these with the insights that can be taken from the review of migration theories, we developed three hypotheses to be examined in this paper:

(1) The first is that migration can be explained by the household's resource endowment and its livelihood strategy. Households with a sufficient agricultural resource base and

with investments in farming will tend to rely less on migration than households with fewer prospects in the village. The latter group will take their children out of school as soon as they can find a job in the city. Idiosyncratic shocks may enhance this tendency.

(2) The second hypothesis is that migration has a positive effect on the well-being of village households as measured by household income. Although the non-farm activities gain relative importance for household well-being, we expect agricultural-oriented livelihood strategies to still have a positive income effect.

(3) The third hypothesis refers to the role of the village in times of economic crisis, as experienced in Thailand during 2008. Here, we expect that migrants rely on their natal households in times of crisis.

4.3 Village description

The study area is the village Sab Jaroen in the Phetchaboon province, some 350 km north of Bangkok. The details about the methodological framework of this study and the data collection can be found in the previous chapter 3.

The village is mainly located along a concrete provincial road and stretches over a distance of about four km. The distance to the district capital Chon Daen is 17 km and to the provincial capital Phetchaboon about 80 km. Another important centre point and source of employment for the villagers is Nong Pai, which is about 22 km away. The major type of transportation is the motorcycle which is available in nearly every household of the village. Public bus connection exists on a daily basis with a bus passing through the village with destination Bangkok. In addition, a private transportation service to the district town exists costing around 20 Baht per trip.

Public water supply is available for 80 % of the households. Electricity was introduced 15 years ago. No access to landline telephone or internet exists but around 80 % of the households have a mobile phone. In terms of public utilities the village has a primary school, two temples and two football fields.

Agriculture is the mainstay of the village economy dominated by the production of corn, cassava and mungbeans under rain-fed conditions on sloped, partially degraded land. Expansion of agricultural land is possible as deforestation continues to take place. Remaining forest areas offer the possibility to extract food and timber.

Other income activities in the village comprise urban off-farm employment in the Greater Bangkok area, small-scale business activities or employment in the chicken breeding stations of the nearby agroindustry complex, namely the 'Saha Farms' in Nong Pai district some 22 km away from the village. Prior to the outbreak of the 'chicken flu' in 2005 some village households were engaged in chicken contract farming. The loss of chicken from 'chicken flu' may have put some households into debt.[16] Saha Farms also maintain large-scale chicken feed production capacities in Lop Buri province, located some 80 km south of Sab Jaroen village. Some village members have been assigned by their employer to the Lop Buri factory and are therefore treated as migrants in our database.

Village institutions are strongly determined by the political system in Thailand. A village headman ("*pu jai ban*") is elected by the village committee. He oversees a range of projects, which are mainly government-driven. Actual implementation is subject to budgetary provision by the respective ministries. Table 3 provides a list of existing village institutions and projects and an assessment of their performance based on informal interviews with the village headman. Results show that with exception of the credit programmes, most institutions are dysfunctional or inactive.

Based on the village statistics, the total number of households in 2007 was 107 with a total population of 397 persons. The verified number of households and persons during the first household survey deviated as a total of 73 households with 303 persons were identified. In the panel survey in 2009, the number of households was reduced to 70 households and 292 persons due to death and household relocation.

[16] Data are unreliable as village members were reluctant to talk about this. However, evidence has been obtained indirectly through secondary information.

Table 3: Village institutions and projects

Name of project/ institution	Description	Year started	Performance assessment
Residents protection (village guards)	Village volunteers as guards to prevent crime and drug related incidences	2002	poor
Funeral group	To prepare for death ceremonies of village, members pay 10 Thai Baht/person/funeral	no information	good
Village fund I (Taksin fund)	Government savings fund; total budget one million Thai Baht; disbursed by village committee upon request by village members; all village members are eligible; maximum loan 40,000 Thai Baht, interest rate is 5 %/year; loan duration one year	2001	good
Village fund II (BAAC fund)	Fund of Bank of Agriculture and Agricultural Cooperative (BAAC), interest rate was 8 %/year, application conditions similar to village fund I	2003	good
Village credit cooperative	Purchase of 100 Thai Baht shares as pre-condition for borrowing small amounts, interest rate 2 % per month	no information	failed
Agricultural project funds	Government funds for various agricultural projects (e.g. production of ginger, bio-fertiliser), operated by village committee, villagers can apply for financial and material support	2008	fair - poor
Handicraft group	Financial support provided by sub-district administration to finance minor investment for handicraft (e.g. straw baskets for sticky rice)	2008	poor

Source: Village headman (Sitongma, personal communication, June 1, 2008) and cluster leader interviews and MLG (1995-2009)

4.4 Results

The results comprise two parts. First, we present data illustrating the characteristics of the village setting the scene for a formal investigation of the hypotheses established in this research. In the second part, two models are presented which aim to shed light on the determinants of migration and its effect on household income as well as the impact of economic slowdown on migrant behaviour.

4.4.1 Descriptive statistics

Households in Sab Jaroen village are generally small with an average number of household members of 4.15, ranging from single households to households with a maximum of 11 members. The gender ratio in the village is close to unity and 39.73 % of the households are female headed.

Monetary indicators of household well-being are consumption, income, assets and level of indebtedness. In this study, we use income and assets and the total amount borrowed based on the first survey. The resource base of households in Sab Jaroen village is best shown by the

household's asset endowment. The vast majority of households own land but average land holding is small with 14.65 rai.[17] The level of motorisation is comparable to other rural households in Thailand (Hardeweg et al., 2012). 23.29 % of the households have a pick up or car while 75.34 % of households have at least one motorcycle. Only four households own only a bicycle. Thus, the motorcycle is now the major means of transportation in rural Thailand. Moreover, consumption assets like mobile phones, refrigerators and washing machines are owned by the majority of the households.

Another indicator of household wealth is the house. About 60 % of the households live in a house with rather poor conditions, i.e. the house value is below 100,000 Thai Baht. Some households however live in well-equipped comparatively expensive houses (above 200,000 Thai Baht).

Household income was calculated for the first survey period by summing up the net income from all agricultural and non-agricultural enterprises plus non-farm wage income of household members including income earned by the migrant household members. In addition, remittances from non-household members, income from land rent and resource extraction, capital income from lending, savings, bonds, public transfers, indemnity payments, the use value of durable consumption goods and an imputed rental value of the owner-occupied dwelling were added as net income components. Costs of loans and depreciation of productive assets were deducted.[18]

Mean household income per capita was 4,344 Thai Baht per month which is well above the provincial poverty line of 1,206 Thai Baht per month per capita (National Economic and Social Development Board (NESDB), 2007). However, 25 % of the households were found to be below the poverty line which is above the provincial average (NESDB, 2008). The degree of inequality for income is reflected in Figure 3. It is shown that the income distribution is rather uneven. The Gini coefficient is 0.55 and thus slightly higher than in all of Thailand with 0.50 in 2007 (NESDB, 2008). Inequality is more pronounced when looking at land ownership. The upper 10 % of households own over half of all village land (see also Figure 4). The comparison between the two Lorenz curves for land and income suggests that the importance of land for household wealth may be declining (Rigg, 2006).

[17] 1 rai is equivalent to 0.16 ha.

[18] Unfortunately, costs of work of migrant household members (for example, transportation) could not be considered. However, information from the migrant survey of the second survey period revealed that migrants mostly live near their place of work. Thus, we can assume that this omission is negligible.

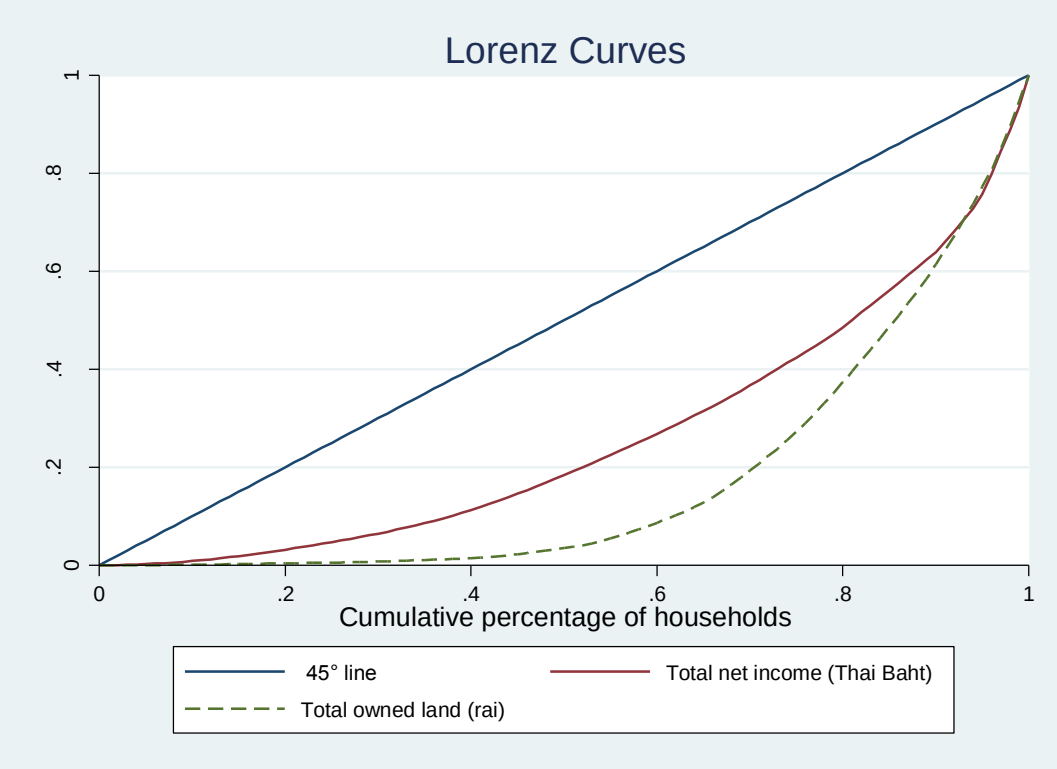

Figure 3: Distribution of total net income in Thai Baht and total owned land in rai

Source: Author's calculations based on household survey 2008

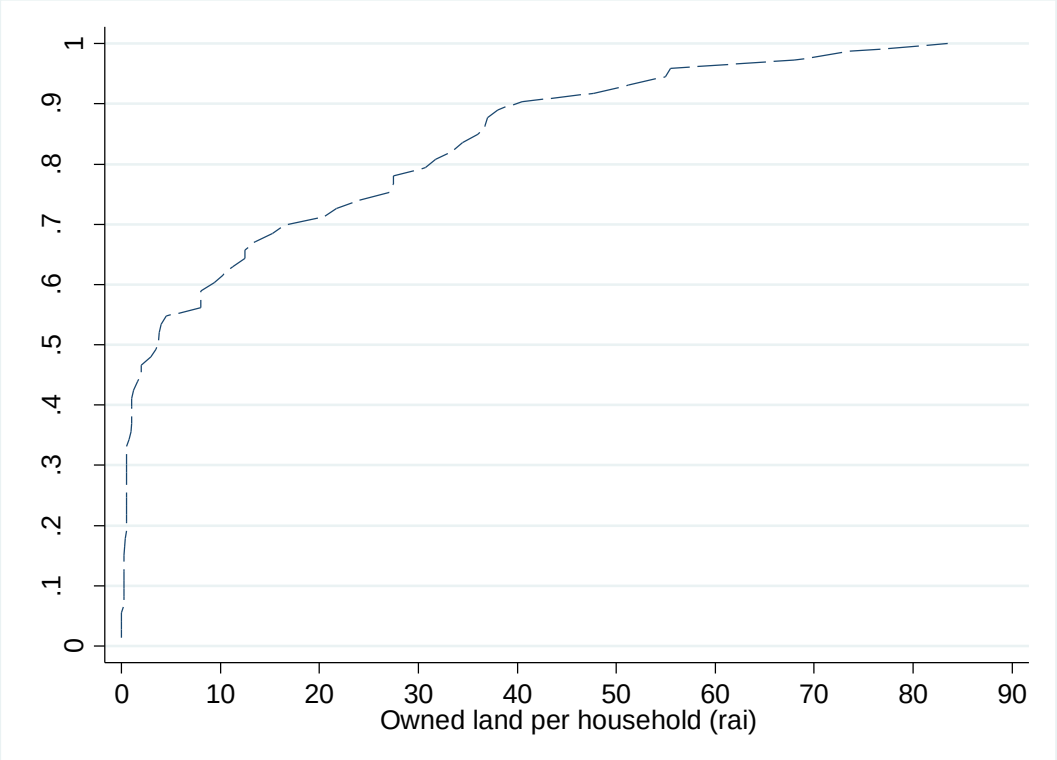

Figure 4: Cumulative distribution function of owned land per household in rai

Source: Author's calculations based on household survey 2008

Another important indicator of household wellbeing is debt. In the village, 89 % of the households borrowed. The average debt is over 20,000 Thai Baht per person, which exceeds the annual income per capita for most households. Relating debt to owned land shows a high variance. Some households' debt is exceeding the value of their land. Hence, collateral and loan repayment capacity may often be insufficient. Debt can be one factor that leads households to send their members to Bangkok for off-farm work as the last possibility to acquit their loans.

Shocks are another variable that influence livelihood strategies. Since the village is located on low-potential agricultural land with poor irrigation infrastructure, random events cause income from agriculture to vary. This may influence the decisions of the village households to adopt livelihood strategies that include migration. Table 4 shows the frequency of shocks occurred during the past five years. It becomes obvious that demographic shocks (e.g. illness, death) are dominant followed by agricultural shocks. Especially the latter suggests that agricultural prospects on the long run may be dim unless specialization in, for example, intensive livestock enterprises can be undertaken or investments in irrigation are made. Similar results from three provinces in northeast Thailand have been found by Tongruksawattana, Junge, Waibel, Revilla Diez, and Schmidt (2012).

Table 4: Types of shocks per household in per cent

Number of shocks per household	All shocks	Demographic shocks	Social shocks	Agricultural shocks	Economic shocks
None	23.29	43.84	82.19	49.32	89.04
1	15.07	26.03	15.07	34.25	6.85
2	19.18	17.81	1.37	9.59	2.74
>2	42.47	12.33	1.37	6.85	1.37

Source: Author's calculations based on household survey 2008

Poor resource endowments for agriculture, debt and shocks are among the factors that cause households to send members away for wage employment. About 60 % of the village households have at least one migrant and over one-third of the households have even two or more. The average number of migrants per household is 1.34. Migration in Sab Jaroen is mostly of temporary nature and most migrants return several times during a year. To capture the migration intensity per household, we used the sum of months household members migrated

for productive or non-productive purposes between May 2007 and April 2008.[19] Table 5 indicates that larger households tend to have more migrants.

Table 5: Duration and intensity of migration

Duration of Migration (months)	No of households	Per cent of households	Household size (mean)	Migrant month per capita (mean)
0-6	34	46.58	3.08	0.16
7-12	7	9.59	3.43	3.39
13-18	3	4.11	4.00	3.22
>18	29	39.73	5.58	6.23

Source: Author's calculations based on household survey 2008

Education is accepted as important for economic development and poverty reduction (Cherdchuchai & Otsuka, 2006). The village has its own elementary school and the headmaster of the school put the student teacher ratio at 12.5 (Manichot, 2008). However, the quality of education is poor. For example, the English teacher barely speaks any English neither does the school director. As shown in Table 6, about one-fourth of the village population above the age of 14 years did not complete their primary education and less than 3 % achieved a high school degree which is the government's formal requirement for obtaining a permanent employment contract in industry or services. Two village members achieved a university degree. Results also show that migrants tend to have more years of education than village household members and that females in general achieve higher education levels.

Table 6: Educational attainment of village members above 14 years (in years of schooling)

School years	Per cent of all household members			Per cent of migrants		
	Male	Female	Total	Male	Female	Total
None	3.45	19.38	11.84	0.00	0.00	0.00
1-4	35.34	35.66	35.51	15.38	22.86	18.39
5-6	36.21	18.60	26.94	50.00	40.00	45.98
7-9	12.07	13.95	13.06	19.23	14.29	17.24
10-12	6.03	3.88	6.53	5.77	5.71	5.75
>12	6.90	8.53	6.12	9.62	17.14	12.64

Source: Author's calculations based on household survey 2008

A major consequence of migration is the change of the age distribution of the village population. The age pyramid of the village deviates strongly from the national one. Figure 5 shows a gap in the age group between 14 to about 44 among the male population. Female

[19] Therefore, the maximum value of this variable is the number of household members multiplied by 12.

migrants start to migrate at a slightly higher age but in principle the pattern is the same. The demographic conditions of the village compare well with a sample of some 2,200 households in three provinces in Thailand (Hardeweg et al., 2012). The age structure potentially affects the village labour economy and the composition of the village institutions as mainly children and individuals of older age remain as residents in the village.

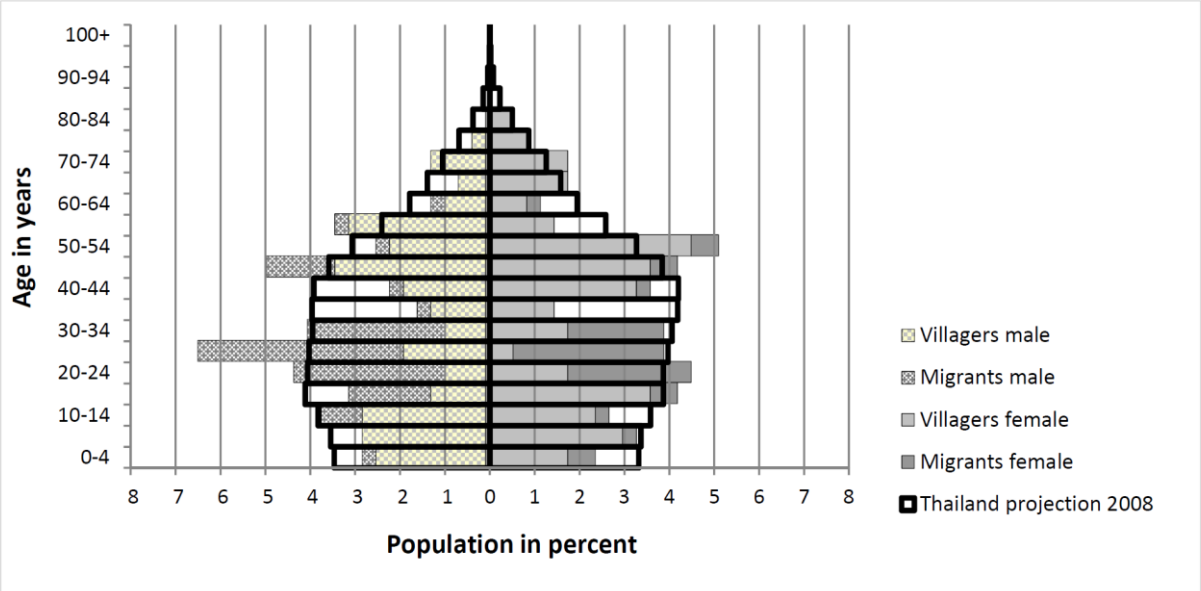

Figure 5: Age pyramid of Sab Jaroen village and Thailand

Source: Author's calculations based on household survey 2008 and Institute for Population and Social Research (2003)

In summary, the description of the socio-economic conditions which prevail in Sab Jaroen village has shown different factors that may induce households to adopt migration as a strategy improving their well-being.

4.4.2 Econometric results

Following the first two hypotheses established in the theory section of the paper, we have formulated two models in order to investigate the relationship between migration and the village household's wellbeing under different macro-economic conditions. The calculations are based on the first wave of the village household survey (see chapter 3.2). Table 7 provides summary statistics for variables included in the models. The migrant model in equation (1) specified below explains the migration intensity during the survey period:

$$Migrantmonths/capita = f(Car; Tractor; Shocks\ I; Debt/capita; SubjAss; Education; Full\text{-}Time\ farming) \quad (1)$$

In this linear OLS model, we used the number of migrant months per household member between May 2007 and April 2008 as dependent variable. This indicator is defined as the sum of total migrant month per household divided by the total number of household members. Thus, the variable values range between one and twelve month.

Table 7: Definition and descriptive summary of selected variables

Variable name	Variable definition	Mean	Standard deviation
Migrantmonths/capita	Time (in months) household members are away between May 2007 and April 2008 divided by total number of household members (range between 1 and 12)	2.91	3.15
Householdincome/capita[a]	Log of net income per capita in Thai Baht	52,131.45	99,090.64
SubjAss	Subjective estimate of respondent of the household's relative wealth position	2.45	0.85
Cropland	Size of land use for field and rice crops in rai	15.11	20.14
Car	Dummy variable, equal to 1 if household owns at least one car or pick-up	0.23	0.43
Tractor	Dummy variable, equal to 1 if household owns at least one two- or four-wheels tractor	0.21	0.41
Shocks I	Dummy variable, equal to 1 if household experienced at least one severe shock in past 5 years	0.60	0.49
Shocks II	Dummy variable, equal to 1 if household experienced at least one severe shock between May 2007 and April 2008	0.66	0.48
Debt/capita	Total amount borrowed divided by number of household members	23,171.50	29,893.68
Education	Mean of years schooling household members above 14 years	5.28	2.67
Female headed household	Dummy variable, equal to 1 if household head is female	0.40	0.49
Dependency ratio	Dependency ratio	0.37	0.76
Full Time Farming	Dummy variable, equal to 1 if household has a net income from agriculture above 20,000 Thai Baht	0.32	0.47

Notes: N=73. [a] N=71 in household income due to missing values.

Source: Author's calculations based on household survey 2008

Our first hypothesis was that migration is influenced by the household's agricultural resource base. Households with an agriculture-based livelihood orientation will tend to have fewer migrants. They will need the younger household members for family labour and offer some prospects for a competitive income in farming.

The model (see results in Table 8) confirms this hypothesis. The dummy variable for 'full-time agriculture'[20], defined through a threshold for income from agriculture, is highly significant. The tendency of this variable is also confirmed by the technology variable, that is, households who have at least one two-wheel tractor. The ownership of a tractor and the engagement in full-time farming tend to decrease migration by nearly two months. Such households had obviously made investments in agriculture, which can be taken as an indication of long-term plans and perhaps an orientation towards village life. On the other hand, it was hypothesised that households who judge their current economic well-being as 'not so bright' would tend to adopt a migration strategy. This is indicated by the variable 'subjective assessment' which measures the respondent's perception regarding the household's livelihood prospects relative to other people in Thailand. Our results are in line with the New Economics Theories of Labour Migration which submit that it is relative rather than absolute deprivation which matters for the migration decision (e.g. Skeldon, 2003; Stark & Taylor, 1989, 1991; Stark, 1984). We find that the stronger the perceived gap in well-being, the higher the tendency for migration. Our model also confirms the findings of Cherdchuchai and Otsuka (2006) who state that education is important for migration decisions. Using the average educational attainment of household members as a variable has a highly significant effect on the migration intensity. An additional year of schooling increases migration by half a month.

Three variables, which were hypothesised to be influential for the migration decision, namely the ownership of a car, household debt and shocks were not significant.

Overall, however the model is significant with a satisfactory coefficient of determination considering the nature of the data available. Results suggest that the degree to which households in Sab Jaroen village either follow a more outward-oriented migration strategy or whether they maintain a village-based agricultural strategy depends on the household's resource endowment and specific socio-economic conditions.

[20] This indicator was preferred over the size of agricultural land because hereby we capture not only activities in crop production but also livestock activities (e.g. commercial chicken farming).

Table 8: Results of migration model

	(1) Full Model	(2) Reduced Model
Car	-0.888	
	(0.545)	
Tractor	-1.915***	-2.074***
	(0.706)	(0.700)
Shock I	0.499	
	(0.878)	
Debt/capita	-0.000	
	(0.000)	
SubjAss	0.906**	0.779**
	(0.359)	(0.332)
Education	0.441***	0.413***
	(0.120)	(0.103)
Full Time Farming	-2.056***	-2.081***
	(0.668)	(0.672)
Constant	-0.601	-0.002
	(1.025)	(0.734)
R^2	0.35	0.33
R^2 adjusted	0.28	0.29
N	73	73

Notes: Robust standard errors in brackets. ***, ** and * denote significance at the 1 %, 5 % and 10 % level, respectively.

Source: Author's calculations based on household survey 2008

The second OLS model is log-linear and explores the effect of migration on village household income. The dependent variable is the logarithm of per capita income between May 2007 and April 2008. Explanatory variables are defined to capture the livelihood strategy of the household. Contributions to household income are agricultural and rural transportation activities. Hence, we included a variable that captures agricultural activities through the crop area cultivated. In addition, we used a dummy for car ownership as a proxy for business activities for which rural transportation is needed. The migration variable was hypothesised to positively contribute to rural household income. Variables with a potentially negative influence on income include the dependency ratio, the occurrence of shocks and if the household is female headed.

Hence the income model (equation 2) was specified as follows:

$$Log\ Householdincome/capita = f(Female\text{-}headed\ household;\ Dependency\ ratio;\ Migrantmonths/capita;\ Shocks\ II;\ Cropland;\ Car) \quad (2)$$

Results (see Table 9) show that the overall explanatory power of the model is satisfactory and most of the variables have the expected sign. Households with a high proportion of children

and elderly tend to have a lower per capita income. Also, the experience of a severe shock can reduce per capita income by 60 %. Migration has the expected positive and significant effect on income. Likewise, the cropping variable is significant although relatively less important than migration. An additional unit of cropland increases per capita income by 2 % while the effect of one more month of migration is four times higher.

In summary, the household income model largely confirms our second hypothesis. The model suggests that both farming and migration strategies can be successful. As shown by the migration model, the latter may be a strategy for households with a limited agricultural resource base. In times of economic progress such households may be better off through a regular flow of remittances. This however may change in times of economic slowdown. Therefore in the next step, we will investigate the implications of the economic crisis of 2008.

The economic crisis in Thailand was aggravated by the country's political problems with the one week siege of the international airport leading to a generally unstable situation. In retrospect, however, the economic slowdown did not turn out to be dramatic as the decline in Thailand's GDP was only moderate with 3.2 % in 2009 (ADB, 2009). Therefore, the hypothesised effects are difficult to discover with these data. Nevertheless, we can show some indications how the economic crisis has affected migrant households.

Table 9: Results of income model

	(1) Full Model	(2) Reduced Model
Female headed household	-0.243	
	(0.220)	
Dependency ratio	-0.327**	-0.364**
	(0.144)	(0.142)
Migrantmonth/capita	0.090***	0.085**
	(0.034)	(0.034)
Shock II	-0.596**	-0.685***
	(0.251)	(0.244)
Cropland	0.017**	0.020***
	(0.007)	(0.006)
Car	0.243	
	(0.282)	
Constant	10.319***	10.317***
	(0.264)	(0.237)
R^2	0.37	0.35
R^2 adjusted	0.31	0.31
N	71	71

Notes: Standard errors in brackets. ***, ** and * denote significance at the 1 %, 5 % and 10 % level, respectively.

Source: Author's calculations based on household survey 2008

In the social network survey conducted in 2009 (see chapter 3.2), we asked all persons individually where they could get support in case they needed money. Over 40 % of migrants reported they would only ask people from their village for support in the case of problems even though they spend most of their time away from the village. The tendency to rely on their natal village for support is even more pronounced when larger amounts of money are needed. For an amount roughly equal to the average monthly salary of a migrant almost half of the migrants in our sample would only ask village members for help. Between 10 and 19 % (help for larger amount) of migrants however said they had no one to ask for help. This indicates that some migrants might have left because of personal conflicts in their village. Overall however this simple social network indicator suggests that most migrants maintain strong social ties with their natal village and may even be reluctant to develop new networks in the urban areas. Given the high uncertainties of migrant lives in urban agglomerates this might be the best way to insure against crisis.

A further indicator that shows the connections between migrants and their village household members is reverse remittances. As shown in Table 10, only a few households had sent money between May 2007 and April 2008 to their migrants. This changed in the next year where 22 % of village households supported their migrant household members. This is also reflected in the average amount send, which doubled between the two years.

Table 10: Village household support for migrants in per cent of households

Amount (THB)	May 2007 - April 2008	May 2008 - April 2009
None	93	73
1-5,000	1	10
5,001–20,000	0	6
>20,001	6	6
Average	2,868.11	5,742.03

Notes: N=69.

Source: Author's calculations based on household surveys 2008 & 09

4.5 Summary and conclusions

This case study of a village has provided some insights in the role of rural villages under different macro-economic settings. First, rural villages in emerging market economies such as Thailand have undergone dramatic changes in the past decades. A major factor is the change in the social structure of the village as a result of out-migration of mostly younger family members to urban industrial centres as have been shown in the descriptive analysis. The increase in the dependency ratio potentially affects the village labour economy and village

institutions. Second, while in the past households relied on farming as the main source of livelihoods, to date, two major livelihood strategies have emerged. The first one is applied by those households who continue to be engaged in farming and who may have intensified their farming activities through accumulation of land and investments in agricultural technology. In addition, there are those households who seem to choose an exit strategy from agriculture or try to insure against risk in agriculture by diversifying their income portfolio through migration. These households therefore increasingly rely on wage income from household members who migrated to industrial areas. Third, according to the income model, both livelihood strategies can have their merits since migration as well as cropland was found to have a positive effect on per capita income. However, the success depends on the overall macro-economic conditions. In times of economic growth, remittances from younger migrants provide an efficient way of rewarding elder family members for raising the migrant's children in the village, for instance. Such strategy however bears considerable risk. Once the economy stalls, migrants tend to fail because of low education and poor social protection schemes. Their resource base in the city or place of work is rarely enough to cope with an economic crisis. Hence, unless they left their village due to personal conflicts, they maintain close ties with their rural family and turn back to their natal village for help as has been shown by our analysis of the connections between migrants and their village households. This is reflected by the fact that migrants often send remittances for village investment during good times and ask for financial help from villages during bad times. Our results thus support the argumentation postulated by the New Economic Theories of Labour Migration that migration serves as co-insurance of migrant and village household members by diversifying risk through labour reallocation.

Our findings raise a number of issues that deserve more attention in future research. First, rural development policies should be strongly oriented towards the actual livelihood systems of village households. For example, it is of little use if the Ministry of Agriculture offers agricultural projects subsidising part-time farming households with projects like bio-fertiliser or production of ginger. Instead, investment programmes tailored to full-time farmers would enhance the efficiency of modern agriculture and facilitate further structural change in farming. In addition and as proposed in the World Development Report 2008, programmes that support investments in labour-intensive and high-value full-time agriculture linked to the rural non-farm sector could help to generate additional rural job opportunities and therefore a complementary approach for households to diversify their income portfolio (The World Bank,

2007). Second, social protection programmes are needed that recognise the orientation of migrants to maintain their social ties with their natal village. One such measure could be the establishment of village pension funds. In addition, given the frequent occurrence of shocks current micro credits programmes could be made more need-based rather than the self-targeting emphasis as currently practiced (Menkhoff & Rungruxsirivorn, 2009). There is also a need to more critically assess the quality of education of village schools and perhaps consider the establishment of more centralised schools instead of poorly equipped village schools. Finally, the possibility to establish social village activities such as sports or cultural activities deserves more attention, especially in view of the change in village demography.

A further analysis of data collected from the second survey as well as a refinement of the models applied in this paper may provide some answers to the questions raised in this paper. Ultimately, however a longer time span of observations is necessary in order to measure changes in social and economic conditions of the village. It is therefore intended to repeat the surveys of village households and migrants after a period of perhaps five years.

5 THE ROLE OF INDIVIDUAL RELATIONS FOR HOUSEHOLD SAFETY NETS

An earlier version of this chapter was presented at the
Research Committee on Development Economics (AEL) Conference 2012
"Development Economics and Policy", June 22-23, 2012, in Bonn, Germany.

5.1 Introduction and objectives

Social networks are important for households in developing countries to cope with shocks, to deal with imperfect insurance markets (e.g. Fafchamps & Lund, 2003; Rosenzweig, 1988; Townsend, 1994) or to obtain information and advice (e.g. Bandiera & Rasul, 2006; Timothy Conley & Udry, 2001). Hence, for the design of effective social protection policies in rural areas of emerging market economies, it is important to understand the structure and functioning of social networks.

In the course of continued economic growth in Southeast Asia, rural villages have undergone dramatic changes. To achieve income growth and to reduce risk, rural livelihoods are diversifying and increasingly become delinked from agriculture (e.g. Bryceson & Jamal, 1997; Bryceson, 1996). In rural areas, farming is no longer the major income generating activity and the importance of land for household income is declining (Rigg, 2006). Instead, self-employment and off-farm activities including farm and non-farm wage employment are increasingly contributing to the income portfolio of rural households (e.g. Estudillo et al., 2005; Rigg, 2001, 2006). The shift to off-farm activities is accompanied with migration especially of younger household members to urban areas or agro-industries outside the village where job opportunities can be found. This process has significant implications for the social structure in villages, i.e. the village lost its role as "closed, cohesive, agrarian economy consisting of a group of mainly subsistence household-farmers" (Ligon, Thomas, & Worrall, 1997, p. 1). Village families transform into multi-location households with a variety of income sources. Although the permanent residents in the village are mainly the elderly and the children, migrants still consider the village as their home. They continue to invest in houses and land, send remittances to their children or older relatives. They temporarily return if they lose their job and many also plan to return when they retire. In addition, as pointed out by Stark and Levhari (1982) and Stark (1978) temporary migrants, especially those migrating from rural to urban areas, play an important role in risk-sharing arrangements.

In this study we take a novel approach that accounts for ties within and across the geographical village boundary between villagers and migrants. We especially refer to temporary migrants who, depending on job opportunities, frequently change their location. Hence, we apply a multi-location household definition and accordingly a broad village concept. To capture intra-household ties particularly between migrant household members and villagers, the analysis is performed at the household level and at the individual level. The latter can better explain network formation.

Our study object is a typical village and its entire population. Our data set contains detailed information on income, employment and location for all households in 2008 and 2009. In addition, social network interviews with all household members, including migrant interviews at their residences or workplaces, were carried out during 2009. In this way we are able to identify those who are connected and those who are isolated. Furthermore, we can explore whether or not actors choose each other simultaneously for different relation types (e.g. information, support and insurance networks).

The declining role of agriculture together with the enhanced importance of off-farm income suggests that new relation types are becoming essential for rural areas. While in the past agricultural information and support networks were dominant, now information about job opportunities outside agriculture is becoming important. Moreover, households are exposed to multiple risks stemming from agriculture, off-farm as well as self-employment. To deal with such shocks, vulnerable households who cannot rely on formal insurance mechanisms continue to depend on informal social relations and insurance schemes (e.g. Dercon & Krishnan, 2003; Hoddinott, Dercon, & Krishnan, 2005; Townsend, 1995).

The overall objective of the paper is to better understand the role of social village networks for the reduction of poverty and vulnerability. We have three specific objectives:

(1) to identify the extent of social exclusion for different relation types (information, support and insurance networks),
(2) to identify the pattern of multiplexity, i.e. the degree to which individuals who interact for one relation type also interact for another one and
(3) to investigate factors that determine the formation of village information, support and insurance networks at the household and at the individual levels. Here, we specifically want to explore the pattern of homophily, i.e. similarities of the network partners by

accounting for intra-village ties and those beyond the geographical village boundary between migrant household members and villagers.

Objectives (3) is the core contribution towards a better understanding of village networks while objectives (1) and (2) are complimentary information to describe the nature of the networks.

In the next chapter, the theory of networks and previous empirical studies are reviewed and, based on the relevant literature, hypotheses are formulated. In chapter 5.3 we present the conceptual framework and methodology and in chapter 5.4 the empirical model. Chapter 5.5 introduces the data and chapter 5.6 offers some descriptive statistics about social exclusion and multiplexity. Thereafter, the dyadic regression results at the household and the individual level are presented followed by the summary and policy conclusions.

5.2 Literature review: Networks in economic development

"A network consists of a set of actors or nodes along with a set of ties of a specific type that link them" (Borgatti & Halgin, 2011, p. 2). The theory of networks explores why networks have the structures they do; respective models use network properties as the dependent variable (Borgatti & Halgin, 2011; Borgatti & Lopez-Kidwell, 2011).

In a seminal paper on network formation, Jackson and Wolinsky (1996) show that self-interested actors themselves decide to establish, maintain or sever ties with other actors based on a cost-benefit analysis of each tie. Jackson and Wolinsky's (1996) concept of pairwise stability is a simple way to capture this principle. A network is pairwise stable if "no pair of individuals wants to form a link that is not present and no individual gains by severing a link that is present" (Dutta & Jackson, 2003, p. 6). Jackson and Wolinsky (1996) argue that the benefits of a tie are higher the shorter the path between the two actors (geodesic distance[21]). The authors show that direct ties are, however, more costly and that stable networks are not necessarily efficient.

C. Johnson and Gilles' (2000) spatial connections model shows that the costs of network formation decrease the closer the actors are located to each other. Akerlof (1997) presents a model of social distance where similar to their geographic location; individuals occupy different

[21] Geodesic distance "between two households is the minimum amount of steps one has to take to go from one household to the other on the network graph" (De Weerdt, 2002, p. 4).

positions in the social space. Akerlof (1997) argues that individuals interact less if they are socially distant.

The underlying behavioural assumption for our empirical analysis is presented in equation (1) (e.g. Fafchamps & Gubert, 2007a, 2007b; Santos & Barrett, 2010):

$$T_{\text{ijk}} = \begin{cases} 1 \; if \; B_k(d_{ij}) - C_k(d_{ij}) \geq 0 \\ 0 \; otherwise \end{cases} \quad (1)$$

where $B_k(°)$ represents the benefits and $C_k(°)$ the costs of the tie T_{ijk} between actor "i" and "j" for relation type k. The costs and benefits depend on the distance d_{ij} between "i" and "j" which can be interpreted as (i) geodesic distance, (ii) geographic distance or (iii) social distance. The latter is of particular interest and captures differences in observable characteristics of networks partners, i.e. family relatedness, economic activities, similar age or gender. T_{ijk} equals 1 if the benefits exceed the costs and thus the tie between "i" and "j" is formed, and 0 otherwise.

Based on this framework, patterns of homophily can be analysed. Homophily is the tendency that individuals are more likely to form relationships with individuals that have similar attributes or characteristics (e.g. McPherson, Smith-Lovin, & Cook, 2001).

Empirical studies of network formation often focus on risk-sharing networks (Santos & Barrett, 2007). As shown in numerous studies in developing countries, individuals or households compensate for the lack of formal insurance arrangements by helping each other in case of shocks or risks (e.g. Bramoulle & Kranton, 2005; Fafchamps & Lund, 2003; Fafchamps, 1992; A. D. Foster & Rosenzweig, 2001; Ligon et al., 1997; Ligon, Thomas, & Worrall, 2002; Ravallion & Coate, 1993; Rosenzweig, 1988; Townsend, 1994). Informal credit arrangements between households and transfers are the major channels of risk-sharing (e.g. Bhattamishra & Barrett, 2008; Fafchamps & Gubert, 2007a; Udry, 1994).

Fafchamps and Gubert (2007a) use a random sample of 206 households from four villages in the rural Philippines to study the determinants of borrowing networks and exchange of gifts networks. They find that geographic proximity, age and wealth differences are the major determinants of risk-sharing networks. In addition, they observe that income correlation and differences in occupation between the household pairs which are expected to increase the

benefits of the risk-sharing arrangement since households with different income sources are less likely to be affected by the same covariate shock have no impact on tie formation.

De Weerdt and Dercon (2006) show that risk-sharing was the major coping strategy of households in a Tanzanian village for the two major shocks during the past ten years. De Weerdt (2002) finds that the major determinants for the formation of hypothetical risk-sharing arrangements for cash and labour were kinship, geographic proximity, religious affiliation, clan membership, wealth and the number of common friends. In addition, he finds that the richer the household in terms of assets, the denser the network of that household. Comola (2008) who bases her analysis on the same data as De Weerdt (2002) points out that also the wealth and position of indirect contacts (e.g. a friend of a friend) matter for network formation. Households seem to "prefer rich partners, but with fewer and/or poorer contacts" (Comola, 2008, p. 16).

Using network data of four resettlement villages in Zimbabwe, Dekker (2004) investigates the determinants of actual intra-village risk-sharing networks in response to major shocks. Results show that households were more likely to provide assistance to households with whom they shared a past before or during resettlement (through e.g. previous insurance arrangements, kinship relations, geographical origin). Thus, social relations established after resettlement play a weaker role. In most villages, the membership in different associations was identified as an additional determinant. The kind of association important to network formation was village-specific.

Santos and Barrett (2011) study the determinants of Ethiopian pastoralists' willingness to lend cattle to others. They find that "middle class" households are preferred as lenders, while the poorest and richest households are excluded. Furthermore, they show that the likelihood of such an informal credit arrangement increases if (i) both households belong to the same clan, (ii) the lender is older and (iii) the borrower is male. While geographical distance was not statistically significant, expected gains from receiving a loan increased the likelihood to obtain that loan and the probability of being wealthy enough for repayment decreased the likelihood.

Santos and Barrett (2011) analyse the determinants of tie formation between households to receive advice on agricultural technologies in four Ghanaian villages. They find that shared clan membership and the migration status of households have no impact on the formation of the information network, while gender differences, experience in specific crops and land ownership do.

This literature review gives rise to the following three hypotheses:

(1) Kinship, friendship and being part of the same household are the major determinants of network formation.

(2) Geographic proximity increases the likelihood of a tie due to lower costs of establishing or maintaining a tie. Thus, at the individual level migrants are expected to link with other migrants and villagers with other villagers. While in line with hypothesis (1), villagers and migrants that belong to the same household help each other.

(3) Differences in wealth measured by assets are important determinants while income is not.

5.3 Conceptual framework and methodology

In the study village, the declining role of agriculture, migration and the emergence of multi-location households complicate the definition of the population size (N) and therefore the specification of the network boundary[22]. A common assumption in the literature (e.g. Fafchamps & Gubert, 2007a) is that especially insurance networks are centred at the village level. Thus, the most obvious definition of the network boundary of a village is the geographical boundary of that village itself. Therefore, the population size (N_{HH}) is defined as all households that are registered in the village and that have a house within the geographical village boundary. To encompass important ties across the geographical village boundary between villagers and migrants and to account for the existence of multi-location households a broad household definition and village concept were applied. Accordingly, household members are defined as all persons who are considered by the household head as household members regardless of their current place of living. Due to the multi-location nature of the household, it was unrealistic to assume that the household head could give detailed information about the ties of migrants. Thus, individual data have been collected for everybody who is 14 years or older and belongs to the village in a wider sense. This includes the migrants that are considered as part of the village households by the respective household head (N_P).

[22] For details about the boundary specification problem see for instance Borgatti and Halgin (2011), Laumann, Marsden, and Prensky (1983) or Wasserman and Faust (1994).

To account for intra-household ties, the analysis will be accomplished on two levels:

a) at the individual level (subscript P) and

b) at the household level (subscript HH).

At both levels, it is useful to subdivide the network in the smallest possible sub-unit – the dyad. "A dyad consists of a pair of actors and the (possible) tie(s) between them" (Wasserman & Faust, 1994, p. 18). In general, we will use the following notation: a dyad consisting of the actors "i" and "j" with each actor belonging to the network $N = 1, \dots, n$ can be denoted by $D_{ij} = (T_{ij}, T_{ji})$ where T_{ij} depicts the tie "i" receives from "j" and T_{ji} denotes the tie "j" receives from "i".

At the **individual level**, $D_{P;ab} = (T_{P;ab}, T_{P;ba})$ depicts the dyad between individual "a" and individual "b" and N_P is defined as all individuals that have been interviewed. Consequently, we consider all ties between individuals belonging to N_P and we exclude ties where at least one of the network partners does not belong to N_P.

At the **household level**, the dyad between household "1" and household "2" is defined as $D_{HH;12} = (T_{HH;12}, T_{HH;21})$. At the household level, the analysis is based on all households that belong to the village. Accordingly, all ties between these households are considered. To generate the ties at the household level, the reported ties by the individuals had to be aggregated. We assume that there is a tie from household "2" to household "1" ($T_{HH;12}$) if there is <u>at least</u> one tie from an individual that belongs to household "2" to an individual that belongs to household "1". Households with only intra-household ties are considered as isolates.

5.4 Empirical model

To study the determinants of the network formation between two actors empirically, we follow the literature on dyadic regressions by Fafchamps and Gubert (2007a).[23] The general dyadic regression model is shown in equation (2):

$$Y_{ijk} = \propto + \beta X_{ij} + u_{ijk} \tag{2}$$

[23] An alternative method is the Quadratic Assignment Procedure (QAP) which has for example been used by Santos and Barrett (2010) and Santos and Barrett (2011). Instead of correcting standard errors, this permutation method corrects the p-values directly. For details see Krackhardt (1987, 1988) or Hubert and Schultz (1976). Fafchamps and Gubert (2007a) pointed out that their method is statistically more efficient since it does not rely on bootstrapping.

where "i" and "j" denote again two actors, Y_{ijk} is a $\mathrm{N} \times (\mathrm{N}-1)$ matrix with the elements being 1 if "i" receives a tie from "j" for relation type k and 0 otherwise, $\mathrm{X_{ij}}$ are $\mathrm{N} \times (\mathrm{N}-1)$ matrices of the independent variables and u_{ijk} the dyadic error term. In a dyadic regression, regressors $\mathrm{X_{ij}}$ must enter the regression in a symmetric fashion. One easy way to do this in a directional dyadic model is to specify the model as in equation (3):

$$Y_{ijk} = \propto + \beta_{1k}(z_i - z_j) + \beta_{2k}(z_i + z_j) + \gamma_k w_{ij} + u_{ijk} \quad (3)$$

where w_{ij} denotes a relational attribute of the tie between "i" and "j" (e.g. geographic distance between "i" and "j" or "i" and "j" being friends or relatives) and z_i and z_j represent attributes of actor "i" and "j" respectively (e.g. income).

A problem of a dyadic regression is the estimation of the error terms. As the sampled individuals are the same across dyads, the dyadic observations are by construction dependent. Thus, it is reasonable to assume that there is a cross-observation correlation in the error terms involving similar individuals. This yields consistent coefficient estimates but inconsistent standard errors and thus leads to incorrect inference. Hence, one has to control for the effect of correlations across the unobservables. One way to obtain robust standard errors is to extend the method by Conley (1999) following Fafchamps and Gubert (2007a).[24] This also corrects for possible heteroskedasticity and for the double counting of the dyads D_{ij} and D_{ji}.

5.5 Village description and data

5.5.1 Village description

The study site is a typical village in the province Phetchaboon, some 350 km north of Bangkok. The uniqueness of this data set is the combination of a complete enumeration of all households and individuals as well as semi-structured interviews with the village headman and village sub-group (cluster) leaders. Hence, in 2008 and 2009 interviews with all 70 households of the village were conducted, using a questionnaire that includes modules on income generating activities, consumption, education, health, risks and shocks, borrowing and lending,

[24] We do so by using the Stata programme "ngreg" which can be downloaded from the homepage of Marcel Fafchamps: http://www.economics.ox.ac.uk/members/marcel.fafchamps/homepage/ (accessed on October 12, 2011).

public transfers, insurance, assets and housing. In addition to the household census, all 216 individuals aged at least 14 years including those who migrated to other areas in Thailand have been interviewed about their social networks in 2009. For a detailed description of the data collection procedure see chapter 3.

Complete coverage at the household and the individual levels is essential to investigate the determinants of intra-village networks. The household interviews and most of the social network interviews at the individual level in 2009 were done in the village. However, since about 60 % of the village households had at least one member working outside the village, we conducted many interviews elsewhere, especially in the Greater Bangkok area.

The following features characterise the village:

- high dependency ratio as a result of migration,
- poverty head count of 25 %, which is above the provincial average (NESDB, 2008),
- high income inequality with a Gini coefficient of 0.55,
- 89 % of the households are indebted,
- poor social infrastructure in the village (e.g. no health station, inefficient government projects),
- almost no job opportunities other than farming,
- households vulnerable to shocks (77 % experienced at least one shock during past five years),
- the motorcycle is the major means of transportation (75 % of households have a motorcycle while only 23 % of the households have a pick up or car),
- the majority of the households have access to a telephone (81 % have at least one mobile phone) and
- most households cannot rely on formal insurance mechanisms (18 % have no insurance at all, while the others have at the most a funeral insurance).

5.5.2 Network data

Our village data set at the household level contains all $N_{HH} = 70$ households and hence $N_{HH,D} = 70(70-1) = 4{,}830$ observations for the dyadic analysis and all $N_P = 216$ individuals who are 14 years or older and therefore $N_{P,D} = 216(216-1) = 46{,}440$ observations for the dyadic analysis at the individual level.

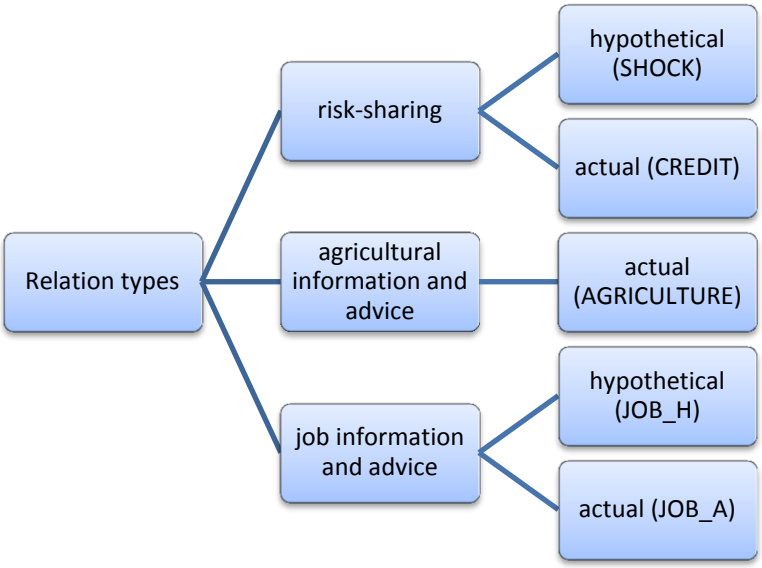

Figure 6: Relation types

Source: Author's illustration

For the analysis, we chose five different relation types: SHOCK, CREDIT, AGRICULTURE, JOB_H and JOB_A (see Figure 6). They can be associated with three livelihood activities important for the households' well-being. Including several relation types in the analysis enables us to investigate multiplexity. Such studies until to date are rare in the development economics literature.

We first investigate risk-sharing networks through two relation types. First, respondents named whom they would ask for help in case of a shock with negative monetary consequences (SHOCK) and second from whom they borrowed or to whom they lent money during the past five years (CREDIT). Third, we include relations regarding advice on agricultural issues. Individuals were asked who gave them and to whom they gave advice on agricultural issues (e.g. crop- and livestock management). Finally, we analyse two relation types regarding off-farm employment. Here, we differentiate between the actual help to find a job in the past five years (JOB_A) and the option in getting help when searching for a job in the future (JOB_H).

Our analysis is based on data with flows always directed from "j" to "i". Thus, the data are organised in a way that the first actor listed is the receiver ("i") while the second is the sender ("j"). This of course leads to the problem typical for dyadic analyses that conflicting information may occur between receiver and sender. Following De Weerdt (2004) and Comola (2008), we assume that under-reporting is more likely than over-reporting. Thus, T_{ijk} from equation (1) equals 1 if either "i" or "j" reported a flow from "j" to "i".

Our network questionnaire also included network partner attributes, relationship attributes, behavioural repertoire in the relationship (e.g. number of visits or talks on the phone) and the alter adjacency matrix of the network partners (i.e. who of the named network partners know each other). For this paper, we limit the analysis to households (N_{HH}) and individual household members (N_P) belonging to the village. This has the advantage that we need not to rely on a respondent's reporting of another individual's characteristics but can draw information from the original source.

5.6 Descriptive results

Table 11 reports those households who are isolated, i.e. they do not have any ties. Since we consider the direction of the tie, we have to distinguish between the in-degree and the out-degree. The in-degree is the number of ties per relation type a household receives from another while the out-degree refers to the number of ties the household sends to other households. Columns 1a to 1c show the per cent of households with the highest degree of isolation, i.e. those where both in-degree and out-degree are zero. Columns 2a to 2c show the per cent of households with an in-degree and columns 3a to 3c with an out-degree of zero. Also here, the village boundary specification plays a role: column (a) includes all household ties inside and outside the network boundary (as defined in section (3)). In column (b) only ties inside the network boundary are included while column (c) reports only household with ties across the network boundary.

Results show that for all relation types, there is at least one household that has no tie with households inside and outside the network boundary. For the JOB networks, up to 18.57 % of the households have no ties. In addition, for all relation types the number of isolates is higher if we only consider the ties to/from households outside the village which shows that the intra-village network has a higher density[25]. Accordingly, the percentage of households who have no tie from households inside the village (on average 33.71 %) is lower than the percentage of households who have no households to ask from outside (on average 46.28 %). The same is true for outgoing ties. On average, 36.57 % of the households do not give advice to any

[25] The density of a network refers to the ratio of the number of ties actually present in the network to the maximum number of ties that can be present (Wasserman & Faust, 1994).

household inside the network boundary while on average 63.57 % of the village households provide no help to households outside the village.

Table 11: Isolated households in per cent

	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
Ties	from & to			from			to		
	$\notin$ & $\in N_{HH}$	$\in N_{HH}$	$\notin N_{HH}$	$\notin$ & $\in N_{HH}$	$\in N_{HH}$	$\notin N_{HH}$	$\notin$ & $\in N_{HH}$	$\in N_{HH}$	$\notin N_{HH}$
Relation types									
$SHOCK_{HH}$	1.43	18.57	22.86	4.29	28.57	22.86	n/a	38.57	n/a
$CREDIT_{HH}$	8.57	22.86	42.86	27.14	41.43	62.86	25.71	40.00	54.29
$AGRICULTURE_{HH}$	7.14	11.43	35.71	11.43	15.71	45.71	15.71	21.43	67.14
JOB_H_{HH}	18.57	28.57	48.57	31.43	47.14	57.14	41.43	45.71	82.86
JOB_A_{HH}	14.29	22.86	31.43	21.43	35.71	42.86	25.71	37.14	50.00
Average	10.00	20.86	36.28	19.14	33.71	46.28	27.14	36.57	63.57

Notes: N_{HH}= 70 n/a: variable dropped since this question was not asked for $SHOCK_{HH}$ networks.

Source: Author's calculations based on social network survey 2009

Of special interest are households who do not receive any kind of support from other village members (column 2b in Table 11). We find that these households tend to be the smaller ones, are on average older and have a higher dependency ratio (see Table 12). However, their average per capita net income is higher than that of the non-isolated households, while inequality is lower in the latter group. This suggests that some of the isolated households have accumulated some wealth while others are poor. Isolated households tend to draw their income from off-farm employment rather than from agriculture. Considering that the share of household members who are not working is higher among the isolated households suggests that one reason for their isolation is the lack of involvement in employment activities which in many cases could be related to old age. It seems that in such village communities, participation decreases with their exit from the labour market. Personal observations and interviews with the village headman (Sitongma, personal communication, June 1, 2008) showed that there are no social or cultural activities except some religious ceremonies (e.g. funerals). However, for the two risk-sharing networks ($SHOCK_{HH}$ and $CREDIT_{HH}$), results show that isolated households within the village tend to be recipients of outside support. Considering all relation types, isolated households give less support to persons inside or outside the village, in comparison to non-isolated households. The observation that isolated households are wealthier points at an interesting phenomenon: those who could provide help abstain, while the poorer households are unable to do so.

Table 12: Mean household characteristics for households with and without ties

	$SHOCK_{HH}$		$CREDIT_{HH}$		$AGRICULTURE_{HH}$		JOB_H_{HH}		JOB_A_{HH}	
In-degree $\in \mathbf{N_{HH}}$	**zero**	**> zero**	**zero**	**> zero**	**zero**	**> zero**	**zero**	**> zero**	**zero**	**> zero**
Mean age of HH member (years)	41.69	36.28	40.33	36.06	46.22	36.26	39.08	36.71	40.86	36.14
Dependency ratio	0.66	0.52	0.63	0.51	0.86	0.5	0.58	0.54	0.63	0.52
Household size	3.6	4.4	4.14	4.2	3.18	4.36	4	4.32	3.8	4.38
Net income (THB):										
Per capita	45,344	39,866	43,066	40,275	42,515	41,229	49,044	34,642	53,653	34,642
From agriculture	18,945	37,197	30,145	33,281	-788	38,091	30,687	33,137	29,165	33,547
From off-farm employment	106,864	100,128	111,868	95,110	115,833	99,483	110,000	91,443	110,000	96,112
Gini coefficient	0.49	0.44	0.46	0.46	0.58	0.43	0.50	0.40	0.51	0.40
Per cent working in/as:										
Own agriculture	0.25	0.26	0.22	0.28	0.08	0.29	0.22	0.29	0.25	0.26
farm labourer	0.13	0.15	0.19	0.11	0.32	0.12	0.11	0.18	0.1	0.17
Non-farm labourer	0.21	0.22	0.16	0.25	0.15	0.23	0.23	0.2	0.18	0.24
Not working	0.18	0.12	0.19	0.10	0.22	0.12	0.2	0.08	0.23	0.08
Out-degree for respective relation type k:										
To HH $\in \mathbf{N_{HH}}$	0.85	1.28	0.79	1.49	0.55	2.63	0.67	1.19	0.6	1.91
To HH $\notin \boldsymbol{N_{HH}}$	n/a	n/a	0.76	0.83	0.55	0.81	0.09	0.51	0.92	1.07
In-degree for respective relation type k:										
From HH $\notin \mathbf{N_{HH}}$	3.15	2.3	0.72	0.54	0.55	1.08	0.55	0.68	1.04	1.42

Notes: N_{HH}= 70. n/a: variable dropped since this question was not asked for $SHOCK_{HH}$ networks.

Source: Author's calculations based on social network survey 2009 & household survey 2009

Table 13 shows the distribution of the dependent variables for the five relation types at the household and individual levels. Overall, the density of the networks is low, i.e. ranging from 1.4 % to 3.3 % at the household and 0.3 % to 0.7 % at the individual level. The highest density is found for the relation types AGRICULTURE and JOB_A at both levels. Differences in frequency rankings can be observed between household and individual levels for CREDIT and SHOCK networks (see Table 13).

Table 13: Distribution of endogenous variables at the household and individual levels

Variable	Value	Household level ($N_{HH,D}$= 4,830)		Individual level ($N_{P,D}$= 46,440)	
		Frequency	Per cent	Frequency	Per cent
SHOCK	1	81	1.68	205	0.44
	0	4,749	98.32	46,235	99.56
CREDIT	1	84	1.74	121	0.26
	0	4,746	98.26	46,319	99.74
AGRICULTURE	1	161	3.33	308	0.66
	0	4,669	96.67	46,132	99.34
JOB_H	1	68	1.41	131	0.28
	0	4,762	98.59	46,309	99.72
JOB_A	1	101	2.09	216	0.47
	0	4,729	97.91	46,224	99.53

Source: Author's calculations based on social network survey 2009

With the help of the following descriptive statistics (Table 14 and Table 15), we want to investigate the degree to which individuals who interact in one relation also interact in another one (multiplexity). Table 14 shows that only 5 % of the households are connected. However, half of those are multiplex. Only nine households are connected for all five relation types included in the analysis.

Table 14: Multiplexity at the household level

Dyad connections by number of relation types	Incl. Zero dyads		Excl. Zero dyads	
	Frequency	Per cent	Frequency	Per cent
None	4,567	94.55	-	-
One	123	2.55	123	46.77
Two	80	1.66	80	30.42
Three	37	0.77	37	14.07
Four	14	0.29	14	5.32
All five	9	0.19	9	3.42
Total	4,830	100	263	100

Source: Author's calculations based on social network survey 2009

Table 15 displays the pairwise correlation coefficients between the dependent variables at the household level. All correlations are statistically significant and correlation coefficients range from 0.20 to 0.51. Results underline the reliability of information provided by respondents as shown by the high correlation between hypothetical and actual relation types.

Table 15: Pairwise correlation coefficient of relational variables at the household level

	$SHOCK_{HH}$	$CREDIT_{HH}$	$AGRICULTURE_{HH}$	JOB_H_{HH}	JOB_A_{HH}
$SHOCK_{HH}$	1				
$CREDIT_{HH}$	0.40*	1			
$AGRICULTURE_{HH}$	0.34*	0.39*	1		
JOB_H_{HH}	0.25*	0.20*	0.42*	1	
JOB_A_{HH}	0.36*	0.30*	0.44*	0.51*	1

Notes: $N_{HH,D}$= 4,830. * denote significance at the 5 % level.

Source: Author's calculations based on social network survey 2009

In summary, this descriptive analysis generates four important messages. First, social exclusion in the village exists regardless of the definition of exclusion and the network boundary. Second, network density is low, albeit still comparable to what others found (e.g. Fafchamps & Gubert, 2007a; De Weerdt, 2002). Third, multiplexity is high and fourth, the correlation coefficients between hypothetical and actual relation types suggest that the information collected from the survey is valid.

5.7 Dyadic regression results

In this section, we present the results of the dyadic regression first at the household and thereafter at the individual level. The definition of the variables used (see Appendix 8, Appendix 9) and the descriptive statistics of the independent variables (see Appendix 10, Appendix 11) can be found in the appendix.

5.7.1 Dyadic regression results at the household level

The models formulated to investigate the factors that determine network formation for the five different relation types at the household level are presented in Table 16. We confirm findings from the literature (e.g. Comola, 2008; Fafchamps & Gubert, 2007a; De Weerdt, 2002) that kinship and friendship are significant determinants for network formation of all relation types. Geographic distance (neighbourhood) is significant only for $CREDIT_{HH}$ networks.

Contrary to findings in the many literatures, we find that income is an important determinant for all relation types. The likelihood of a tie increases if both households belong to the lowest income quintile, i.e. the poor help each other. Furthermore, for $SHOCK_{HH}$ networks, the

variable "both in highest 2 income quintiles"[26] is significant and positive. This suggests that for this relation type wealthier households would help each other. In order to investigate the asset hypothesis (see chapter 5.2), we estimated another model specification substituting the income for asset variables.[27] Here, we find that for both JOB networks (hypothetical and actual) asset poor households are more likely to receive help from those with a higher asset endowment. This could mean for example that a household with a car is more likely to help a poor household to find a job in the city.

Literature findings (e.g. Caeyers & Dercon, 2011) suggest that connections to members in official positions (village committee) are useful to obtain public assistance. This is confirmed by our regression results. For $SHOCK_{HH,}$ JOB_H_{HH} and JOB_A_{HH} networks, households with fewer members in the village committee are more likely to get help from those who are better represented in the village committee.

In addition, we find for $AGRICULTURE_{HH}$, JOB_H_{HH} and JOB_A_{HH} networks that the likelihood of a tie is higher, the lower the sums of the two households' mean age suggesting that households with more members in the working age provide each other with information.

Migration is often stated as a strategy to diversify risks, as source of capital for investments or of information about job opportunities (e.g. Massey et al., 1993). For hypothetical JOB_H_{HH} networks, we can confirm the latter since households with fewer migrants cite households with more migrants as hypothetical source of information about job opportunities. However, for actual JOB_A_{HH} networks the variable "difference in the percentage of migrants" is not significant. For $CREDIT_{HH}$ networks, households with more migrants seem to be less likely to lend money to someone else (see Table 16).

For the $SHOCK_{HH}$ networks, most of the social distance variables for occupation (differences in "number of own agriculture", "number of farm labour", "number of non-farm labour" and "number of not working"), are found to be significant. Here, we can observe that households with opposite occupation characteristics interact in the expected direction, i.e. those with less persons in a certain occupation help those with more. This pattern is confirmed for the $AGRICULTURE_{HH}$ networks. The differences in the "number of own agriculture" and the "number of farm labour" are significant. For JOB_H_{HH} networks, the migrant variable has the

[26] We take the highest two income quintiles due to a insufficient number of cases for the $CREDIT_{HH}$ network.
[27] The results of the second model specification will be provided upon request.

expected sign while this is not the case for the variable “difference in number of non-farm labour”. Here, we also see differences between hypothetical and actual JOB networks.

Table 16: Dyadic regression at the household level

	(1) $SHOCK_{HH}$	(2) $CREDIT_{HH}$	(3) $AGRICULTURE_{HH}$	(4) JOB_H_{HH}	(5) JOB_A_{HH}
Kinship	3.127***	2.771***	3.472***	2.825***	2.771***
	(0.393)	(0.470)	(0.574)	(0.707)	(0.478)
Friendship	2.945***	2.401***	3.303***	2.644***	2.667***
	(0.408)	(0.369)	(0.437)	(0.533)	(0.431)
Neighbours	0.172	1.044***	0.510	0.721	0.188
	(0.514)	(0.355)	(0.536)	(0.693)	(0.484)
Same gender of household head	0.043	-0.557	-0.422	-0.381	-0.044
	(0.326)	(0.363)	(0.295)	(0.474)	(0.398)
Both in highest 2 income quintiles (t-1)	1.048**	0.613	0.331	0.270	-0.113
	(0.418)	(0.386)	(0.366)	(0.483)	(0.296)
Both in lowest income quintile (t-1)	1.038***	1.250***	0.694*	1.848***	0.797**
	(0.345)	(0.438)	(0.421)	(0.341)	(0.326)
Difference in:					
Household size	0.086	-0.036	0.094	-0.223	-0.115
	(0.095)	(0.121)	(0.098)	(0.172)	(0.090)
Mean age (years)	-0.010	-0.021	0.013*	0.012	0.009
	(0.011)	(0.015)	(0.008)	(0.011)	(0.008)
Mean education (years)	-0.060	-0.094**	0.036	0.144***	-0.007
	(0.042)	(0.046)	(0.022)	(0.054)	(0.040)
Percentage of migrants	-0.030	0.765***	-0.070	-1.587**	0.207
	(0.556)	(0.234)	(0.284)	(0.701)	(0.319)
Number of own agriculture	-0.382***	0.014	-0.230**	0.035	0.118
	(0.120)	(0.170)	(0.092)	(0.166)	(0.127)
Number of farm labour	-0.029	0.044	-0.233***	0.088	0.343*
	(0.123)	(0.147)	(0.082)	(0.222)	(0.187)
Number of non-farm labour	-0.273*	-0.071	-0.125	0.561***	0.152
	(0.159)	(0.145)	(0.150)	(0.216)	(0.149)
Number not working	-0.410**	-0.220	-0.214	0.181	0.164
	(0.193)	(0.250)	(0.160)	(0.219)	(0.187)
Number of village committee members	-0.863***	0.215	0.231	-0.958*	-0.571**
	(0.187)	(0.354)	(0.252)	(0.512)	(0.266)
In-degree from households $\notin$ N_{HH} for respective relation type k	0.050	-0.036	0.184***	-0.134	0.015
	(0.047)	(0.094)	(0.059)	(0.126)	(0.072)
Out-degree to households $\notin$ N_{HH} for respective relation type k	n/a	-0.138	-0.297***	-0.074	-0.062
		(0.118)	(0.049)	(0.200)	(0.106)
Sum of:					
Household size	0.001	-0.095	-0.094*	-0.065	0.017
	(0.048)	(0.075)	(0.050)	(0.073)	(0.070)
Mean age (years)	0.000	-0.018	-0.040***	-0.045***	-0.027*
	(0.012)	(0.014)	(0.015)	(0.013)	(0.015)
Mean education (years)	0.034	0.011	0.011	-0.036	-0.004
	(0.040)	(0.065)	(0.048)	(0.056)	(0.047)
constant	-6.401***	-3.427*	-1.432	-1.780	-3.245*
	(1.458)	(1.979)	(1.438)	(1.501)	(1.812)
N	4,830	4,830	4,830	4,830	4,830

Notes: Dependent variable=1 if household "1" cites household "2", 0 otherwise. Estimator is logit. Standard errors corrected for dyadic correlation of errors in brackets. ***, ** and * denote significance at the 1 %, 5 % and 10 % level, respectively. n/a: variable dropped since this question was not asked for $SHOCK_{HH}$ networks.

Source: Author's calculations based on social network survey 2009 & household surveys 2008 & 09

5.7.2 Dyadic regression results at the individual level

The dyadic models at the individual level (see Table 17) reveal additional determinants for network formation otherwise not exposed at the household level. Foremost, the effect of the degree of kinship (e.g. parents/children, brother/sister), the intra-household relationships and the intensity of individual communication (e.g. "number of phone calls") can be identified. Most coefficients for the four kinship variables are significant and show the expected signs for all five relation types. In the case of non-significant coefficients, results seem plausible. For example, for $CREDIT_P$ networks the variable "brother/sister" is significant while the variables "husband/wife" and "parents/children" are not. Sharing of financial resources between partners and parents/children is more likely than among brothers/sisters who might have founded new families.

As in the household models, the variable "friendship" is positively significant for all relation types which underline the validity of our models.

Further insights can be gained from variables like "number of phone calls" and "number of visits". These have the expected signs and are significant over all five relation types. Higher frequency of phone communication and personal visits induce a higher likelihood of receiving help. Hence, friendship and kinship are the major determinants for network formation. As shown by the variable "same household" which is not significant for most of the relation types, being part of the same household is unimportant. Only for $SHOCK_P$ networks, it is household members who would help each other.

For geographic distance variables, we find interesting results, too. Borrowing is more likely among migrants than among villagers which suggests that villagers either are less in need for credit or may have better access to other formal and informal credit sources. For $AGRICULTURE_P$ networks, the coefficient is significant and has the expected sign. If both are migrants, help in agriculture is largely irrelevant. Similarly, for JOB_H_P networks the coefficient for the variable "both villagers" is negative as expected. Consistent with the results of the household model, geographic distance is not a determinant for helping in case of a shock.

This is also true for help received from government officials which is significant for all relation types except for $CREDIT_P$ networks at the individual level. For $AGRICULTURE_P$ networks, the variable "b government official" is significant. However it is not significant in the household model indicating that relationships with government officials responsible for agricultural projects are effective.

Gender is significant for four out of the five relation types. It seems plausible, that help is more likely if persons are of the same gender; another insight that we can gain from the model at the individual level.

Additional information is also obtained from the variables difference in "in- and out-degrees from/to individuals outside the network boundary". While at the household level, ties with households outside the village matter only for $AGRICULTURE_{HH}$ networks, at the individual level coefficients are significant and show the expected signs for all relevant relation types. It is plausible that for $AGRICULTURE_{P}$ and JOB_H_{P} networks, an individual is more likely to receive help from another person who is providing more help to individuals outside the network boundary (village) than the receiver does. Hence, in the social environment of a village, there are persons who are central in providing information and other assistance. In villages in Thailand this role is mostly held by the village headman.

Table 17: Dyadic regression at the individual level

	(1) $SHOCK_P$	(2) $CREDIT_P$	(3) $AGRICULTURE_P$	(4) JOB_H_P	(5) JOB_A_P
Husband/wife	0.677	-0.723	2.045***	1.643**	2.358***
	(0.850)	(0.810)	(0.695)	(0.703)	(0.697)
Brother/sister	2.138***	1.844***	2.671***	2.837***	1.661**
	(0.749)	(0.634)	(0.809)	(0.815)	(0.702)
Parent/child	3.118***	0.658	3.820***	3.231***	2.843***
	(0.695)	(0.803)	(0.637)	(0.647)	(0.708)
Grandparent/-child	1.878**	n/a[1]	2.507***	n/a[1]	2.758***
	(0.908)		(0.945)		(0.941)
Friendship	2.921***	1.454***	2.643***	2.475***	2.346***
	(0.694)	(0.533)	(0.600)	(0.766)	(0.657)
Same household	1.745***	-0.089	-0.447	-0.099	0.474
	(0.589)	(0.657)	(0.486)	(0.543)	(0.488)
Number of phone calls	0.004**	0.007***	0.007***	0.007***	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Number of visits	0.003***	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Same gender	0.409**	0.390*	0.493***	0.153	0.719***
	(0.160)	(0.199)	(0.137)	(0.271)	(0.206)
Both villagers	-0.439	0.239	-0.419	-0.814*	-0.449
	(0.402)	(0.380)	(0.311)	(0.455)	(0.340)
Both migrants	-0.350	1.376**	-0.977**	0.017	0.175
	(0.762)	(0.588)	(0.477)	(0.321)	(0.320)
Both own agriculture	0.304	0.600*	1.072***	0.841*	0.677*
	(0.285)	(0.349)	(0.302)	(0.471)	(0.385)
Both farm labour	-0.539	-1.237	0.274	0.298	1.813***
	(0.798)	(1.007)	(0.460)	(0.654)	(0.428)
Both non-farm labour	0.274	-0.542	0.245	0.141	0.437
	(0.698)	(0.710)	(0.536)	(0.527)	(0.392)
Individual "b" is government official	1.445***	-0.506	1.829*	1.653***	1.865***
	(0.386)	(0.452)	(1.074)	(0.617)	(0.363)
Difference in:					
Age (years)	-0.010	-0.018**	-0.015***	-0.015**	-0.013***
	(0.008)	(0.008)	(0.005)	(0.007)	(0.005)
Education (years)	-0.006	-0.069**	0.005	0.011	-0.005
	(0.030)	(0.027)	(0.018)	(0.020)	(0.019)
In-degree from individuals $\notin$ N_{HH} for respective relation type k	-0.263***	-0.247**	0.074	-0.611***	-0.045
	(0.074)	(0.117)	(0.073)	(0.168)	(0.152)
Out-degree to individuals $\notin$ N_{HH} for respective relation type k	n/a[2]	0.078	-0.200**	-0.408**	0.125
		(0.144)	(0.082)	(0.191)	(0.105)
Sum of:					
Age (years)	0.008	-0.008	-0.004	-0.024**	-0.027***
	(0.006)	(0.009)	(0.009)	(0.010)	(0.009)
Education (years)	-0.006	-0.075**	-0.017	-0.068**	-0.065**
	(0.025)	(0.031)	(0.029)	(0.034)	(0.031)
constant	-7.733***	-6.398***	-6.428***	-5.042***	-4.672***
	(0.793)	(1.073)	(1.066)	(1.082)	(1.012)
N	46,440	46,440	46,440	46,440	46,440

Notes: Dependent variable=1 if individual "a" cites individual "b", 0 otherwise. Estimator is logit. Standard errors corrected for dyadic correlation of errors in brackets. ***, ** and * denote significance at the 1 %, 5 % and 10 % level, respectively. n/a[1]: variable dropped since no grandparent/-child dyad existent for $CREDIT_P$ and JOB_H_P networks. n/a[2]: variable dropped since this question was not asked for $SHOCK_P$ networks.

Source: Author's calculations based on social network survey 2009 & household surveys 2009

5.8 Summary and conclusions

This paper aimed to contribute to a better understanding of support and insurance networks in rural villages in Thailand. We had three specific objectives, first to determine the degree of inclusiveness of existing safety nets in a typical village and hence the share of households excluded from social protection. To investigate this question, we selected five relation types, i.e. two risk-sharing, one agricultural and two employment networks. Here, we find that social exclusion exists but seems unrelated to ex-post income poverty. However, households may be vulnerable to poverty as, depending on the relation type, up to 30 % of the households in the village are excluded. This has important policy implications during crisis situations, for example when a migrant loses her job and turns to her natal household for help.

Second, we wanted to identify the pattern of multiplexity. Most households connected with one tie rely at the same household for different relation types. Thus, multiplexity can be considered as high. This could be an indication of a rather traditional social structure, i.e. low diversity in network partners and households are not yet making much use of comparative advantages. Hence, the transformation towards a more open type of society is still in the infant phase. The result is further aggravated when we look at the network density. We find that the network density for the five analysed relation types is low. Only about 5 % of all possible dyad combinations at the household level have a tie. Thus, people in our study village have little interaction among each other, which may put them at risk in shock situations.

Third, we examined the determinants for network formation of the five relation types by accounting for intra-village ties and those across the geographical village boundary to account for multi-location households comprising migrants and villagers. We formulated dyadic regression models at the household and at the individual level. The findings confirm our hypothesis that kinship and friendship are the major determinants of network formation. In this regard, our result is in line with previous findings (e.g. De Weerdt, 2002). However, from our dyadic regression at the individual level, we find that the degree of kinship (e.g. husband/wife, parent/child) matters. In addition, results at the individual level show that being part of the same household matters only for $SHOCK_P$ networks and not for the other relation types. This result indicates that traditional kinship relations are gradually breaking up. This needs to be considered in the design of social protection policies for rural areas of emerging market economies.

Regarding our second hypothesis, we confirm that for $CREDIT_{HH}$ networks that geographic proximity increases the likelihood of a tie while for the other relation types no significant results were found at the household level. At the individual level, our results imply important policy implications. The result of the $CREDIT_{P}$ network, i.e. the likelihood of a tie increases if both individuals are migrants, suggests that migrants are exposed to a lower level of social protection than villagers.

Finally, based on our results we must reject the hypothesis that differences in assets are important for tie formation while income is not. Using income quintiles as determinants, significant results are found. In contrast to the literature (e.g. Fafchamps & Gubert, 2007a), we find that differences in assets only matter for one out of five relation types included in the analysis. Since the poor rather rely on the poor, our results support the popular phrase: “birds of a feather flock together” (McPherson et al., 2001, p. 417). This has implications for the poverty reduction and social protection programmes which rely on the existing village hierarchy.

Further research is needed to investigate which factors cause social exclusion. In addition, the impact of social exclusion for different relation types and the role of multiplexity for vulnerability to poverty should be determined.

6 PROGRAMME TARGETING AND HOUSEHOLD DEFINITION

Paper to be submitted to Journal of Development Effectiveness.

6.1 Introduction

In emerging market economies, the large inequalities in wealth between urban and rural areas require government intervention programmes for rural development, poverty reduction and social protection. The effectiveness of such interventions is often impaired because of the difficulties with programme targeting. In villages in emerging market economies the composition of rural households is highly variable, which is mainly a result of temporary rural-urban migration. However, proper identification of the target group is necessary for efficient resource allocation (e.g. Coady, Grosh, & Hoddinott, 2004; Lavellee, Olivier, Pasquier-Doumer, & Robilliard, 2010; Weiss, 2006). One cause of identification errors is the classification of households into poor and non-poor based on household income (Bigman & Fofack, 2000). Similar problems exist if non-income indicators such as ownership of assets, education or gender are used (e.g. Bigman & Fofack, 2000; Coady et al., 2004; Glewwe, 1990, 1992). There are at least two reasons for identification errors, i.e. non-target households benefit from a programme (inclusion error) or the programme fails to reach the target population (exclusion error) (Bigman & Fofack, 2000; Cornia & Stewart, 1993; Weiss, 2006). First, poor civil registration records are often unreliable and outdated census data (especially for income) in developing countries introduce uncertainty in the planning of programmes. Second, the choice of the household definition will ultimately determine which household is above or below the poverty line. As shown by the study of Beaman and Dillon (2012), the household definition influences the household composition and hereby per capita income or consumption which defines a household to be below or above the poverty line. As pointed out by Schiff (2008), the household definition is especially crucial if target populations are unstable due to rural-urban migration.

In this paper, we investigate the effect of the household definition on the targeting and the effectiveness of rural development, poverty reduction and social protection programmes using the case of a village as programme intervention area. From this village, we have detailed socio-economic panel data of every household collected in 2008 and 2009. In addition, we

conducted interviews with all individual household members above 14 years in 2009 including those who live and work as migrants mostly in the Greater Bangkok area. Hence, we will be able to investigate the effects of different types of intervention programs on the village and its households under different household definitions. We use four household definitions commonly applied in development studies and show how these affect inclusion and exclusion errors. We choose three programmes which are currently popular for rural development in Thailand, namely: (1) rural development programmes, (2) programmes aiming to reduce poverty and (3) social protection programmes, in our case aimed at the elderly in the village.

Our objective is to assess the implications of the four household definitions on the identification error when determining the target population of programme interventions under the conditions of highly mobile village populations related to rural-urban migration which is typical for emerging market economies.

We proceed with our analysis in three steps. First, we review the concept of the household as used in development studies and we describe the differences among household definitions commonly applied in development programmes. Second, we outline the methodology and data which we use to test our hypothesis. Thereafter, we provide some descriptive results and show the effect of the choice of household definition on targeting and cost effectiveness of programme implementation. The last section concludes.

6.2 Household definitions

While in the past rural households in poor countries were a rather static and unitary organisation (e.g. Ellis, 1993), in recent years the livelihoods of even poor people in rural areas of developing countries have changed drastically. In general the rural people become more mobile and much less localised as in the past. Especially younger household members often seek off-farm employment outside their natal villages (Rigg, 2006). They may leave and return to their natal household sometimes more than once during the year (Gödecke & Waibel, 2011), which is due to often uncertain and poor quality employment in urban areas (Amare et al., 2012). Mobility of the rural population poses a challenge for development programmes that aim to improve the well-being of rural households because parameters of per capita well-being, which often are the basis for programme eligibility, are difficult to determine.

In the scientific literature, in development practice, in statistical surveys and censuses, numerous household definitions can be found, which are mostly derived from the purpose of the data collection (e.g. Grosh & Glewwe, 1995, 1998, 2000; Grosh & Munoz, 1996; Johnson, Round, & McKay, 1990; UNECE et al., 2007). Generally household definitions differ by the criteria used. They determine which persons are included and who would be considered to be outside the household. Consequently, the broader the definition the more difficult it is to compute the living standard of households (Deaton, 1997). Programmes such as the World Bank's Living Standards Measurement Study (LSMS) (e.g. Grosh & Glewwe, 1995, 1998, 2000; Grosh & Munoz, 1996) or the United Nations Household Survey Capability Programme (e.g. Johnson et al., 1990; DESA, 2004; UNECE et al., 2007; NHSCP, 1989) aim to assist developing countries to standardise their data collection activities. However, surveys are often adjusted to country specific circumstances and are influenced by local data collection traditions, policies or other social and economic issues (e.g. Grosh & Glewwe, 1995, 1998, 2000; Grosh & Munoz, 1996; UNECE et al., 2007).

As pointed out by several authors (e.g. Casley & Lury, 1987; Deaton, 1997; Rigg et al., 2012; Russell, 1993), in developing countries complex structures of living arrangements exist due to, for example, polygamy, patchwork families and household dynamics and mobility of household members. To accommodate the manifold features of households, multiple criteria are required which make it difficult to define households. While it is impossible to discuss the wide range of criteria used, perhaps the most common ones (e.g. Johnson et al., 1990; DESA, 2004; UNECE et al., 2007; NHSCP, 1989) are shown in Table 18: (i) living together in a common dwelling, (ii) eating together, (iii) belonging to the same family or kinship, (iv) a pooled budget and most importantly (v) the number of days an individual stays in the household during a defined reference period, i.e. a year.

Table 18: Overview of different household (HH) definitions

Criteria/definition	A	B	C	D
a) Common dwelling	yes	yes	yes	yes
b) Shared meals	yes	yes	yes	yes
c) Kinship relation necessary	no	no	no	no
d) Shared budget	yes	yes	yes	yes
e) Minimum days in the HH/year[a]	0	90	180	270

Notes: [a] There are some exceptions for certain household members (e.g. household head, new-borns or students).

Source: Author's illustration based on Grosh and Glewwe (1995, 1998, 2000); Grosh and Munoz (1996); Hardeweg et al. (2012); NSO (2004); UNECE et al. (2007)

Definition A includes *all* persons whom the household head considers to be members (see Table 18). This definition best accounts for temporary and seasonal migration, where household members leave the household and return once or more times during the year (Hardeweg et al., 2012). This pattern is common in Thailand and other Asian developing countries where rural households form sub-households in urban areas (e.g. Curry & Koczberski, 1998; Mills, 1997). Sub-households are not independent units since migration is part of the livelihood strategy of rural households in order to increase their well-being and to diversify risk (e.g. Rosenzweig & Stark, 1989; Stark & Levhari, 1982; Taylor & Fletcher, 2007).

Definition B is used in "prototypical" LSMS surveys as for example in Ghana (Grosh & Glewwe, 1995, 1998, 2000; Grosh & Munoz, 1996). In principle, all persons are included who stayed with the household at least three months during the survey year. However, infants younger than the specified three months period and, regardless of their duration of presence in the household, the household heads are included.

In definition C, all persons who are present at least six out of 12 months and infants who are younger than six month are included.

In definition D, a person is considered a household member if she normally lives with the household but may be temporarily away for less than three months. If she is away for more than three months, she is still considered as household member without other permanent residence. In addition, students who go abroad for less than six months for education or training are still considered household members. Furthermore, any boarders or lodgers who live with the household temporarily for more than three months are also included. This

definition is generally used in the Thailand Household Socio-Economic Survey (e.g. NSO, 2004) and thus is the basis for policy interventions of the Thai government.

It is obvious that the definition of a household has implications for its characteristics and thus affects the parameters commonly used to determine their inclusion in intervention programmes in several ways. For example, including or excluding a person affects household size and therefore per capita consumption, income and wealth. It also affects total household income as the inclusion and exclusion of a person defines which payments are to be considered as intra-household transfers and which ones are remittances. Generally, information on remittances is less reliable. Furthermore, the household definition also affects the gender and dependency ratios as well as the occupational orientation of the household, i.e. agriculture versus non-agriculture. In consequence, the choice of the household definition determines the eligibility of villages, households or persons to be included or excluded from external intervention programmes. Depending on the aim and the nature of the intervention programme, e.g. reduction of poverty, inequality or supporting specific persons like children, women or the elderly, the household definition will tend to increase the exclusion or the inclusion error.

For example a wider household definition will tend to lead to higher per capita income and consequently lower headcount and poverty gap ratio. Another effect of the household definition is the amount of resources needed to achieve the programme target. Hence, the cost effectiveness of an intervention programme is influenced by the degree to which the chosen household definition is compatible with the objectives of the programme.

6.3 Methodology and Data

Our analyses are based on a census of a village, in the province Phetchaboon, some 350 km north of Bangkok. The village is located in a mountainous terrain in a heavily deforested area with generally poor natural production conditions. Temporary migration is very frequent in the village due to the relative nearness to the Bangkok job market. All village households were interviewed in two waves. Wave 1 was conducted during May/June 2008 and wave 2 exactly one year later. The verified number of households and persons during the first household

survey were 73 households (N_{HH}) with a total population of 303 persons (N_P).[28] In the panel survey in 2009, the number of households was reduced to 70 households and 292 persons due to death and household relocation.

The questionnaire which was used for the household interviews included modules on income generating activities, consumption, education, health, household dynamics, risks and shocks, borrowing and lending, public transfers, insurance, assets, housing, information of the household's institutional linkages and social network information. The questionnaire was designed in such a way that it allowed the use of alternative household definitions. The widest definition which was adopted includes all persons who were considered to be members by the household head regardless of their duration of absence or their family and kinship. In addition, the household questionnaire included questions about the criteria (see Table 18) commonly used to define the household so that the household definitions discussed in the previous chapter could be applied ex-post. In the second wave, in 2009, in addition to the household heads, we interviewed all 216 individual household members above 14 years separately, emphasising on employment and network information.

We use the village as a potential target for programme intervention for rural development; poverty reduction and social protection (see Table 19). Rural development programmes aim to improve existing infrastructure in the village, including feeder roads, school and health facilities. For this programme, we defined three possible inclusion criteria: the village is eligible if: a) the village headcount (HCR) is above 0.3[29], b) the poverty gap ratio (PGR) is 0.15[30] and c) the Gini coefficient (GC) is above 0.5[31]. The second programme is a poverty reduction programme using cash transfers to eligible households as payment vehicle. The inclusion criteria are: a) the household per capita income is below the poverty line and b) the household belongs to the lowest net income quintile. The third programme, i.e. a social protection programme, aims to support the elderly in the village. There are two programme variants. Type a) is based on the 500 THB per month Universal Pension Scheme[32] and type b) on the

[28] The number of households deviated from the official village list from 2007 which indicated 107 households with 397 persons; however only 73 households actually existed.
[29] The benchmark of 0.3 to differentiate between poor and non-poor villages in Thailand was proposed by Jitsuchon and Richter (2007).
[30] The poverty gap benchmark of 0.15 was chosen because it equals the poverty gap ratio of all of Thailand in 2007 (NESDB, 2007).
[31] The chosen Gini coefficient benchmark of 0.5 equals the Gini coefficient of all of Thailand in 2007 (NESDB, 2008).
[32] After the failure of the previous old-age allowance system, the 500 Thai Baht Universal Pension Scheme was offically introduced in April 2009 (Sakunphanit & Suwanrada, 2011). In the current scheme, "all elderly (60 years of age and older) who are not in the elderly public

former Thai old-age allowance system[33] (Sakunphanit & Suwanrada, 2011). For type a) an individual is eligible to receive a transfer payment of 500 THB per month if 60 years of age or older. For type b) an elder person is eligible to receive 200 THB per month if she is 60 years of age or older and belongs to a household below the poverty line.

As benchmark in our analyses we use three different poverty lines (PL), namely: i) the provincial poverty line (PPL) of 2007 equal to 1,267 THB per capita and month, ii) the national poverty line (TPL) of 2007 equal to 1,443 THB per capita and month (NESDB, 2007) and iii) a relative poverty line (RPL) with 50 % of the median income of the village. The latter is thus equal to 1,220.5, 894.7, 792.1 and 894.7 THB for definitions A, B, C and D respectively.

Table 19: Targeting programmes

Programme type		Description	Target population	Inclusion criteria
1	**Rural development**	Improvement of infrastructure	Village	a) Village with HCR > 0.3 b) Village with PL > 0.15 c) Village with a GC > 0.5
2	**Poverty reduction**	Transfer payment to the poor	HH	a) HH < PL b) HH in lowest net income quintile
3	**Social protection**	Support for the elderly	Individual	a) Individual ≥ 60 years b) Individual ≥ 60 years & HH < PL

Source: Author's own illustration

To assess the implications of the four household definitions presented in Table 18 on potential targeting programmes, firstly for each village household it was decided which individuals are counted as household members for each definition using the household criteria presented in Table 18. The calculations of the household characteristics and indicators needed in the following analyses are based on the respective household members who might differ among the four definitions.

6.4 Descriptive Results

This chapter shows the results of comparing household size, household characteristics and household income between the four household definitions. In Table 20, mean, standard deviation, and range of the size of households are presented. As expected, household size

facilities (i.e., recipients of a government pension, government-employed persons) are eligible for the Scheme" (Sakunphanit & Suwanrada, 2011, p. 409).

[33] The Thai old-age allowance system was established in 1993 (and reformed in 2005) under the aegis of the Department of Public Welfare. This system was based on means-testing and "povided financial assistance to the underprivileged elderly, defined as a person at least 60 years of age with inadequate income to meet expenses, lacking a suporter, or who is abandoned or unable to work. The allowance per person per month was 200 [Thai] Baht" (Sakunphanit & Suwanrada, 2011, p. 407). In 2006, allowance increased to 500 Thai Baht per person per month.

changes dramatically with the choice of the definition. This is confirmed by the results of the Wilcoxon matched-pairs signed-rank sum tests as we can reject the null hypotheses that the distributions are the same for all six combinations of the applied household definitions. Also the Friedman Test substantiates these findings since we can also reject the null hypothesis at the 0.01 significance level and thus conclude that the mean rankings of the household size for the definitions are significantly different from each other (Table 21). The average number of household members is highest for the most liberal definition (A) and lowest for the "Thailand definition" (D). The differences become even more obvious if we take the range. For A it is from 1 to 11 while for C and D the maximum is 7 and the minimum is zero. Hence, in the two latter definitions some 10 % of the households in the village would no longer be included. If however programmes are implemented that adopt definition A, which takes into account the sub-household and migration, all village households would be considered. Another implication of the more restrictive definition is that in surveys where interviews are carried out in a very short period, households with absentee members would perhaps be excluded and hence no information will exist. In fact, in this study for most of the households excluded under definitions C and D a second visit was necessary to conduct the interviews.

Table 20: Household size by household definition

Definition	A	B	C	D
Mean	4.15	2.97	2.74	2.53
Std. dev.	1.99	1.55	1.66	1.59
Min	1	1	0	0
Max	11	7	7	7
$\mathbf{N_{HH}}$	73	73	66[a]	65[a]

Notes: [a] Reduced N_{HH} due to households with zero household members.

Source: Author's calculations based on household survey 2008

Table 21: Wilcoxon matched-pairs signed-rank sum and Friedman Test on household size

Wilconxon matched-pairs signed-rank Sum	Definition A		Definition B		Definition C	
	z-value	Pr(|Z|>|z|)	z-value	Pr(|Z|>|z|)	z-value	Pr(|Z|>|z|)
Definition B	5.98	0.0000				
Definition C	6.19	0.0000	-3.87	0.0001		
Definition D	6.64	0.0000	-5.08	0.0000	3.46	0.0005
Friedman	50.273					
Kendall coefficient of concordance	0.230					
p-value	0.0000					

Notes: N_{HH}=73.

Source: Author's calculations based on household survey 2008

In Table 22, the village population, dependency ratio and occupational orientation of household members are shown for the four household definitions. Again there is marked difference in the target population. For definition A the village population is higher by some 60 % as compared to D. Hence, in relative terms more individuals would be excluded than households (see Table 20). On the other hand, results are quite stable for the elderly population, i.e. persons above 60 year of age. However, the dependency ratio differs because there is more variation among the number of individuals in the labour force who are between 15 and 64 years. The household definition also greatly influences the structure of occupations by household members. The biggest difference can be observed in non-farm labour which is over six times higher in A as compared to D. This difference clearly illustrates the effect of migration. Consequently, the Thai government household definition is biased towards village people, which also means that many of the economically active population would be excluded from programmes. Implicitly the official Thai household definition is still geared towards the traditional village conditions with farming as the main occupation. In reality however, programmes may be confronted not only with farmers and farm labourers but with elderly, unemployed, school children and minors.

Table 22: Characteristics of household members by household definition

Number of individuals/definition	A	B	C	D
Above 60 years	30	30	29	27
Dependency ratio	0.37	0.51	0.55	0.57
Occupation:				
Own agriculture	66	66	65	60
Self-employment	17	14	11	10
Farm labourer	33	27	22	22
Non-farm employees	83	23	18	12
Elderly and unemployed	37	32	31	31
Students, children & others	67	55	53	50
$\mathbf{N_P}$	303	217	200	185

Source: Author's calculations based on household survey 2008

As expected the household definition has an effect on per capita income as shown in Table 23. However, differences in in mean income are small while the effect is larger in the median income. This is also reflected in the statistical tests: The Friedman test shows that the mean rankings for the per capita net income per month (Table 24) are not significantly different from each other. The Wilcoxon matched-pairs signed-rank sum tests however show for all six combinations of the applied household definitions that the income distributions are significantly different from each other.

Table 23: Comparison of per capita net income per month by household definition

Net income per capita per month in THB/definition	A	B	C	D
Mean	4,344	4,132	4,083	4,236
Std. dev.	8,258	8,519	8,859	8,928
Median	2,441	1,863	1,597	1,789
$\mathbf{N_{HH}}$	71[a]	72[a]	66[b]	65[b]

Notes: [a] Reduced N_{HH} due to missing values in the household aggregate. [b] Reduced N_{HH} due to households with zero household members.

Source: Author's calculations based on household survey 2008

Table 24: Wilcoxon matched-pairs signed-rank sum and Friedman Test on per capita net income per month

Wilconxon matched-pairs signed-rank Sum	Definition A		Definition B		Definition C	
	z-value	Pr(|Z|>|z|)	z-value	Pr(|Z|>|z|)	z-value	Pr(|Z|>|z|)
Definition B	3.291[c]	0.0010				
Definition C	2.590[c]	0.0096	-1.876[b]	0.0606		
Definition D	1.717[c]	0.0860	-2.692[b]	0.0071	-2.148	0.0317[a]
Friedman	0.7538					
Kendall coefficient of concordance	0.0116					
p-value	0.3853					

Notes: [a] N_{HH}=65. The statistics are only for those households that have at least one household member for all household definitions. Reduced N_{HH} due to missing values in the household aggregate: [b] N_{HH}=64, [c] N_{HH}=63.

Source: Author's calculations based on household survey 2008

6.5 Effect on targeting programmes

In this chapter, we show the results of introducing development interventions in the village including: (1) rural development programmes, (2) poverty reduction programmes and (3) social protection programmes (see Table 19). We will investigate the effect of applying the four household definitions on the three types of programmes separately. First, we assess the effect on the target population using the same inclusion criteria and second, we investigate the effects on public spending.

6.5.1 Rural development programmes

Rural development programmes mostly apply geographic targeting and therefore need criteria to identify the target location (e.g. Bigman & Fofack, 2000). We defined three criteria for the village to be included: a) the headcount (HCR) is above 0.3, b) the poverty gap ratio (PGR) is 0.15 and c) the Gini coefficient (GC) is above 0.5 (see Table 19). We first used the provincial poverty line (PPL) to calculate the HCR and PGR and repeat the calculation for the national Thai poverty line (TPL) and the relative poverty line (RPL).

In Table 25, the HCR and the PGR is shown for all four household definitions. Hence, using the PPL the village would be eligible for all household definitions except for A. For a normal Thai government poverty reduction programme, the village would be included. However as results under definition A show, poverty might be much lower as suggested by D which places the HCR at 42 %. Therefore, ignoring the true socio-economic structure of the village might cause an inclusion error as ignoring migration and the multi-location nature of village households will overestimate poverty. Results are the same if the national poverty line (TPL) is applied

although the village just narrowly escaped inclusion for definition A. However, if the relative poverty line (RPL) is used, the village will be excluded for all four household definitions. Here, the HCR almost converge among the four definitions because the difference of the net income estimates between the definitions (see Table 23) is accounted for by the application of a relative poverty line which considers the respective income distribution induced by the choice of the household definition.

If the village PGR is used as inclusion criterion (> 0.15), for PPL and TPL definition A excludes while all three other definitions render the village eligible. However, if the RPL is used as criterion the village is excluded for all four definitions.

Table 25: Headcount and poverty gap ratio by household definition

Poverty indicator/definition	Benchmark	A	B	C	D
HCR	PPL	0.27	0.38	0.41	0.42
	TPL	0.31	0.42	0.45	0.43
	RPL	0.25	0.22	0.22	0.25
PGR	PPL	0.11	0.16	0.17	0.17
	TPL	0.13	0.19	0.20	0.20
	RPL	0.10	0.09	0.07	0.10
$\mathbf{N_{HH}}$		71[a]	72[a]	66[b]	65[b]

Notes: [a] Reduced N_{HH} due to missing values in the household aggregate. [b] Reduced N_{HH} due to households with zero household members.

Source: Author's calculations based on household survey 2008

Figure 7 depicts the Foster-Greer-Thorbecke (FGT) curves with α=0 (J. Foster et al., 1984; Haughton & Khandker, 2009), i.e. the distribution curves of the HCR for the four household definitions subject to variations of the poverty line. Results show that the HCR for the four definitions differ markedly for a wide range of poverty lines but tend to converge for very low (< 600 THB per capita and month) and very high (> 4800 THB per capita and month) values. Note also that definition A is dominated by the three other definitions for most of the range indicating the effect of migration which tends to lower rural poverty estimates.

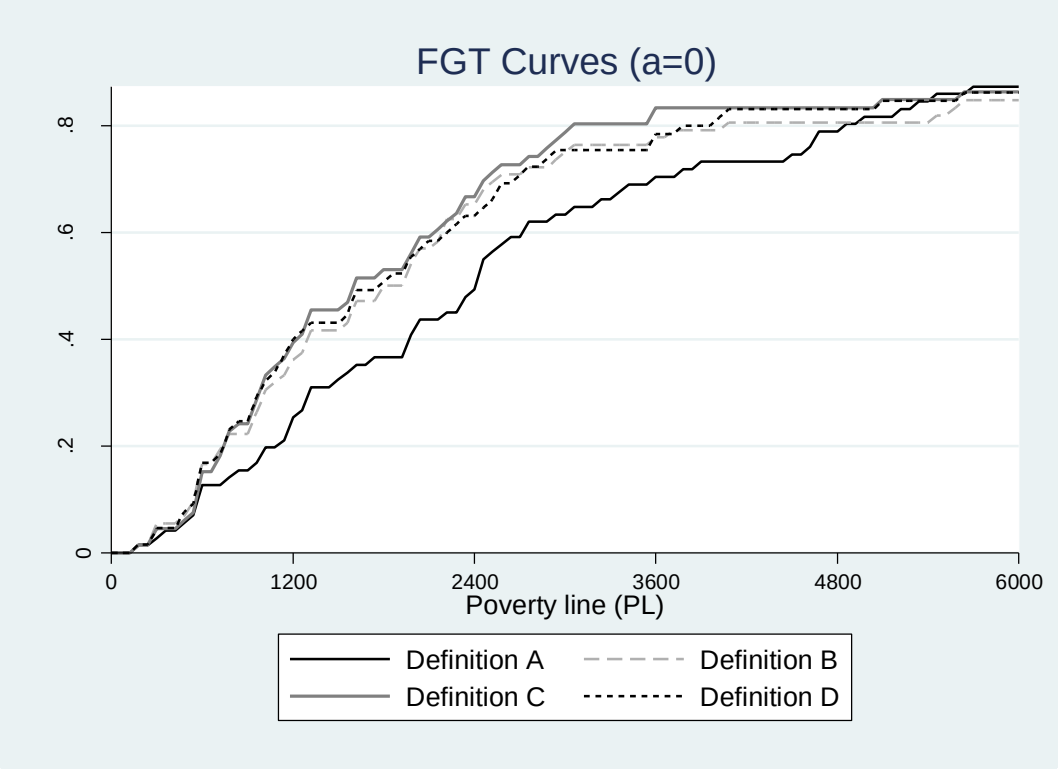

Figure 7: FGT Curves (α = 0) based on monthly per capita net income by definition

Source: Author's calculations based on household survey 2008

Inequality is a major problem in Thailand, which is especially shown in a huge rural-urban divide. Inequality is a source of political conflict which sparked severe tensions during the 2010 "red shirt crisis". Hence, the Thai government is implementing programmes that aim to reduce inequality of household incomes, which is commonly measured by the Gini coefficient (GC). Thus, we used the GC as another inclusion criterion for rural development programmes. The village is eligible for support if the GC is above 0.5 and thus above Thailand's GC in 2007 (NESDB, 2008). Inequality in the village is very high as shown by the GC ranging from 0.55 to 0.67 for definitions from A to D. Village Lorenz curves are shown in Figure 8. Inequality is highest according to the household definition applied in Thailand (definition D) and definition C and lowest for definition A. Again the reference household definition (A) would tend to overestimate the severity of the inequality situation although given the threshold of 0.5 the village would be eligible in all household definitions.

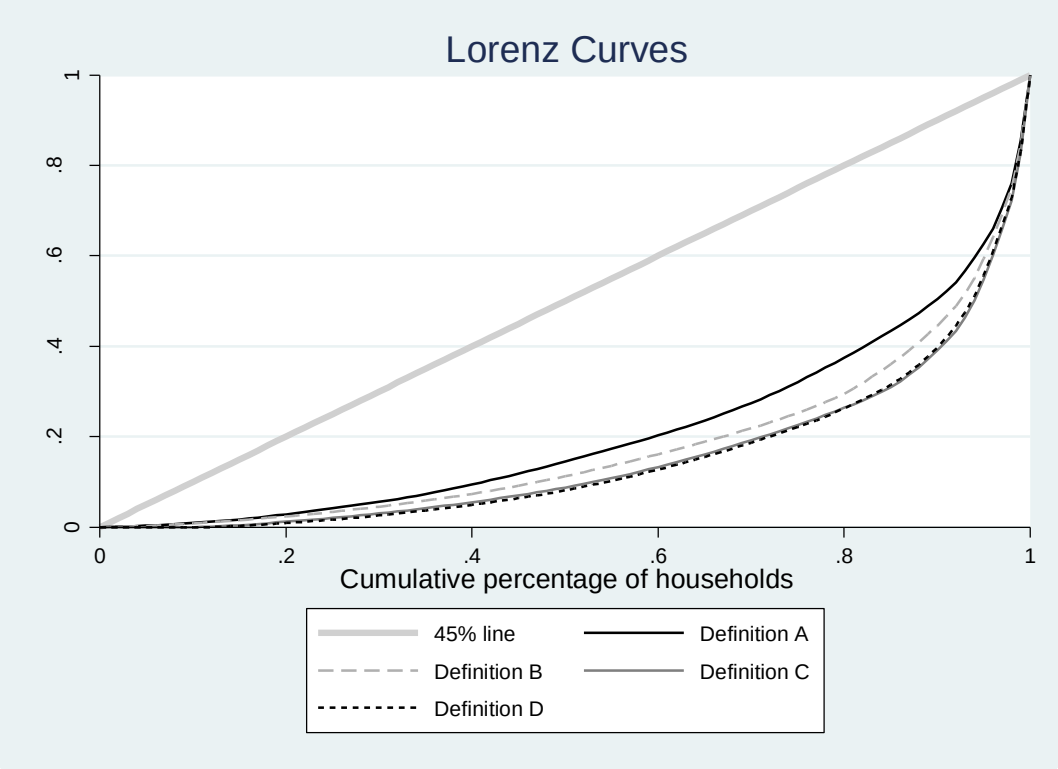

Figure 8: Distribution of per capita net income by definition

Source: Author's calculations based on household survey 2008

In summary, the results underline our assumption that the chosen household definition impact poverty estimates and therefore the target population of rural development programmes. Using HCR and PGR as inclusion criteria, shows that results are sensitive to the poverty benchmark. Results clearly reveal that the official household definition will overestimate both poverty and inequality and thus may result in inclusion errors because a village may become legible simply because the migration effect is ignored.

6.5.2 Effect on poverty reduction programmes

Despite an impressive reduction in HCR in Thailand over the past decades, poverty remains a problem of especially households in the north and northeast of Thailand (Jitsuchon & Richter, 2007; NESDB, 2007). Thus, the Thai government implements poverty reduction programmes to improve the well-being of disadvantaged households. To test the implications of the household definitions two inclusion criteria were selected: a) the households' per capita income is below the poverty line and b) the household belongs to the lowest net income quintile (see Table 19). The application of the first inclusion criterion again

demands for a benchmark, the poverty line, while the latter inclusion criterion b) is independent of this benchmark since it is defined relative to the rest of the village population.

Table 26 shows the implications of the four household definitions on the poverty reduction programme a) that aims to tackle poverty of households below the poverty line. First, the number of eligible households in the village is shown. Second, the mean monthly per household transfer and the total monthly transfer needed to move all households out of poverty will be calculated.

Using the absolute poverty line PPL (TPL), 19 (22) households would be eligible to receive transfer payments if the multi-location household definition A is used. If policy makers base their assessment how many households in the village are in need to lift them out of poverty on one of the other three more restrictive definitions, up to 27 (30) households would be included. The application of the relative poverty line RPL reveals different results. First, the number of households below the poverty line is lowest using RPL for all household definitions. Second, in contrast to the results using the absolute poverty lines, definition A reveals the highest number of poor. Thus, also in this analysis, the results are not only sensitive to the chosen household definition but also to the poverty line.

Table 26: Households below poverty line and financial programme implications (in THB)

Poverty indicator or transfer payment/definition	Benchmark	A	B	C	D
Number of HH < PL	PPL	19	27	27	27
	TPL	22	30	30	28
	RPL	18	16	15	16
Mean of gap to PL in THB	PPL	-512	-540	-511	-516
	TPL	-614	-659	-633	-672
	RPL	-491	-381	-247	-348
Total monthly transfer payment in THB	PPL	9,722	14,565	13,308	13,940
	TPL	13,515	19,766	19,004	18,815
	RPL	8,841	6,095	3,705	5575
N_{HH}		71[a]	72[a]	66[b]	65[b]

Notes: [a] Reduced N_{HH} due to missing values in the household aggregate. [b] Reduced N_{HH} due to households with zero household members.

Source: Author's calculations based on household survey 2008

Table 26 also shows the mean gap of the poor to the poverty line which ranges between 250 THB and 675 THB depending on the poverty line and household definition. This amount would equal the mean monthly transfer payment which the government would need to transfer to

the poor in order to lift their net income to the amount of the poverty line. The total transfer payments are presented in the rows below.

To assess the cost effectiveness of the potential poverty reduction programme, the total amount saved or additionally spend for definition A, B and C has to be compared to the total amount spend according to definition D which is currently used by the Thai government. Since the PPL is the one commonly used, we base the following calculations on this poverty benchmark.

To lift all poor households of the village at a net income level equal to the PPL, the Thai government would need to spend in total 13,940 THB per month. The application of the multi-location definition A would save 4,218 THB to achieve the same. Only the application of definition B, would lead to an additional amount of 625 THB compared to the amount spend if the Thai definition D is used.

In Table 27, we further explore the implications of the household definition on the poverty reduction in the village. We compare the characteristics of: (1) households who are eligible under all household definitions, (2) those not eligible under A but not for the other definitions and (3) households excluded under all definitions. Table 27 shows that 18 households would always be eligible for the poverty reduction programme [group (1)] and 34 would always be excluded [group (3)] irrespective of the chosen household definition. 13 households however switch depending on the household definition between inclusion and exclusion keeping the inclusion criterion and the poverty line constant. 8 of these households [group (2)] would be excluded from the poverty reduction programme if the definition A is applied but included under the other three definitions. Household characteristics of group (2) which proxy the human capital (e.g. years of schooling, dependency ratio) and physical capital (e.g. cropland) relevant to generate (future) income are similar to the characteristics of the group of households which is never poor [group (3)]. Households in group (2) have therefore with on average 21.38 rai cropland a high asset endowment and their average years of schooling is with about five years also relative high. In addition, on average only 9 % of the household members are not working due to age or unemployment compared to 33 % in the group of households who are classified as poor irrespective of the household definition. Thus, to classify these households as poor does not capture the realities and would lead to an inclusion error since they seem to be quite well-off.

Table 27: Comparison of household characteristics for groups of households eligible for poverty reduction support subject to household definition

Households	(1) poor for all definitions	(2) not poor under definition A but for others	(3) never poor
Dependency ratio[a]	1.06	0.49	0.29
Mean education in years[a]	3.81	5.27	5.77
Mean of cropland in rai[b]	11.38	21.38	20.25
Mean per cent of individuals per HH working in/as:			
Own agriculture[a]	35	15	30
Farm labourer[a]	6	11	11
Non-farm labourer[a]	7	38	26
Elderly and unemployed [a]	33	10	9
Number of HHs	18	8	34

Notes: N_{HH}=65. The statistics are only for those households that have at least one household member for all household definitions. [a] The household level statistics are based on definition A and the PPL. [b] For these variables we cannot differentiate ex-post between the definitions. The interviews were based on the multi-location definition A and thus also the statistics presented here.

Source: Author's calculations based on household survey 2008

To decide which household of the village would be eligible for poverty reduction programmes, we also use a second inclusion criterion, i.e. the household belongs to the lowest net income quintile (see Table 19), and test the implication of the chosen household definition. Results show that 44 households would never belong to the included households of this programme. Only seven households are always categorised in the lowest net income quintile while for 14 households the household definition effects if these households would be included or excluded.

Summarising this section, we can show that the household definition is decisive for inclusion or exclusion in public programmes that aim to reduce poverty. The analysis in this section suggests that inclusion or exclusion errors are affected by households at the margin, i.e. households who switch between inclusion and exclusion in the programme depending on the household definition. The application of the wider household definition A in comparison to the other three household definitions seems to exclude only those households who are anyway better-off based on their characteristics. Hereby, inclusion errors could be reduced which would save public spending and thus increase cost effectiveness.

6.5.3 Effect on social protection programmes

The break-up of traditional family structures and lack of pension schemes for the aged in rural areas has prompted the government to implement social protection programmes which support the elderly. This chapter aims to test the effect of the household definition on two types of such a social protection programme. Type a) is based on the 500 THB Universal Pension Scheme where every individual who is 60 years or older receives 500 THB per month (see Table 19) (Sakunphanit & Suwanrada, 2011). We included this programme to account for the fact that "Thailand is gradually moving from a targeting approach to universalism. For both health and elderly-income allowances, the country previously used a targeting approach because of fiscal constraints" (Sakunphanit & Suwanrada, 2011, p. 412). Table 28 shows that the number of elderly above 60 years does not differ much among the four household definitions. Therefore, the yearly transfer payment to the elderly for this social protection type a) ranges from 162,000 THB for definition D to 180,000 THB for definition A and B.

The social protection type b) is similar to the former Thai old-age allowance system. An individual receives support by this programme if she is 60 years or older and belongs to a poor household (see Table 19). Thus, also this analysis demands for a poverty line. We will again apply the PPL. Results presented in Table 28 reveal that 13 households are eligible according to definition A and 16 for definition B and C. Thus, adding the poverty criteria to the age criteria increases the effect of the household definition on programme targeting programmes for the elderly and thus also on the difference in the transfer payments.

Table 28: Number of elderly and amount of transfer payments

Definition	A	B	C	D
Total number of elderly > 60 year	30	30	29	27
Total number of elderly > 60 years and HH below PPL	13	16	16	17
Total payment per year (in THB) for				
Programme variant a)	180,000	180,000	174,000	162,000
Programme variant b) (PPL)	31,200	38,400	38,400	40,800
N_P	303	217	200	185

Source: Author's calculations based on household survey 2008

In general, we can summarise that targeting programmes that aim to support the elderly are least affected by the choice of the household definition especially if "old age" is chosen as inclusion criteria. This finding is in line with results of other studies which showed that especially the old and the very young stay in the villages while the economically active

population of the villages migrate in order to find employment (e.g. Funahashi, 1996). Thus, the criterion, i.e. minimum days an individual has to be present in the household in the household definition (see Table 18), is less decisive for old persons who anyway stay in the village for most of the year.

6.6 Summary and conclusions

This paper analysed the relationship between targeting for rural development, poverty reduction and social protection programmes and the choice of the household definition in Asian emerging market economies using Thailand as an example. We used the case of a village as potential programme intervention area to assess the implications of four alternative household definitions commonly used in development studies on the targeting effectiveness of three development programmes.

Results showed that the choice of the household definition matters for all types of interventions but is most important for rural development and poverty reduction programmes. The application of the HCR and the PGR as inclusion criteria, make results sensitive to the chosen poverty benchmark. Social protection programmes aiming to support the elderly are least affected by the chosen household definition.

Based on our findings, we argue that the definition D which is currently used by the Thai government does no longer meet the conditions of rural livelihood strategies. It is based on a household definition that fails to capture the realities of rural households in many Asian emerging market economies not only in Thailand. Rural livelihoods of even the poor people in developing countries are no longer solely dependent on farming and have become more mobile and much less localised as in the past (e.g. Rigg, 2006). Excluding seasonal and temporary migrants from the rural household tends to overestimate poverty and inequality and thus can lead to identification errors when determining the target population of rural development and poverty reduction programmes.

By sticking to an unrealistic household definition, the Thai government underrates the self-help capacity of rural households. On the contrary, applying a broader definition based on a multi-location household concept (definition A) will contribute to a more efficient use of public funds.

It is interesting to note that households excluded under definition A have a similar human capital and enjoy a similar resource endowment as those who are excluded from poverty

interventions under all household definitions. Applying definition A can therefore help to increase cost effectiveness of intervention programmes. Our analysis showed that public spending can be saved by adopting definition A that better reflects the multi-location pattern of households. If the aim is to lift all poor households of the village out of poverty considerably less money would be needed using definition A compared to D. We conclude that government agencies who are responsible for rural development and poverty reduction programmes should reconsider the currently used household definition. The change would be of advantage from a public finance point of view and would better reflect the reality of village life in emerging market economies. Thus identification errors will be reduced and the cost effectiveness enhanced.

7 SYNTHESIS

This research was undertaken with the objective to provide more insights into how social networks, migration and the households' environment relate to poverty and vulnerability in transforming countries such as Thailand. In addition, the thesis aimed to make a contribution to data collection methods in poverty and vulnerability research by developing and applying methods to collect data about social networks and migration in the context of a village case study and by testing how the definition of a household, which is the central unit of observation, impact data collection procedures, analyses and policy programmes.

The specific objectives of this thesis which were addressed in three different essays are the following:

1) to contribute to a better understanding of the role of villages in emerging market economies such as Thailand, namely (a) to describe the socio-economic conditions of a typical rural village in Thailand including the economic activities in the village and those of migrant household members, (b) to compare the well-being of households whose main income source is farming with those who rely on transfer payments from their migrant household members and (c) to identify the effects of different macro-economic conditions on multi-location households in the context of the village case study,
2) to provide a deeper knowledge of the role of social village networks for poverty and vulnerability reduction in Thailand, namely (a) to identify the extent of social exclusion for different relation types (information, support and informal insurance networks), (b) to identify the pattern of multiplexity, i.e. the degree to which individuals who interact for one relation type also interact for another one, and (c) to investigate factors that determine the formation of village information, support and informal insurance networks at the household and at the individual levels and
3) to assess the implications of household definitions on the identification error when determining the target population of programme interventions under the conditions of highly mobile village populations related to rural-urban migration which is typical for emerging market economies.

7.1 Conclusions and policy recommendations

The analyses and results of this research are based on a case study of a village in the northern province Phetchaboon in Thailand. By adopting an intensive case study approach, non-sampling errors have been reduced as information was verified through an in-depth survey process that is rarely undertaken in large scale socio-economic surveys. The data collection method which was applied is a unique approach that combined a complete enumeration of all village households in 2008 and 2009 with a social network and migrant survey at individual level in 2009. The approach simultaneously collected detailed household data at different locations in order to fully capture the social and economic interactions between village and migrant household members of multi-location households, and its impact on poverty and vulnerability.

The descriptive and empirical evidence of the thesis increased the understanding of the parallel changes in Asian emerging market economies induced by the rural-urban transformation. Several conclusions and recommendations can be derived from these findings.

Rural village households are no longer purely dependent on farming but have diversified their income sources for income growth and risk reduction. Empirical results of the study revealed that, depending on the macro-economic conditions, migration-oriented livelihood strategies have a positive effect on the well-being of village households. In times of economic growth, remittances from younger migrants provide an efficient way of rewarding elder family members for raising the migrants' children in the village. A migration-oriented strategy however bears considerable risks. Once the economy stalls, migrants tend to fail because of low education and poor social protection schemes. Their resource base in the city or place of work is rarely enough to cope with an economic crisis. Migration-oriented strategies are not the only successful alternative. The study also showed that agricultural strategies of households who have accumulated land and made technology investments to intensify their production have similarly positive effects in improving village well-being. To effectively reduce income disparities and poverty in Asian emerging market economies, rural development policies need to be strongly oriented towards the actual livelihood systems of village households in rural areas. Policy makers should therefore support successful livelihood strategies. For example, it is of limited use if the policy makers offer agricultural projects

subsidising part-time farming households. Instead, investment programmes tailored to full-time farmers would enhance the efficiency of modern agriculture and facilitate further structural change in farming practices. In addition, the findings of the study support the World Development Report 2008 recommendations to foster programmes that support investments in labour-intensive and high-value full-time agriculture linked to the rural non-farm sectors. This would help to generate additional rural job opportunities for households to further diversify their income portfolio (The World Bank, 2007).

Migration and other facets of the rural-urban transformation induce deep changes in the social structure of Asian villages. The results of the Thai case study showed that village families transform into multi-location households as a consequence of out-migration where mainly the children and elderly remain permanent residents of the village. Thus, social policies need to account for the needs of the new living arrangements where grandparents take care of the grandchildren while the parents migrate. Schools could, for example, provide offers to support the children with their homework if the grandparents are not able to do so due to old age or low education. Furthermore, there is a need to more critically assess the quality of education of village schools and perhaps consider the establishment of more centralised all-day schools instead of poorly equipped village schools. This would also help to enhance the future prospects of children to gain better employment.

The analyses of the social networks revealed that migrants maintain strong social ties with their natal household and are rather reluctant to develop new networks in urban areas. Thus, social protection programmes that recognise the orientation of migrants with their natal village are needed. One such measure could be the establishment of village pension funds. In addition, there is evidence that migrants are supported by their natal household in times of crisis. Comparing reverse remittances from the villagers to the migrants before and after the economic crisis and Thailand's political problems in 2008 showed that the amount doubled and the number of migrants who received monetary support increased after the crisis. These results are in line with findings of the DFG Research Unit 756 who also pointed at the low level of legal protection and the small proportion of insurance contracts of Thai migrants (e.g. Amare et al., 2012). Hence, social protection programmes for migrants need to be improved. A barrier to such a recommendation is that temporary migrants leave and return to the natal

household several times of the year, a situation which is not accounted for by the rigid Thai registration record system (Fairclough, 1995 cited in Rigg, 2001, p. 68). Thus, there also needs to renew the Thai registration record system in order to account for the frequent changes of the location by a large part of the Thai population. An additional benefit of reviewing the Thai registration record system is that it may reduce coverage error in surveys since the sampling is normally based on the registration records and avoid inclusion or exclusion errors in targeting programmes.

Another related issue is that the decision about the target population of Thai rural development, poverty reduction and social protection programmes are based on statistics of the NSO which apply a very restrictive household definition. Analyses in this thesis, which investigated the relationship between targeting for different policy interventions and the choice of the household definition, showed that the applied household definition mattered for all types of interventions. According to the Thailand definition, an individual is only part of the household if she is present for 270 days during a year. Migrants who very frequently change their location might therefore neither be captured in the rural nor in the urban areas where they work. To account for the reality of village life in emerging market economies and to reduce identification errors and enhance the cost effectiveness of public spending, the Thai government could make use of the self-help capacity of rural households and apply a subjective multi-location household concept where the household head decides about the inclusion of the household members.

Descriptive statistics of the village case study revealed that although the households diversified their livelihood strategies, they remain vulnerable to shocks such as job loss, loss of harvest due to drought or flooding or death of animals as a result of the avian influenza for instance. The level of insurance however is generally low. Thus, most village households cannot rely on formal insurance mechanisms in order to deal with such shocks. Informal social relations and insurances schemes constitute one of the main strategies of dealing with risks and shocks. However, not every household can rely on informal social relations but might be excluded. Indeed, the analyses of the complete network data revealed that the social network density is very low and that, depending on the relation type, up to 30 % of the households are excluded from the social networks. Although, social exclusion seems to be unrelated to ex-post income poverty, households may still be vulnerable to poverty. Furthermore, results showed that most

households rely on the same network partner for different relation types so that personal conflict could easily destroy the complete informal support system. In addition, the dyadic regressions revealed that the poor must rely on the poor and cannot expect to get help from the better-off. Thus, due to the low well-being of the informal insurance partner, there is a risk that also the informal insurance network would fail to provide help in the case of a monetary shock. Thus, policy interventions are needed that increase the access to and coverage of formal insurance schemes to especially assist those excluded from the informal insurance mechanisms.

7.2 Further research

Further research is needed to provide answers to additional questions raised in the thesis. The data already collected for this study has the great potential to further explore some of the issues, whilst for other topics additional data collection is needed.

First, further research is required to investigate which factors cause social exclusion and how social exclusion relates to poverty and vulnerability. The current data set allows analysing which household or individual characteristics increase the likelihood of being connected using the in-degree or the out-degree as dependent variable. While the in-degree refers to the number of ties per relation type a household receives from another, the out-degree refers to the number of ties the household sends to other households (see chapter 5.6).

Second, the analyses presented in this thesis reveals that multiplexity is very high, i.e. the individuals choose the same individuals for different relation types. Most studies focused on only one network type (e.g. remittances flows, information exchange) and do not investigate the overlap between them (e.g. McPherson et al., 2001). Thus, the data set offers great potential to further investigate why multiplexity is so widespread and whether the low diversification in network partners makes households better or worse off.

Third, a longer time span of observations is necessary in order to measure changes in social and economic conditions of the village. It is therefore recommended to repeat the interviews with village households and migrants after a period of time, perhaps five years. Such a data set would enable studying how social relations evolve over time and how these changes affect the

village economy. It would also be interesting to investigate if multi-location households remain the dominant living arrangement in rural areas and if temporary migrants persist strongly tied to their natal household if working and living situations in the city improve.

Fourth, to fully understand the impact of social networks on poverty and vulnerability, a high sample size is needed. Most large scale surveys however lack detailed data about the social capital. To avoid a weak proxy, e.g. a dummy variable equal to one if at least one member is part of a socio-political organisation, this study recommends data should be collected on the in-degrees and out-degrees for different relation types. Also in large scale surveys this can easily be implemented by asking the respondents to name the individuals she relies on in cases of a shock or to receive information. Using such data, social capital could be incorporated in the asset-based poverty approach by Carter and Barrett (2006) and in the asset-based vulnerability approach by Chiwaula, Witt, and Waibel (2011).

Finally, to reduce non-sampling errors or explore certain definitions of data collection techniques, it is advisable to make use of the synergies between village case studies and large scale surveys by the application of the multiple methods design proposed in chapter 2.2. For example, it would be useful to apply the proposed multi-location household definition in large scale surveys in order to verify the results presented in chapter 6 concerning the multi-location household definition. Furthermore, the lessons learned during the intensive data collection in small scale case studies can provide useful information to reduce non-sampling errors in large scale socio-economic surveys and test survey techniques.

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APPENDIX

Appendix 1: Selection of large scale surveys and censuses

Location	Name	Organisation	Time	Data structure	Source
Thailand	Household Socio-Economic Survey, until 1968 Household Expenditure Survey	NSO	since 1957, 1968 – 1969 every 5 years, since 1987 every 2 years	Household survey – repeated cross-sections (about 32,000, until 1994 16,000 HH) Multi-stage stratified random sample	NSO webpage[34]
Thailand	Population and Housing Census, until 1970 Population Census	NSO, until 1960 Ministry of the Interior	since 1909, every 10 years	Household census Sample census enumeration technique (main characteristics for all, details asked for a sample)	NSO webpage[35]
Thailand (Lop Buri, Chachoengsao, Sisaket, Buriram, since 2003 Satun and Yala, since 2004 Phrae and Petchaboon)	Townsend Thai Project	Robert M. Townsend and others	since 1997	among others: Village headman surveys: 1997 & 1998 (192 study villages) Household survey: 1997 (2,880 HH) & 1998 (1/3 of sample) Monthly household panel survey in 16 villages: 1998 (720 HH) Random stratified sample BAAC group interviews: 1997 & 1998 (262) Village financial institutions: 1997 & 1998 (161) Enterprise panel survey: 2010 (2,000 HH)	project webpage[36]
Thailand (Nang Rong district)	Nang Rong Projects 1) Community Based Integrated Rural Development project (CBIRD) Evaluation Project: 1984, 2) Demographic Responses: 1993-2004, 3) Population Dynamics, Landscape Patterns and Environmental Changes: 1995-1999, 4) Soil, Water, People, and Pixels: 1997-2000, 5) Complexity	various	since 1984	among others: Community village survey: 1984 (51 study villages), 1994/95 & 2000/01 (330 villages of Nang Rong) Household panel census of 51 study villages: 1984, 1994/95 & 2000/01 (about 7,300 HH) Social household network surveys: 1994/95 & 2000/01 Migrant tracking and social network surveys: 1994/95 & 2000/01 (about 1,900 permanent migrants from 22 of the study villages -	project webpage[37], (Rindfuss et al., 2004)

[34] See http://web.nso.go.th/eng/stat/socio/socio.htm (accessed on July 13, 2012).
[35] See http://web.nso.go.th/en/census/poph/cen_poph90.htm and http://web.nso.go.th/en/census/poph/cen_poph.htm (accessed on July 13, 2012).
[36] See http://cier.uchicago.edu/ (accessed on July 13, 2012).
[37] See http://www.cpc.unc.edu/projects/nangrong (accessed on July 13, 2012).

	Theory: 2001-2005, 6) Complexity Theory 2: 2001-2005, 7) Social Networks and Migration: 1999-2004			limited to Greater Bangkok area, Eastern Seaboard, city Korat, provincial capital Buriram)	
Thailand (Buriram, Nakhon Phanom, Ubon Ratchathani), Vietnam (Ha Tinh, Thua Thien Hue, Dak Lak)	DFG Research Unit 756	Universitys of Hannover, Göttingen, Frankfurt & Giessen	Project Phase I: 2006-2009 Project Phase I: 2010-2012	among others: Village head survey: 2007 & 2010 (440 study villages) Household panel survey: 2007, 2008 & 2010 (about 4,400 HH) Three-stage cluster sampling design Migrant tracking survey: 2010 (about 643 temporary migrants in Thailand - limited to Greater Bangkok area - & 299 in Vietnam – limited to Ho Chi Minh City)	project webpage[38], (Amare et al., 2012; Klasen & Waibel, 2012; Nguyen Duc et al., 2012; Waibel et al., 2005, 2009)
Vietnam	Household Living Standard Survey (VHLSS), before 2002 Vietnam Living Standard Survey (VLSS) & Multi-Purpose Household Survey (MPHS)	Vietnam General Statistics office (GSO) with technical & financial assistance of the World Bank & others	VLSS: 1992/93 & 1997/98 MPHS: 1994, 1995, 1996, 1997, 1999 VHLSS: 2002-2010 every 2 years	among others: VLSS Household surveys: 1992/93 (4,800 HH) & 1997/98 (6,000 HH) Three-stage cluster sampling design MPHS Household surveys: 1994 - 1997 (45,000 HH) & 1999 (25,000 HH) VHLSS Household surveys: 2002 (75,000 HH), 2004 (45,000 HH), 2006 (45,945 HH), 2008 (45,945 HH) & 2010 (69,360 HH) – always parts of sample interviewed about income & expenditure and others only about income Three-stage stratified cluster design as master sample with rotating samples on the second level (enumerator areas)	GSO webpage[39], (General Statistics Office (GSO), 2008, 2010; Phung Duc & Nguyen, 2004; The World Bank, 1994, 2001)
Tanzania	KHDS and Migrant Tracking Survey	The World Bank, MUCHS & others	Baseline: 1991-1994 Resurveys 2004 & 2010	Household panel survey: 4 waves 1991-1994 (915 HH) Migrant tracking survey (split-off HH originating from the baseline HH): 2004 (2,700 HH) & 2010 (3,300 HH)	survey webpages[40], (Beegle et al., 2006, 2008; The World Bank, 2004; De Weerdt & Hirvonen, 2012)

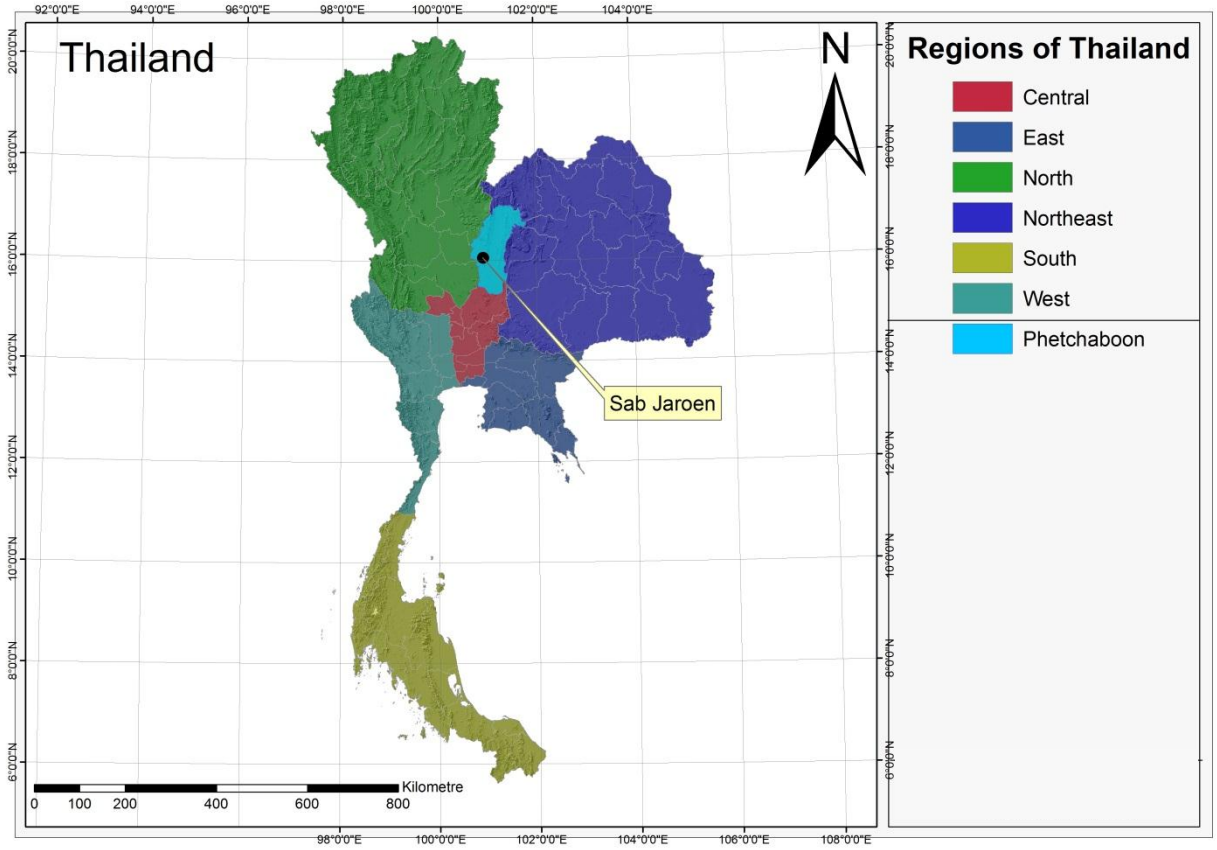
Source: Author's illustration based sources listed above

[38] See www.vulnerability-asia.uni-hannover.de (accessed on July 13, 2012).

[39] See http://www.gso.gov.vn/nada2/ddibrowser/?id=23#overview (accessed on July 13, 2012) for 1992/93 VLSS, http://www.gso.gov.vn/default_en.aspx?tabid=483&idmid=5 (accessed on July 13, 2012) for surveys since 2002, http://www.gso.gov.vn/nada2/ddibrowser/?id=20#overview (accessed on July 13, 2012) for 2002 VHLSS, http://www.gso.gov.vn/nada2/ddibrowser/?id=21#overview (accessed on July 13, 2012) for 2004 VHLSS and http://www.gso.gov.vn/nada2/ddibrowser/?id=22#overview (accessed on July 13, 2012) for 2006 VHLSS.

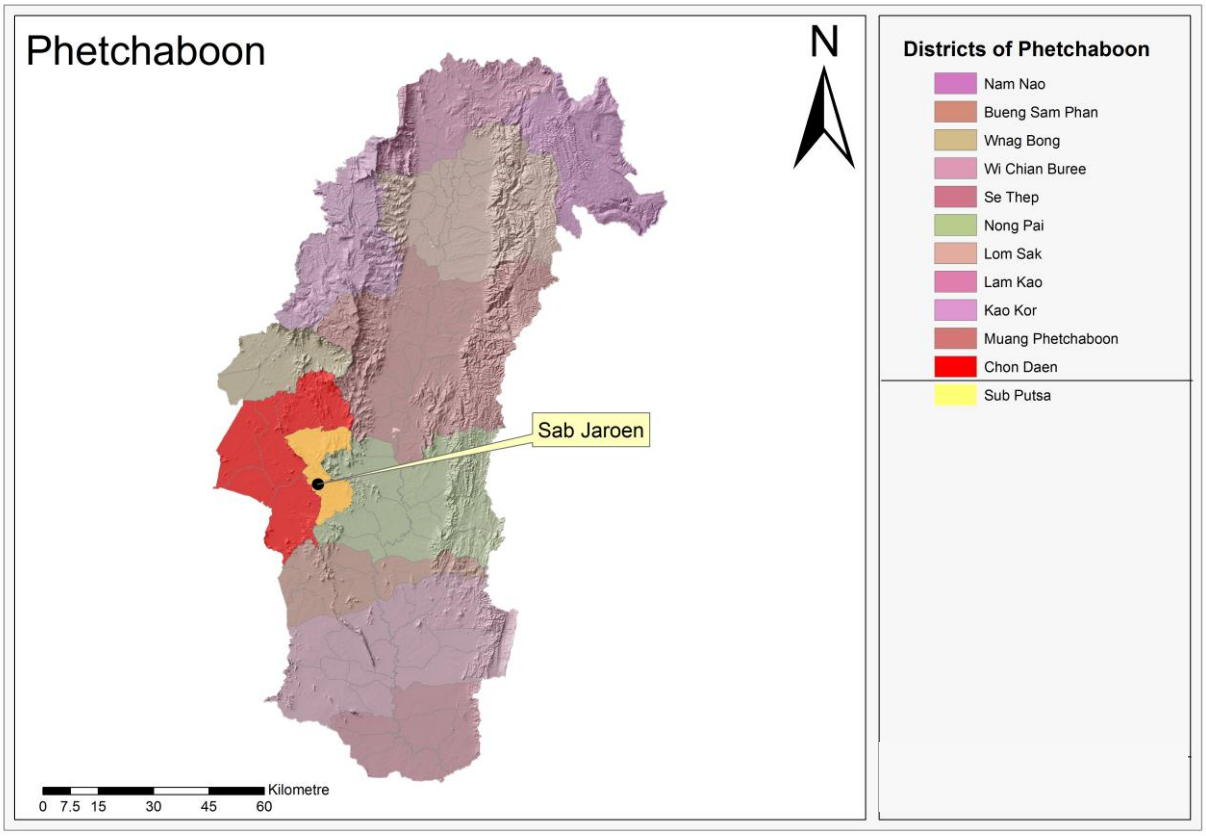
[40] See webpage of project extension of resurvey in 2010: http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTPROGRAMS/EXTKNOWLEDGEOFCHANGE/0,,contentMDK:23000853~pagePK:64168182~piPK:64168060~theSitePK:491543,00.html (accessed on July 13, 2012).

Appendix 2: Location of the village Sab Jaroen in Thailand



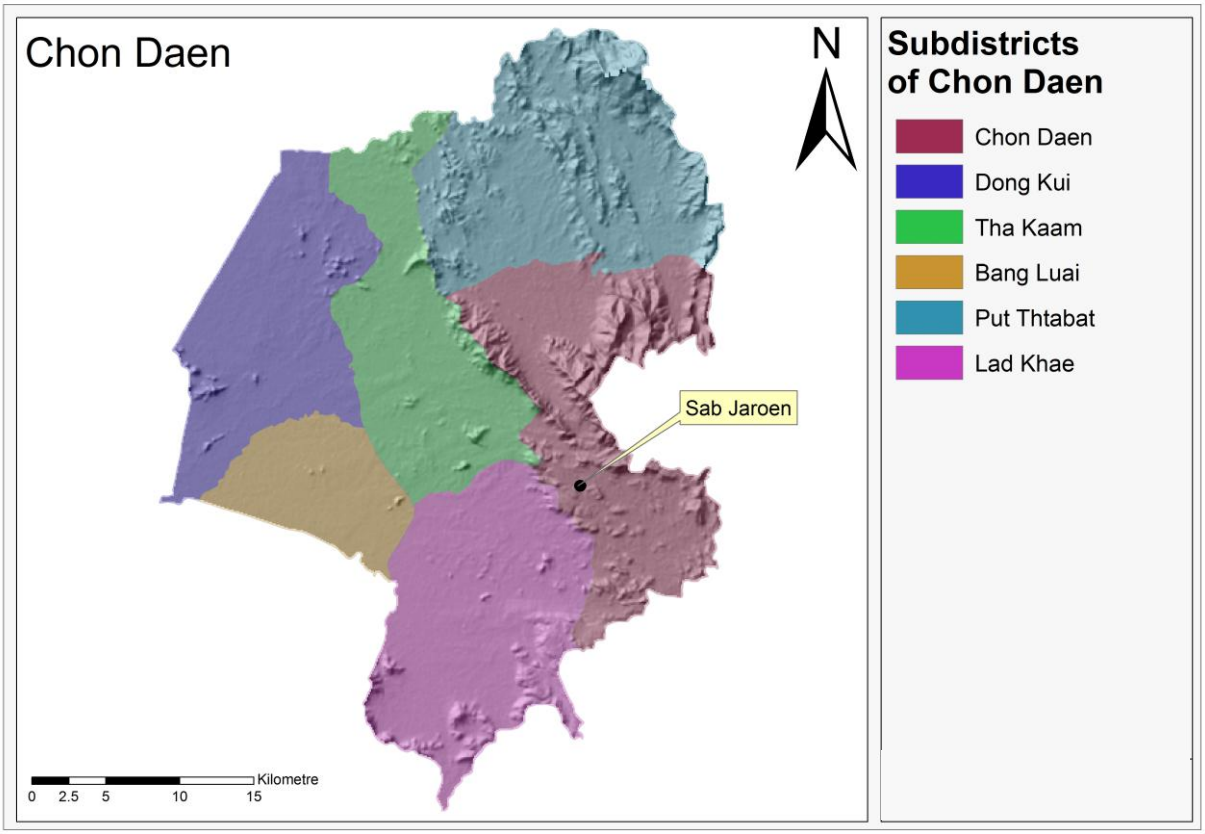
Source: Author's illustration using data from Land Development Department (LDD) (2001)

Appendix 3: Location of the village Sab Jaroen within the province Phetchaboon



Source: Author's illustration using data from LDD (2001)

Appendix 4: Location of the village Sab Jaroen within the district Chon Daen



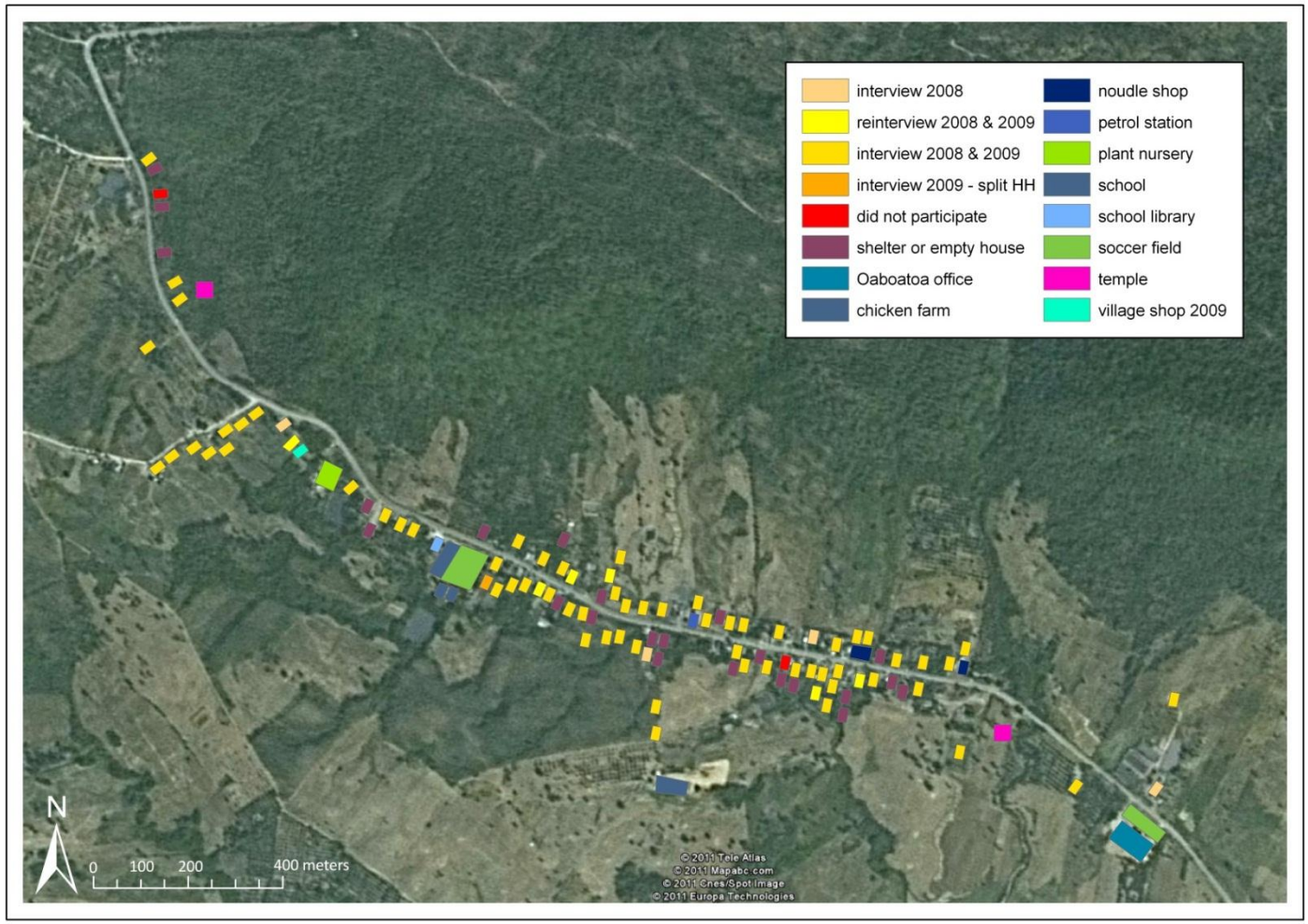
Source: Author's illustration using data from LDD (2001)

Appendix 5: Overview of documents and protocols of (MLG, 1995-2009)

- Village fund records
- Official borrowing records from 2538-2552 (1995-2009) of the village provided by the village headman
- List of the members of the Bio-fertiliser group
- List of the members of the committee of good corn species group
- 4 different inconsistent lists of the members of the Black ginger project 2550 (2007) (13/10/2007)
- List of the members of the Black ginger project 2551 (2008) dated 13/5/2008
- List of members of the handicraft group 2550 (2007)
- Conference protocol of handicraft group on 7/8/2008
- List of members of the handicraft group 2551 (2008) dated 7/8/2008
- List of the members of the Committee of Poverty Alleviation Project 2550 (2007)
- Document to ask for permit to pay a loan according to the poverty alleviation fund 2552 (2009) dated 18/5/2009
- List of the members of the committee of the Savings group (SG)
- Official protocol of the village committee meeting on Wednesday 13/6/2007. No. 5/6/2007 Sab Jaroen Temple
- List of the members of the village committee 2550 (2007)
- List of village coordinators
- Protocol of the meeting from the village committee
- List of volunteers for Residents Protection
- Document for loan and transfer to borrower's account of village fund 1 2545 (2002) dated 9/10/2002
- Document for loan and transfer to borrower's account of village fund 2 2551 (2008) dated 20/11/2008
- Divided money. Village fund list 2551-2552 (2008-2009)
- List of households who borrowed money from the village saving fund 2551 (2008) dated 8/1/2009
- List of households who borrowed money from the village saving fund 2551 (2008) dated 20/1/2009
- Official village lists

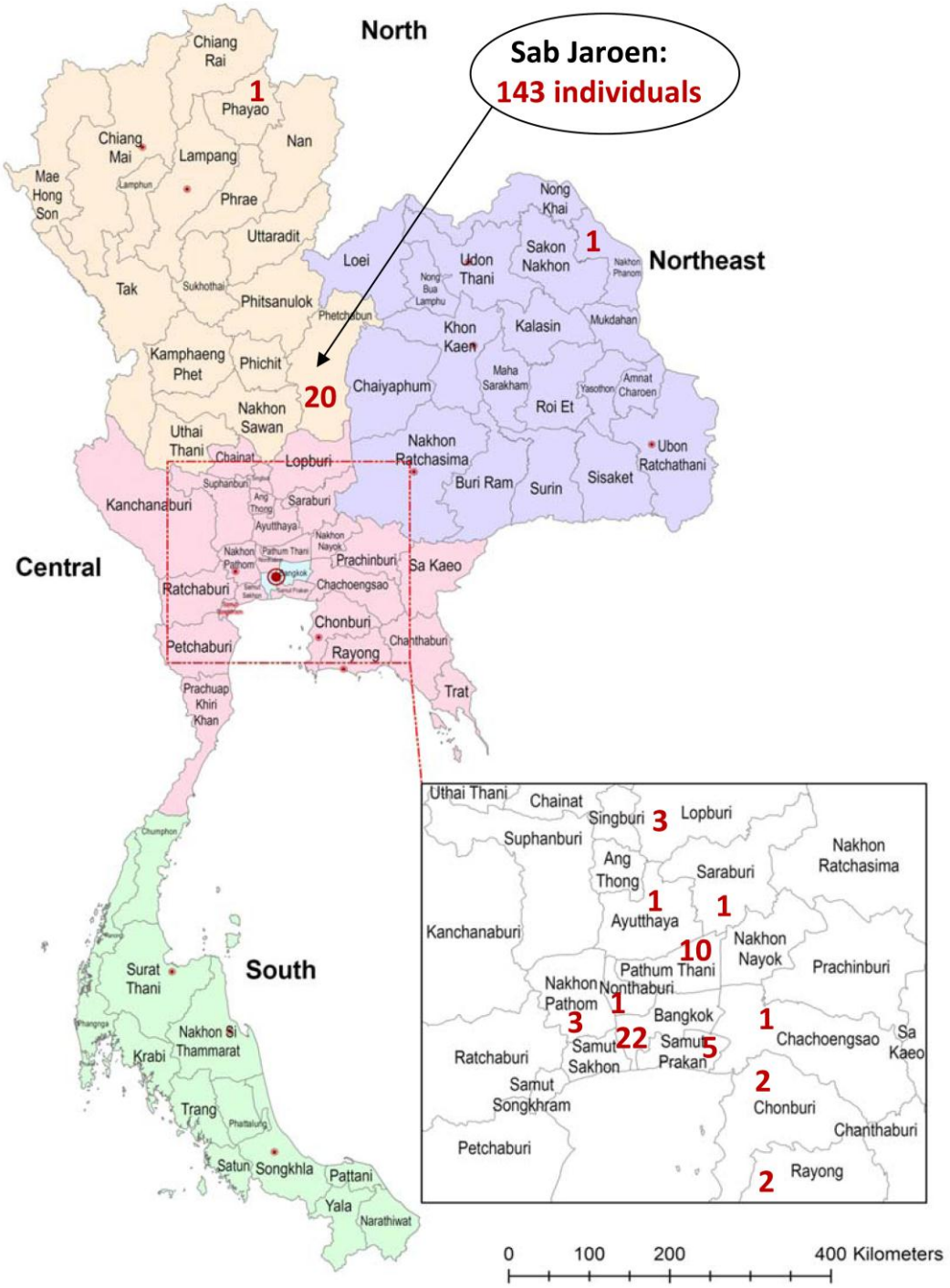
Source: Author's illustration

Appendix 6: Map of village Sab Jaroen



Source: Author's illustration using a picture from google earth as a background (accessed on December 13, 2011)

Appendix 7: Interview location of social network and migrant interviews



Source: Author's illustration, map taken from Hardeweg (2008, p. 218)

Appendix 8: Definition of variables used in the dyadic regressions at the household level

Variable	Definition
Kinship	Dummy variable, equal to 1 if at least one member of household "1" is kin to at least one member of household "2", 0 otherwise
Friendship	Dummy variable, equal to 1 if at least one member of household "1" is friend with at least one member of household "2", 0 otherwise
Neighbours	Dummy variable, equal to 1 if the houses are located next to each other in the village, 0 otherwise
Same gender of household head	Dummy variable, equal to 1 if the households heads of both households have the same gender, 0 otherwise
Both in highest 2 income quintiles (t-1)	Dummy variable, equal to 1 if both households are in the highest two net income quintiles (t-1)
Both in lowest income quintile (t-1)	Dummy variable, equal to 1 if both households are in the lowest net income quintile (t-1)
Household size	Number of household members
Mean age (years)	Mean age of household members in years
Mean education (years)	Mean of years of schooling for household members above 14 years in years
Percentage of migrants	Percentage of migrant household members
Number of own agriculture	Number of household members engaged in own agriculture as main occupation
Number of farm labour	Number of household members working as farm labourer as main occupation
Number of non-farm labour	Number of household members working as non-farm labourer as main occupation
Number not working	Number of household members not working (housewife, unemployed, unable to work, performing only light work)
Number of village committee members	Number of household members in the village committee
In-degree from households $\notin$ N_{HH} for respective relation type k	Number of ties from households outside the network boundary ($\notin N_{HH}$) for the respective relation type k
In-degree to households $\notin$ N_{HH} for respective relation type k	Number of ties to households outside the network boundary ($\notin N_{HH}$) for the respective relation type k

Source: Author's illustration

Appendix 9: Definition of variables used in the dyadic regressions at the individual level

Variable	Definition
Husband/wife	Dummy variable, equal to 1 if individual "a" and "b" are husband and wife, 0 otherwise
Brother/sister	Dummy variable, equal to 1 if individual "a" and "b" are brother and sister, 0 otherwise
Parent/child	Dummy variable, equal to 1 if individual "a" and "b" are parent and child, 0 otherwise
Grandparent/-child	Dummy variable, equal to 1 if individual "a" and "b" are grandparent and grandchild, 0 otherwise
Friendship	Dummy variable, equal to 1 if individual "a" and "b" are friends, 0 otherwise
Same household	Dummy variable, equal to 1 if individual "a" and "b" belong to the same multi-location household, 0 otherwise
Number of phone calls	Number of phone calls in the last year
Number of visits	Number of visits in the last year
Same gender	Dummy variable, equal to 1 if both individuals have the same gender, 0 otherwise
Both villagers	Dummy variable, equal to 1 if both individuals are villagers, 0 otherwise
Both migrants	Dummy variable, equal to 1 if both individuals are migrants, 0 otherwise
Both own agriculture	Dummy variable, equal to 1 if both individuals are engaged in own agriculture as main occupation, 0 otherwise
Both farm labour	Dummy variable, equal to 1 if both individuals working as farm labourer as main occupation, 0 otherwise
Both non-farm labour	Dummy variable, equal to 1 if both individuals working as non-farm labourer as main occupation, 0 otherwise
"b" government official	Dummy variable, if the sender "b" is a government official
Age (years)	Age in years
Education (years)	Years of schooling
In-degree from individuals ∉ N_{HH} for respective relation type k	Number of ties from individuals outside the network boundary ($\notin N_{HH}$) for the respective relation type k
In-degree to individuals ∉ N_{HH} for respective relation type k	Number of ties to individuals outside the network boundary ($\notin N_{HH}$) for the respective relation type k

Source: Author's illustration

Appendix 10: Distribution of dichotomous variables of household model

Variable	Value	Dyads ($N_{HH,D}$= 4,830)	Per cent
Kinship	1	228	4.72
	0	4,602	95.28
Friendship	1	248	5.13
	0	4,582	94.87
Neighbours	1	282	5.84
	0	4,548	94.16
Both households in the highest 2 income quintiles	1	702	14.53
	0	4,128	85.47
Both households in the lowest income quintile	1	210	4.35
	0	4,620	95.65

Source: Author's calculations based on social network survey 2009

Appendix 11: Distribution of dichotomous variables of individual model

Variable	Value	Dyads ($N_{P,D}$= 46,440)	Per cent
Husband/wife	1	162	0.35
	0	46,278	99.65
Brother/sister	1	222	0.48
	0	46,218	99.52
Parent/child	1	264	0.57
	0	46,176	99.43
Grandparent/-child	1	28	0.06
	0	46,412	99.94
Friendship	1	306	0.66
	0	46,134	99.34
Same household	1	586	1.26
	0	45,854	98.74
Same gender	1	23,274	50.12
	0	23,166	49.88
Both villagers	1	20,880	44.96
	0	25,560	55.04
Both migrants	1	4,970	10.70
	0	41,470	89.30
Both own agriculture	1	3,906	8.41
	0	42,534	91.59
Both farm labour	1	1,260	2.71
	0	45,180	97.29
Both non-farm labour	1	3,782	8.14
	0	42,658	91.86

Source: Author's calculations based on social network survey 2009