Farming Systems and Rural Out-Migration in Nang Rong, Thailand and Chitwan Valley, Nepal

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Abstract

Using data from two post-frontier rural settings, Nang Rong, Thailand (N=2,538) and Chitwan Valley, Nepal (N=876), this paper examines agricultural push factors determining the out-migration of young people age 15 to 19. We focus on different dimensions of migration, including distance and duration. In contrast to existing studies that focus mainly on land holding size, our study examines a wide array of agricultural determinants, each with its own potential effect on migration. These determinants include land tenure, crop portfolios, animal husbandry activities, and use of farm inputs. We examine these determinants using separate models across settings. Our results indicate that agricultural factors are significant determinants of migration. However, different factors operate in different settings, indicating the importance of contextual variation in explaining the manner in which these factors, as well as other factors commonly associated with migration, are influential determinants of movement.

Key Words

Migration, Agriculture, Push Factors, Nepal, Thailand

Introduction

Rural out-migration is a pressing issue in many developing countries. With the closing of the agricultural frontier, a diminishing proportion of the population employed in agricultural, and uneven economic development favoring cities over the countryside, increasingly people relocate to work in urban areas, with profound implications for both urban and rural areas. Indeed, urbanization in less developed countries today is occurring as rapidly as it was in the United States and other developed countries during the first half of the twentieth century (Brockerhoff 2000). There is considerable research on the consequences of such migration from the perspective of destination areas including urban poverty, overcrowding, morbidity, and political, ethnic, and cultural conflicts between recent migrants and native populations already resident in the urban areas (Brockerhoff 2000, Castles and Miller 2003). There has also been considerable research on the role of such individual-level variables as human capital and social capital in the determinants of who migrates from rural areas and who returns (Korinek et al. 2005; Taylor and Martin 2001; Williams 2009). Further, considerable research has shown that rural push factors at the macro level (village, district or province), and variation therein, are important (Curran, Garip, et al. 2005; Garip and Curran 2010; Massey et al. 2010b). Relatively little attention has been paid to the influence of household-level farming system variation in our understanding of who migrates from rural areas where macro forces are sending a "migration" signal.

Our key argument is that within rural agricultural areas which have become sources of urban migration streams due to macro-level conditions, household-level farming variation likely influence which households send migrants to urban areas, and whether those migrants return to origin. Part of the reason is that most migration data sets, such as the Mexican Migration Project and the Latin American Migration Project are not prospective and thus make it difficult to see the effect of household-level variation in agricultural practices and assets. Farm size is an exception, and it has been shown to

affect out- and return-migration (Gray 2009; VanWey 2005). In this paper, we focus on household-level agricultural push factors as determinants of rural out-migration in two post-frontier agricultural settings – Nang Rong, Thailand and Chitwan Valley, Nepal. We use prospective data that include detailed information on key aspects of farming systems such as crop portfolios, land holding size, use of farming inputs, and aspects of land tenure. Our results point to the importance of household-level farming assets and strategies in both settings, as well as theoretically interesting contextual variations across these two settings, in explaining how features of the agricultural mosaic shape rural out-migration patterns.

Review of the Literature

We begin by discussing the wide variety of migration patterns and determinants typically associated with them. Generally, migration patterns can be distinguished according to their duration and distance. In terms of duration, much early research focused on long-term or 'permanent migration,' in which migrants moved to areas where they secured employment and settled (Todaro 1969). It was not until the 1970s that circular migration, which involves relatively short-term movement ending in return to origin areas, became recognized as a major form of mobility (Hugo 1982). Some of this migration may be seasonal, which occurs during the agricultural off-season (Bilsborrow and DeLargy 1990, Ellis 1998). Regarding distance, researchers commonly distinguish between short- and long-distance moves, with the crossing of a local administrative boundary (such as a district border) differentiating the two (see for example Massey, Axinn, & Ghimire, 2010a). While long distance moves may be necessary to take advantage of labor markets offering better work opportunities and higher wages, shorter distance moves may allow migrants to easily return if the need arises.

Regardless of the exact pattern followed, migration determinants can be grouped into three broad areas: 1) pull factors that draw migrants to destination areas, 2) intervening factors that either inhibit or facilitate movement between origin and destination areas, and 3) push factors that impel migrants to leave origin areas (Curran 2002, Lee 1966). Chief among pull factors are economic conditions, such as employment markets and wage differentials between destination and origin settings. Such economic opportunities allow migrants to maximize lifetime earnings through human capital investments and enable them to earn income that they can send to their origin families (Taylor and Martin 2001, Sjaastad 1962, Todaro 1969). Explanations for intervening obstacles focus mainly on social network ties connecting origin and destination communities. By providing information about travel, job opportunities, and housing, network ties linking former and prospective migrants reduce the cost of migration while increasing the expected benefit, thereby increasing the incidence of migration (Massey, Alarcon, et al. 1987, Palloni, et al. 2001, Curran 2002).

While contemporary migration research puts considerable effort into studying pull factors and intervening obstacles, push factors, especially agricultural ones, tend to be understudied. Furthermore, little attention is paid to how these push factors may differ across different migration streams. Previous studies of push factors have emphasized broad, and often vague, macro-level factors such as "population pressure." For example, some scholars have advanced a Malthusian explanation in which increasing population density puts pressure on agricultural systems to provide food and resources (Bilsborrow and DeLargy 1990, Bongaarts 1996, Cohen 1995, Ehrlich, Ehrlich and Dailey 1993). Migration, particularly to frontier regions, acts as an escape, or "safety valve" from the resulting limited opportunities (Turner 1893). Population pressure also leads to land fragmentation, whereby younger generations receive increasingly subdivided land inheritance. Drawing on work by Malthus (1798), Davis (1963), and Boserup (1965, 1981) Bilsborrow (1992) argued that population pressure engenders a

multiphasic response, in which migration is one possible outcome. Further exemplifying macro-level theorizing, more recent research on "environmental migration" (Hugo 1996, Myers 2002, Pebley 1998) has linked migration to a wide array of environmental factors, including climatic conditions (Findley 1994, Henry 2004, McLeman and Smit 2006), land cover and land use change (Amacher, et al. 1998, Barbieri and Carr 2005, Bilsborrow and DeLargy 1990), and perceptions of environmental degradation (Massey, Axinn and Ghimire 2010a).

Other studies of push factors have focused on market imperfections affecting households' livelihoods. This line of inquiry, perhaps best illustrated by the work of the New Economics of Labor Migration (NELM), argues that migration is part of a household strategy aimed at overcoming absent or imperfect credit, insurance, and futures markets (Stark and Lucas 1988, Lauby and Stark 1988, Taylor, Rozelle and de Brauw 2003). Having limited access to capital and insurance, rural households send migrants to act as target earners who seek other and different employment opportunities to diversify the household's income flow and to create opportunities for investment in new and risky production technologies (Stark 1991). These migrations are usually temporary, and migrants may return when their earnings target has been met.

The trouble with this household-level explanation is that it ignores variation in household agricultural practices, or farming systems, which can play a significant role determining individual migration decisions. Particularly in poor rural regions, agriculture tends to be the predominant economic activity for most households. There is a great deal of variation in the characteristics of household farming systems with respect to such things as the amount of land owned, the portfolio of crops grown, animal husbandry activities, and the types of agricultural inputs used on the farm. These factors are likely to be significant predictors of migration patterns. Moreover, many often-discussed macro-level determinants, such as population pressure and environmental degradation, unless associated with a

catastrophic event, are unlikely to influence migration directly, but rather probably have an indirect effect through agriculture[2].

While several features of household farm systems could potentially impact out-migration, thus far only one aspect, the size of land holdings, has received much attention. In the migration literature, household land holdings are viewed in three distinct ways that produce different predictions (VanWey 2005). First, land provides employment, which reduces the incidence of migration (Gray 2009, Zhao 1999). Second, land is a form of investment, which encourages short-term migration to earn money to finance agricultural inputs and to expand and/or improve existing land holdings (Jokisch 2002). Third, land is a measure of relative deprivation which encourages households to send migrants to generate income and equalize wealth within their peer group (Stark and Taylor 1989).

A sole focus on land holding size ignores the role of other factors influencing migration, such as land tenure, farming portfolio, and agricultural inputs. Land tenure can affect migration independent of land holding size. Without secure private land claims, short-term production strategies emerge, leading to unsustainable agricultural practices resulting in soil degradation and erosion (Amacher, et al. 1998). This may encourage all forms of migration, as people leave behind low-yield or marginal land. Having a more secure form of tenure, households owning land should provide better stewardship of it, which reduces the incidence of migration, except for short durations during the agricultural off season. Alternatively, less secure tenure may have the opposite effect, especially in areas where land rights depend on continual use (e.g., *Ejido* land in Mexico or collectively farmed land in rural China).

Variability in farming portfolios may also affect migration. Although risk diversification is a noted motivation for migration (Stark 1991) little attention is paid to how diversity in farming practices, or a

[2] Consider, for example, the effect of population pressure, which directly affects food production and land fragmentation, which in turn leads to migration.

farming portfolio, affects a household's risk profile. Used in reference to agriculture, a *portfolio* refers to the mix of horticulture and animal husbandry activities that households use to diversify risk and fulfill economic functions (Dixon, Gulliver and Gibbon 2001). As households plant a variety of staple, subsistence, and cash crops, and raise livestock, they lower their susceptibility to risks from crop failures, droughts, blights, famines, and downturns in crop prices. A household's crop portfolio may be sensitive to market factors, such as the opportunity to sell cash crops (Pangali 1997). By providing income, cash crops lower the need to migrate, although migrants could still move during the agricultural off-season, perhaps for short durations and distances. Households raising animals can also gain capital from selling livestock, and this too reduces the need to migrate. However, they may have difficultly sending seasonal or other types of circular migrants, since, unlike crops, animals require a year-round commitment.

Agricultural inputs are also significant. While the amount of farm yield can be negatively affected by soil fertility or salinity, agricultural inputs such as fertilizers, herbicides, and irrigation pumps can offset the effects of poor soil quality, which should make farming more productive and discourage migration. Especially in parts of Asia where rice, a heavily water-dependent crop, is widely grown (Dawe 2005), irrigation pumps are a particularly important farm input. However, in some settings, short-term migration might be necessary to earn money to purchase, maintain, or operate these inputs. In addition, mechanized inputs, such as tractors, can make farming more productive and increase all forms of migration by reducing labor demand.

Having discussed some common generalizations about how agricultural factors could influence migration, we now consider how variations in the institutional context affect this relationship. Migration research employing a cross-national comparative perspective suggests that many factors presumed to have a universal effect on migration may actually behave quite differently in distinct social settings

(Goldstein 1987, Roberts 1997, Sana and Massey 2005, VanWey 2005). Regarding agricultural factors, research has suggested that their effects vary with the influence of local conditions, such as settlement patterns affecting land tenure arrangements, the nature of agricultural systems, as well as other characteristics of the local economy and markets that affect such things as the sale and transportation of commercial crops, and the costs and benefits of migration (Bebbington 1999, Ellis 1998, Ellis and Freeman 2004, Henin 2002, Mukherjee and Zhang 2007, Peters 2006). At any given time, many of these factors are invariant within settings, but they can still be studied across settings. With that in mind, we now discuss differences in setting between Nang Rong, Thailand, and Chitwan Valley, Nepal.

Setting

Settlement Patterns. Both Nang Rong and Chitwan are recent post-frontier regions with similar patterns of settlement. Nang Rong, located in Buriram province in Northeast Thailand (near the Cambodian border), was a sparsely populated frontier in the 1950s (Rindfuss, et al. 2007). The availability of ambiguously titled land for clearing brought waves of settlers into the region until the closing of the frontier in the 1970s (Entwisle, Walsh, et al. 1998). Chitwan Valley is located in the Terai region of South Central Nepal, near the Indian border. Until the mid 1950s, Chitwan was a frontier setting covered by virgin forest, exotic fauna, and malaria-infested mosquitoes (Barber, et al. 1997). During that time, the Nepalese government, with the assistance of USAID, began a program of malaria eradication and allocation of newly cleared land (Shrestha, Velu and Conway 1993). The promise of available farmland brought an influx of migrants from the hills, neighboring districts, and from other parts of Nepal. Chitwan remained isolated until 1979, when the first all-weather roads were completed, linking Narayanghat (Chitwan's largest town) to Kathmandu and western regions of Nepal.

Agricultural Systems. Agriculture is the dominant economic activity in both regions, but its nature differs dramatically across them, which has implications for migration patterns. Nang Rong has a marginal agricultural environment with poor quality soils and drainage (Rigg 1987, 1991, Parnell 1988). The predominant subsistence crop is lowland paddy rice, which relies on water from seasonal monsoon rains. The near absence of mechanized irrigation allows for only one annual crop. The dominant cash crop is cassava, which is grown in the uplands for export to European markets (Curran 2005). Unlike rice, cassava needs little water and can be grown during droughts. Other upland crops include corn and sugar cane, which are not part of the local diet. Farmers also raise cattle, pigs, chickens, and other animals, and they cultivate small vegetable gardens. Some of the vegetables from these gardens are sold in local markets.

In contrast, Chitwan is a fertile region, considered the "bread basket" of Nepal for its rich soils and high agricultural productivity. Most land in Chitwan is devoted to agriculture, with an important distinction made between *Khet* and *Bari* land (Biddlecom, Axinn and Barber 2005, Yabiku 2006). *Khet* refers to low wetlands that are the most agriculturally productive and are usually used for growing paddy rice. *Bari* is less agriculturally productive dry upland used to cultivate other subsistence crops such as corn, millet, etc. Farming involves an intensive rotation of three annual crops, with rice being the most important crop. Residents depend on successful field cropping for much of their subsistence needs, but also supplement agriculture with a mix of animal husbandry and gathering of forest resources (e.g., firewood, and fodder for animal feed; see (Matthews, Shiavkoti and Chetri 2000).

Economic Development. Economic development levels also differentiate these two settings, which creates different patterns of migration, both internationally and domestically. Thailand is more economically developed relative to Nepal. In 1994 (the start of the Thailand time series data used here), the World Bank (2008) indicated that Thailand had a Gross National Income (GNI) per capita of $4,310,

compared to Nepal's GNI of only $690 in 1996 (the start of the Nepal time series data). Estimates show that Thailand's economy grew substantially prior to the 1997 Asian financial crisis, averaging around nine percent annual growth in its Gross Domestic Product (GDP) between 1985 and 1995 (Bello, Cunningham and Pho 1998). For Nepal, the average annual increase was roughly about five percent (WorldBank 2008).

During the 1980s and 1990s, Thailand's economic boom fueled labor migration (Warr and Nidhiprabha 1996). Rural-to-urban migration became more common than the historically more prevalent pattern of marriage-related rural-to-rural migration (Chamratrithirong, Archavanitkul, et al. 1995, Pejaranonda, Santipaporn and Guest 1995). Most of this rural-to-urban migration was to Bangkok and the Eastern Seaboard (a development zone southeast of Bangkok). Migration abroad is uncommon, and usually involves moving to other Asian countries (e.g., Taiwan or South Korea). For men, migration can be associated with military conscription and ordination as a Buddhist monk, both of which require relatively short-term commitments.

Nepal's economic situation is less favorable, and domestic employment opportunities are limited. Nepal is one of the least developed countries in South Asia (Kollmair, et al. 2006) and has one of the world's highest rates of agricultural employment (Graner 2001). Poverty, unemployment, declining natural resources, and a recent Maoist insurgency are major motivations for migration, with India, the Gulf States, the "Tiger" states, and Europe representing the primary international destinations (Thieme, Bhattrai, et al. 2005, Thieme and Wyss 2005, Seddon, Adhikari and Gurung 2002, Williams and Pradhan, Political Conflict and Migration: How has Violence and Political Instability Affected Migration Patterns in Nepal? 2009). Internal migration in Nepal is connected with frontier resettlement and the boom in the domestic carpet industry in the early 1990s, which subsided by the middle of the decade (Graner 2001). Chitwan residents migrate in roughly equal numbers domestically and abroad, with Narayanghat and

Kathmandu representing major domestic destinations. Most likely, migration differs for men and women, with the former being more involved in economic migration. Indeed, women are legally prohibited from migrating to certain locations, such as the Gulf States (Thieme and Wyss 2005).

Migration related to marriage is common in both settings, and is likely to be short-distance (i.e., within the district), rural-to-rural migration. In Nepal, the most common pattern is for the bride to move in with the groom's family following marriage. In Thailand, the stated preference is for the groom to move into the bride's family following marriage. However, the behavioral reality is that the couple tends to settle wherever resources are greatest (Chamratrithirong, Morgan and Rindfuss 1988).

Statement of the Problem

To summarize, we examine agricultural determinants of migration using not only the size of land holdings, but also other characteristics of household farm systems, such as land tenure, farming portfolios, and agricultural inputs. We use these factors to predict migration patterns, and we distinguish migrations according to duration and distance. We will investigate the relationship between agricultural factors and migration in two settings. Similarities in findings across settings imply a general pattern, while differences may suggest the influence of contextual factors.

[Table 1 about here]

Table 1 summarizes our hypotheses about the direction of influence of various household agricultural factors on migration. The table excludes expectations about context-specific factors. We expect land tenure to reduce all forms of migration, since households with secure land holding status ought to provide the best stewardship of it, and may enjoy higher yields, compared to those investing little in their unsecure land. We note that our expectations are mixed for short distance and short duration moves, since migrants can more easily return to the land if necessary, and may try to balance

migration with successful farming on secure land, especially during the agricultural offseason. We predict that a diverse crop portfolio will reduce all forms of migration because it lowers households' susceptibility to risk. In the event that households grow cash crops as a way of generating income, they are especially less likely to migrate. We make similar predictions for animal husbandry; since it requires a year-round labor commitment, it potentially lowers capital constraints through sale of animals, and it also lowers susceptibility to risk. We have mixed expectations for the use of farm inputs, such as fertilizer or irrigation pumps. Although they may increase farm yield, making farming more productive and thereby lowering the need to migrate, they could also motivate migration for earning the needed capital to operate and maintain them. Finally, we predict that farm mechanization (e.g., the use of tractors) will encourage migration, as it lowers labor demand.

Basic Approach

We develop a series of panel regression models using data from the two study sites. Migration, the dependent variable, is measured as a set of individual-level multi-category nominal variables. The first distinguishes migration by duration and the second by distance. Key independent variables are household-level measures of features of the farm system, including land holding size, land tenure, cropping portfolio, and use of agricultural inputs. Variables affecting migration that are also related to aspects of the farm system are included as controls. These include measures of migration specific-, human-, and physical capital; demographic characteristics; household socio-demographics; and community measures. In order to establish a proper time ordering of events, independent and control variables will be measured in a baseline year, while migration will be measured prospectively, as a change in residence occurring between baseline and a subsequent point in time. Specifically, individuals residing in their origin communities will be "followed" for six years after baseline to determine whether a move occurred. Our choice of six years is due to data constraints, as this is the number of years

separating data panels in the Nang Rong data. We believe it to be a reasonable choice, because it is long enough to allow most people to migrate.

We follow a "clean sample" approach, whereby we target a cohort of young people, age 15-19 (in 1994 for Nang Rong and in 1996 for Chitwan), who are likely to be too young to have migrated at baseline, but old enough to migrate in the period under investigation. Such an approach reduces sample selectivity bias by starting with a sample of people before they experienced the event. Preliminary research in both Nang Rong and Chitwan suggests that migration propensities rise in the teen years and peaks around age 20. We acknowledge that some young people begin migrating earlier, perhaps as young as age 13 (roughly an age when individuals can begin migrating independently of their parents). To account for this movement, we control for the number of migrations that an individual experienced between their age at the time of the survey and age 13.

Another consequence of such early movement is that it introduces truncation into our sample, particularly in the event that members of our sampling universe are missing at baseline. This truncation potentially introduces sample selection bias, a point we return to in the concluding section of our paper. Another source of sample selectivity is attrition after baseline, for example, when an entire household moves out of the village or neighborhood. In both data sets, these households, which would normally be lost to follow-up, were located and interviewed. As such, we include individuals from these households in our analysis. As there are too few of them to designate as a separate outcome, we treat individuals from these households as migrants.

Data from our two study settings were not collected with the intention of conducting a comparative analysis. Because there are only two study settings, and the data are not strictly comparable across these two sites, we estimate separate models for Chitwan and Nang Rong. As our

discussion below makes clear, we will take a number of steps in constructing our analysis sample and variable definitions to make them as comparable as possible. Similar variables will be included in both models and will be measured using common metrics (e.g., land measures will be converted from local measures such as *rai* or *bigha* into hectares).

Data

Data for the study come from the Nang Rong Project for Thailand, and the Chitwan Valley Family Study for Nepal. Both data sets collected information using a variety of sources during different phases of data collection. We draw on a number of features of each data set. For Nang Rong, social survey data were collected in three prospective panels (1984, 1994, and 2000). For our research, we use data from the 1994 and 2000 panels. In 1994, data were collected from 76 sample villages. A complete census of all village households was conducted, which obtained information on the characteristics of all residents and absent household members listed on the previous data panel, as well as any new members. Information was also obtained about characteristics of the household, such as farming practices, land holdings, ownership of assets, and so on. In 2000, a follow-up survey was conducted which surveyed all 1994 households remaining in the village and all new households.

As part of all of these surveys, a yearly retrospective life history calendar was collected for all individuals within a particular age range (18-35 for the 1994 household survey and 18-41 for the 2000 round). The life history calendar inquired about a variety of demographic events such as childbearing, educational attainment, occupational status, and residence from age 13 to the time of the survey for all individuals residing in the village. Data on village contexts were also collected in 1994 and 2000. Community surveys asked about land use, travel, occupations, social institutions, and other topics related to village life. Some of the analysis for the paper is also supplemented by spatial data, such as

global positioning system (GPS) coordinates, as well as remotely sensed digital images obtained from the Landsat satellite. The analytical sample includes 2,538 individuals.

For Chitwan, baseline data were collected for a sample of 171 neighborhoods in 1996 (see Barber, Shivakoti, Axinn, & Gajurel, 1997 for details). Neighborhoods are defined as naturally occurring geographic clusters of 5-15 households. Collection of these data involved several distinct phases. Once the neighborhoods were selected, a retrospective neighborhood history calendar was administered, which collected data on reported walking distances from neighborhoods to various services (such as employers, bus services, schools, health service, movie theaters, and so on; see Axinn, Barber, and Ghimire, 1997).

Following the neighborhood data collection, a land survey of all sample neighborhoods was conducted that used compasses and tape measures to acquire data on multiple land use categories. These measures were entered into a Geographical Information System (GIS) database, which was used to construct spatial variables. In addition, a household survey was conducted that includes a complete census with a relationship grid of all household members, and a survey of household consumption and agricultural practices. This household survey was then followed by an individual interview of household members age 15-59. Data at this phase were collected on topics such as family background, personal characteristics, and so forth. As part of the individual interview, yearly retrospective life history data were collected on topics such as residence, marital status, childbearing, and the like (Axinn, Pearce and Ghimire 1999). After 1997, monthly prospective updates of demographic events were collected for a random sample of 151 neighborhoods, detailing changes in residence and other demographic events. The analytical sample for Chitwan includes 876 individuals from these sample neighborhoods.

Measures

Two dimensions of migration are measured, and both define migration as a change in residence involving a move outside the sample community (i.e., village or neighborhood) lasting two or more months. The first dimension is a rough measure of circular migration versus long term migration, and distinguishes between non-migrants, return migrants, and ongoing migrants. For Nang Rong, information for this measure will come from the 1994 and 2000 household survey and 2000 life history calendar. Starting with a sample of young people residing in their sample community, non-migrants will be defined as those who did not migrate at any point between 1994 and 2000. Return migrants are those who migrated sometime between 1994 and 2000 (as indicated by changes in residence in their life history calendar), but were residing in their origin village in 2000. Ongoing migrants include those who were migrants in 2000. We acknowledge that this measure of circular migration is imperfect, given that ongoing migrants may have returned anytime within the six year window without our knowledge. The Nang Rong data does not contain sufficient information to determine this possibility for all migrants, therefore, to maintain comparability across settings we are forced to rely on a comparison of returnees and ongoing migrants, rather than a true comparison of circular and non-circular migrants. As a sensitivity analysis, we re-estimated our final model using a circular and non-circular designation for the Chitwan data, for which information on circulation is available. The results of this model were substantively similar to our other finds.

For Chitwan, migration will be measured in an analogous manner using data from the monthly prospective household registry. Table 2 shows that non-migration is less common in Nang Rong than in Chitwan, with 39 percent not migrating in the latter and only 27 percent not migrating in the former. Return migration is a bit more common in Nang Rong, which may indicate that circular movement is easier there, perhaps due to intervening factors, such as transportation, to agricultural factors, such as the shorter growing season, or to the availability of short-term employment opportunities in Bangkok,

such as in construction. Ongoing migration is also more common in Nang Rong, perhaps reflecting the nature of the labor market.

[Table 2 about here]

The second dimension is migration distance. We divide cases into those that did not migrate, those migrating short distances, and those migrating long-distances. We treat moves within Nang Rong district, or within Chitwan district, as 'short distance' moves. Moves to areas outside these regions are treated as 'long-distance.' Given marriage patterns in both settings, short distance moves are likely to be marriage-related. Long distance moves are probably more likely to be work-related. We note that Chitwan neighborhoods are smaller geographic units than Nang Rong villages, hence we are more likely to identify short-distance moves in Chitwan compared to Thailand. Thus, these measures are not perfectly comparable. Table 2 shows that Nang Rong migrants overwhelmingly migrate outside of the district, and at a much higher proportion than Chitwan migrants, who are only slightly more likely to migrate outside the district than they are to migration within it. Preliminary analysis (*not shown*) indicated that return and ongoing migrants in the Nang Rong sample had overwhelmingly migrated outside of the district. In Chitwan, returning and ongoing migrants were only slightly more likely to move outside of the district than to stay within it.

Farming variables are constructed from various survey items included in our data sets. For the Nang Rong data, respondents were asked about characteristics of all land plots owned and used by their household. Specifically, they were asked about the size, primary and secondary activity (e.g., rice cultivation, abandoned land, land for rent, etc.), and ownership status of each plot (e.g., owned, rented, mortgaged, and so forth). For Chitwan, respondents provided information about the amount of *Bari* (upland) and *Khet* (lowland) land that their household used for farming and whether the household

owned, share cropped, contracted out, or farmed either type of land through a tenant arrangement. Households could choose multiple ownership types. Separate survey items also inquired about the amount of *Khet* and *Bari* land used for growing up to four different types of crops.

We use these items to construct the following measures: 1) an overall measure of land holding size, which comes directly from the questionnaire for Nang Rong and combines *Khet* and *Bari* land size for Chitwan; 2) dummy variables for whether the household grows only rice, only cash crops, or a combination of crops, to measure crop portfolios; 3) dummy variables for whether the household engages in any of these activities independently; and 4) dummy variables for whether the household owns, mortgages, or sharecrops any land. We note that some households have multiple land plots, and therefore may have a variety of ownership statuses. Also, rented land in Nang Rong is usually paid for with in-kind payments of a portion of the crop yield, rather than in cash. As such, rented land in Nang Rong is akin to sharecropped land in Chitwan, and we treat it accordingly.

Table 3 shows that landholding size, on average, is about three-and-a-half times larger in Nang Rong (over 3.5 HA) than in Chitwan (1 HA)[3]. In the aggregate, Chitwan households have more *Khet* landholdings (0.71 HA, on average) than *Bari* land holdings (0.30 HA, on average). Almost all households

[3] In Thailand, three different metrics are used to measure land unit size: *rai*, *ngan*, and *wah*. In the 2000 data, respondents were asked to indicate the size of each parcel and to tell the interviewer specifically what metric they were using, and reported values were comparable to those derived from a 2000 GIS data base that was collected in an entirely different manner. In 1994, landholding size data was collected using only a single metric, *rai*, and there is concern that some respondents may have been reporting in a metric other than *rai*. To examine this possibility, we compared landholding sizes across the 1994 and 2000 panels for a cohort of households aggregated to the 1994 household definition in 2000. We found an average difference in landholding of just under 1 *rai* (0.16 HA) across waves (i.e., it was smaller in 1994 than in 2000), but the differences were as high as 32 HA for a few households. The first and third quartiles of the difference in landholdings were around 1.5 HA, suggesting that the middle 50 percent of the distribution had roughly comparable values. We note that some of the difference may be due to the fact that we were comparing land that was owned and used in 2000 to land that was owned in 1994, with the difference being land that was owned in 2000 but rented out to others to use. We estimated our final models with the landholding size variable omitted to see if our results were robust to this variable's effect. The results (*available upon request*) were comparable and did not change our basic conclusions. Nevertheless, we caution that the effect of the landholding size coefficient may be biased in our final models due to possible measurement error.

own land (over 90 percent in both settings), although sharecropping and mortgaging is more common in Chitwan than in Nang Rong. Crop diversification also seems to be much more common in Chitwan, perhaps due to the more intensive pattern of cropping found there. While the majority of households in Nang Rong (70 percent) grow rice alone, far fewer households do so in Chitwan (33 percent). Over half of Chitwan households grow a combination of crops, compared to only 21 percent of Nang Rong households. In both settings, growing cash crops alone is uncommon. In terms of the overall proportion growing crops, almost two-thirds of Chitwan households grow rice, compared to 91 percent of Nang Rong households. Under a third of Chitwan households grow any cash crops, compared to 17 percent of Nang Rong households.

[Table 3 about here]

We also include measures of the number of cattle, buffalo, and pigs owned by the household to take into account animal husbandry activities. Buffalos are traditionally used as draft animals in these settings, while pigs and cattle are used for consumption and sale. For both data sets, data for these measures come from survey items that ask specifically about these practices. The number of animals of all types is higher in Nang Rong than in Chitwan, and the difference is especially pronounced for the number of pigs raised. The difference may be due to the disparity in land holding size distinguishing these regions. To measure the use of farm inputs and mechanization, we use data on whether the household reported using an irrigation pump or a tractor. The tractor measure includes both large vehicular tractors and small walking tractors that are similar to gasoline-fueled rototillers that suburban farmers might use in developed countries. In both settings, the smaller walking tractors are far more common than the larger riding tractors. Tractor use is slightly more common in Chitwan (compare 70 percent to 60 percent), although Nang Rong households are a bit more likely to use irrigation pumps (compare 17 to 12 percent).

To account for effects of migration selectivity related to pull factors, intervening mechanisms, and other push factors, we include measures of human capital variables, potential social network connections, and community environmental characteristics. According to neoclassical economic theory, attributes that improve an individual's ability to maximize lifetime earnings (such as young age or higher education) should be positively related to migration (Taylor and Martin 2001). Educational attainment is measured as a series of indicator variables for whether a respondent attained less than six years of education, six years exactly, or more than six years[4]. Age is measured in years.

To account for possible social network influences, we follow previous research by Kandel and Massey (2002) and Massey and Espinosa (1997), and use a proxy measure of migrant capital, which we operationalize as the number of household members having migration experience prior to baseline. As mentioned earlier, we also measure whether an individual in our sample had previous migration experience since age 13. We expect that individuals with more prior migration experience, or those coming from households in which others members have migration experience, should be more likely to migrate, because they may have personal access to information, or to a network of other migrants with whom they have journeyed in the past or met at a migration destination.

We also include proxy measures for environmental factors that may indicate remoteness or better conditions for farming, which could affect the likelihood of migration. We include these as community-level variables. For Nang Rong, following work by Entwisle et al. (2005), we use the percent of forest cover located within a 3 km radial buffer around the village center. This measure is based on satellite data that was processed and ground-truthed. For Chitwan, we include a measure of the percent

[4] Six years of education represents primary schooling in Nang Rong, thus having less than six years of education implies education below primary school, whereas years above six represent education beyond primary school. In Chitwan, five years is the cut off for primary school education. To test the sensitivity of results to our definition of education, we also estimated or empirical models using a five year definition. Results (*available upon request*) were comparable for six- and five-year education definitions in both settings. In general, the five year definition dampened the education effect in both regions, and it had a slight impact on the age effect in Chitwan.

of undeveloped or common land (which includes forest). We expect that undeveloped or forest land holds the potential for further agricultural extensification, which may alleviate the effects of population pressure from dwindling land inheritances. We note that even if residents of both regions cannot legally cultivate such land, squatting and harvesting of forest resources (e.g., for firewood and animal fodder) still occurs. For both settings, we also include measures of the straight-line distance to the nearest district town and the number of years that the community had electricity to gauge the level of development and remoteness of the region. We expect that less developed or more remote areas may have higher migration prevalence, as these areas typically offer less access to local produce markets and fewer occupational alternatives to migration.

We also include controls for household wealth, household demographics, and other individual-level characteristics. To measure wealth, we use a principle components analysis (PCA) technique described by Filmer and Pritchett (2001) to construct a wealth index, based on the household's ownership of consumer assets. Since some of the variables are measured at a nominal level, we use a polychoric PCA refinement developed by Kolenikov and Angeles (2004). Because it has no natural scale, we describe this variable as a series of dummy variables. In particular, we distinguish whether a household is in the top, middle, or bottom third of the wealth distribution of all sample village households. We will also construct demographic counts of the number of household residents age 14 years or younger, 15 to 55, and 56 years or older. Qualitative fieldwork in Nang Rong has suggested that these age cutoffs differentiate the working and non-working populations. All counts exclude the focal individual as well as his or her parents, spouse, and children, since separate variables for the presence of these family members in the focal individual's origin household are also included in the model.

Ethnicity is measured as a series of dummy variables. In Chitwan, there are a variety of ethnic groups, each with its distinct cultural traditions and settlement patterns (Axinn and Yabiku 2001). We

distinguish among upper caste Hindu, Hill Tibeto Burmise, Lower caste Hindus, Newar, and Terai Tibeto Burmise. The upper caste Hindu and Newar are the relatively most privileged groups. The Terai Tibeto Burmise are indigenous people, some of whom were former jungle dwellers who adopted a sedentary farming lifestyle in the 1950s. In Nang Rong, ethnicity is distinguished according to language spoken at home. The categories include Thai, which includes both Central Thai, Thailand's official language, and Korat Thai a Northeastern dialect considered a mix between Thai and Lao (the latter being much more prevalent in Nang Rong); Lao, which is the language of the original inhabitants of the region; Khmer, which is the language spoken in neighboring Cambodia. We note that we dropped a small number of cases in each setting that we could not easily group into these ethnic/linguistic categories. Specifically, we dropped 8 cases designated as "other ethnicity" in Chitwan and 6 cases speaking Suaie in Nang Rong. Additional individual-level characteristics include gender and marital status, which we measure, respectively, with dummy variables indicating whether a respondent was male or ever-married.

Analytical Approach

We use a series of multinomial probit models, which are appropriate to model multi-category nominal outcome variables. We estimate two sets of models for both settings. The first uses a similar model specification across settings, so that differences in model specification can be ruled out when comparing results across settings. The second uses a specification that we feel is better suited to the unique context of each setting. Although these results may be less comparable across settings, they provide some insight into which unique factors may be more important in each region.

Our data have a nested structure: individuals are nested within households, nested within communities, nested within countries. Recalling that we estimate separate models for Nang Rong and Chitwan, this obviates the need to correct for clustering at the country level. We correct for the

covariance matrix of errors for non-independence of observations by clustering within communities, and we also use heteroskedastically robust standard errors (White 1980). Following work by Angeles, Guilkey, and Mroz (2005) we only correct for clustering at the highest remaining hierarchical level (i.e., the community level), since these authors empirical analysis suggests that resulting estimates are comparable to those in which the full hierarchical structure is explicitly specified. To determine the magnitude of variable effect, we use coefficients from our models to compute microsimulated predicted probabilities for key variables which are used in the discussion of results.

Results

[Tables 4 & 5 about here]

We begin by discussing the effects of agricultural variables in the models having a similar specification[5]. Overall, results show that agricultural factors have significant effects on migration, but they are not consistent across settings suggesting they are interacting with contextual factors. For Chitwan, land tenure and animal husbandry are important (see Table 4). Specifically, land ownership reduces the likelihood of migrating within the district (relative to not migrating). Predicted probabilities indicate that young people from households owning land 34 percent less likely to migrate within the district. Raising pigs has a negative effect on the likelihood of being a return migrant and on migrating outside of the district. A percent increase in the number of pigs decreases the likelihood of return migration by 24 percent and decreases the likelihood of migrating outside the district by 25 percent.

For Nang Rong, crop portfolio and use of farm inputs are important migration determinants (see Table 5). Growing only rice increases the likelihood of being an ongoing migrant (by about 9 percent) and of migrating outside of the district (by about 8 percent). Growing no crops increases the likelihood

[5] Where applicable, and unless otherwise indicated, we generally limit our discussion to only those effects that are significant in both models within each setting.

of being an ongoing migrant and of migrating within the district. These effects may be due to the greater susceptibility of risk of growing only a single crop (or no crop), compared to growing a greater variety. Using an irrigation pump makes all forms of migration more likely (predicted probabilities range from about 9 to 15 percent, depending on the contrast). Notably, the irrigation pump effect is significant for both the likelihood of being an out-migrant and a return migrant, suggesting that it may be linked to circular migration. Perhaps young people coming from households involved in pump irrigation migrate in order to earn money, and subsequently invest a portion of that money in maintaining and operating this productivity-enhancing input upon returning.

[Tables 6 & 7 about here]

Turning to models that we felt better captured the unique attributes of each setting, we found some new results, although many of our previous results still held. For Chitwan, we divided land holding size into *Bari* and *Khet* land, and detected different effects for holdings up to three-quarters of a hectare and those beyond this level (i.e., we used a piece-wise specification for both *Khet* and *Bari* land) (see Table 6). Results imply a non-linear effect of *Bari* land holdings on certain migration propensities. For *Bari* land holdings up to three-quarters of a hectare, the likelihood of all migration types increased with the size of landholdings. However, it was negative for ongoing migration and migration within the district for holdings above three-quarters of a hectare. Perhaps young people from households having small landholding (i.e., three-quarters of a hectare or less) are more likely to migrate because such holdings are insufficient for sustaining successful farming. Those from households having larger landholdings may have enough land to sustain themselves without migration. *Khet* land had a similar effect up to three-quarters of a hectare, but only for ongoing migration and migration within the district. For Nang Rong, we examined the independent effect of growing different crop types (see Table 7). We found that growing any cash crops decreases the likelihood of being an ongoing migrant (by about 12

percent) and of migrating outside of the district (by 10 percent), which may suggest that cash crops may provide sufficient capital to allow young people to forego migration.

Turning to the effects of control variables, there are some consistent effects across settings for measures of migration experience and education (e.g., compare results of Table 4 to those of Table 5). Compared to having six years of education (roughly a primary school education), having higher education generally increases the likelihood of migration for all patterns, although not all effects are statistically significant in all models. Having migration experience since age 13 also increases the likelihood of all migration patterns, except migration outside the Chitwan district. These results are consistent with past research on migrant- and human capital.

There are also some differences in migration across ethnic groups in both regions. In Chitwan, compared to upper caste Hindus, Hill Tibeto Burmese are more likely to migrate outside of the region, perhaps because they have outside contacts in areas from which they originated. Terai Tibeto Burmese, the indigenous people, are less likely to be ongoing migrants and to migrate outside of the district. It could be that they are more tied to the land of their ancestors or lack contacts outside of the region that could help them migrate. In Nang Rong, Khmer and Lao speakers are more likely to be ongoing migrants and to migrate outside the district, compared to Thai speakers.

Overall, most control variables show dissimilar effects across settings. In Nang Rong, we find no gender differences in any migration pattern. In contrast, gender is a significant predictor of several patterns in Chitwan (see Table 4). In particular, we find that men are more likely to be return migrants, perhaps because, unlike women, men migrating for marriage may return to their natal household. We also find that men are more likely to migrate outside the district, likely due to restrictions on women's

migration abroad (Thieme and Wyss 2005), gender norms about migration, or limited opportunities for women's employment (Kanaiaupuni 2000, Curran, Garip, et al. 2005).

In Chitwan, we further find that the gender effect depends on education[6], as can be seen by the significant interaction effects shown in Table 6. These findings give us a more nuanced picture of the education effect discussed above. In the model, the main effects of male gender, education, and their interactions are in reference to the omitted category - women with six years of education. Results show that men with six years of education (i.e., the main effect of male gender) are more likely to be return migrants and to migrate outside of the district. The main effects of education are interpreted as the effects for women having these levels of education. Results show that women with less than six years of education are more likely to engage in all migration patterns. Women with more than six years are also more likely to engage in all forms of migration. However, for men, the education effects are less pronounced. Only the effects of migrating outside of the district are significant. Men having less than six years of education and men having more than six years of education are both less likely to migrate in such a fashion compared to the reference group.

In terms of household demographics, young people in our Chitwan sample are more likely to be ongoing migrants as the number of older-age (56 and older) increases. In Nang Rong, ongoing migrations and migration within the district are more likely if neither parent is in the household, perhaps suggesting that those who moved out of their parents' household by baseline may be migrating nearby. Having additional young people in the household (age 14 or younger) makes all forms of migration, except return, more likely. Probably, younger siblings obligate migrants to help the household financially through labor-related migration.

[6] We tested for gender interactions in the Nang Rong data and do not find any evidence for them.

In Chitwan, young people from households in the top wealth tercile are more likely to be return migrants and to migrate outside of the district compared to those from households in the middle tercile. It may be that long distance migration is easier to finance for these wealthier households, and migrants from these households may be more willing to return to them because of their wealth. Results for neighborhood level variables show that all migration patterns are more likely as the distance from the district town increases, suggesting that those living in more remote rural areas have a higher incentive to move. For Nang Rong, contrary to expectations, some migration (i.e., ongoing and outside the district) is more likely as the amount of forest land near the village increases. Perhaps more heavily forested areas are protected from further cultivation, which makes agricultural extensification into such land impossible, which encourages migration.

Conclusions

In this paper we examine agricultural push factors determining migration in two post-frontier rural settings, Nang Rong Thailand, and Chitwan Valley, Nepal. Furthering existing literature, we examine the effects of a wide variety of agricultural determinants beyond just land holding size. These include the effects of land tenure, crop portfolios, animal husbandry, and use of farm inputs. We find that agricultural factors have significant and non-trivial effects on migration patterns in both settings, albeit different factors tend to be predominant in different settings.

In Nang Rong, where only a single annual crop is grown, crop portfolio matters. Specifically, households growing only rice, or no crops, are more likely to have migrating young people, especially outside the district, where non-agricultural jobs are easier to find. This finding is likely due to risk factors associated with a lack of diversity in cropping related to such things as variability in rainfall, crop diseases, and the like. We also find that growing particular crops matters, especially cash crops, which

make migration outside of the district less likely. In a context where an international market for cassava exporting has emerged, young people from households growing cash crops may have enough access to capital from the sale of these crops to forego the risk of migrating to an unfamiliar area to earn money. Finally, in a context in which most irrigation is rain-fed, and the dominant stable crop heavily depends on water, pump irrigation increases the propensity of all forms of migration. Migration is a way of earning money to help pay for the purchase, maintenance and operating costs, which, in turn, likely increase farm productivity and contribute to successful farming. Farming can be balanced with a variety of migration strategies, including circular migration, or relatively more permanent movement.

In Chitwan, agricultural factors linked to migration seem to be associated with land holding size and tenure. In particular, in a context where land holdings tend to be relatively small to begin with, young people coming from households with the smallest landholdings (i.e., three-quarters of a hectare or less) tend to be more likely to migrate (especially short distances) as the size of *Khet* and *Bari* holdings increase. Furthermore, although most households own at least some land, secure tenure (i.e., ownership) lowers the likelihood of migration (particularly within the district). Perhaps insecurity in tenancy and insufficient land holdings makes local wage labor on other household's farms more appealing compared to migration. As land holding size increase, however, migration may be more attractive, and perhaps can be balanced with farming as a way of sustaining the household's livelihood. Young people from households with the largest holdings may have no incentive to migrate as they can work on the family farm. Given that three crops are grown annually, it is unsurprising that factors such as diversity in crop portfolio tend to have little effect. However, animal husbandry, especially raising pigs, is a significant deterrent to some forms of migration (especially outside the district), which perhaps indicates that raising animals for sale and consumption is a workable option for maintaining a livelihood in an area where land holdings are already small.

While our research focuses mainly on agricultural push factors, our results can also inform broader research on migration from a cross-national perspective. Our results indicate that a few factors, such as those related to agriculture and migrant-capital, seem to have a common effect across these two settings. Surprisingly, our findings imply that many non-agricultural factors that are commonly thought to influence migration, such as education or gender, have different effects in different regions. Our results are therefore in agreement with existing cross-cultural studies (Goldstein 1987, Roberts 1997, Sana and Massey 2005, VanWey 2005) that suggest migration determinants must be understood in the specific context in which they are embedded, although there likely are some universal factors operating in every setting. Future research should pay more attention to the link between individual migration behavior and the broader institutional structure in which migration is occurring. This will be no easy task, as it requires comparable cross-national longitudinal data on individuals and their social contexts.

We acknowledge that our research has some limitations that may threaten our results. First, our data come from two studies that were not designed for comparative analysis, so some findings may be due to differences in survey design or operationalization rather than to true differences across settings. We have taken steps to create comparable measures and have employed a similar analytical strategy to both data sets to minimize this potential limitation. Second, our sample may be truncated due to early migration occurring before baseline, which may introduce selectivity bias. For Nang Rong, we have an earlier data panel we can use to examine the characteristics of members of our sample cohort (age 15-19 in 1994) ten years prior to baseline, when they were between the ages of 5 and 9. Using 1984 data, we compare characteristics of those who eventually get into our analytical sample and those who do not (*results available upon request*). We note that individuals could have moved into the region any time between 1984 and 1994, so not all members of the 1994 sample necessarily link to a 1984 record. We

also note that the 1984 survey did not contain the same breadth of information about agricultural factors as is found in later surveys, so comparisons are limited.

We identified 4,117 individuals in 1984 that were in the proper age range. Just under half of them made it into our 1994 sample. Comparing average measures of the size of household land holdings and animal husbandry activities, we find statistically significant differences between cases included in the 1994 sample and those excluded from it. However, judging the difference in terms of magnitude, all of them seem small. In particular, the average difference in land holding size is only about 0.15 hectares, and only cattle show an average difference of more than one animal. We therefore believe that while we may overstate the effect of some agricultural factors, we do not do so by much. Furthermore, the statistically significant difference we find is probably due to the large sample size, and therefore high statistical power, which can detect even small differences across groups.

Third, our measure of migration duration does not make a clean distinction between circular migrants and 'permanent' migrants. Instead, we rely on a comparison of returning migrants, who have completed a circular migration episode, and ongoing migrants, who may have returned at some point without our knowledge. The Chitwan data allow us to examine the more ideal comparison between non-migrants, circular migrants, and 'permanent' migrants. We use results from a model that incorporates this distinction as the dependent variable as a check on the robustness of results from our final model. In Chitwan, a little over half of the migrants we defined as 'ongoing' are found to have engaged in a circular migration pattern at some point in the time period under investigation. Comparing results of our final model (see Table 6) to result of our new model (see Table 1A) shows that many findings are robust to the specification of the dependent variable. This suggests that our original analysis is capturing some substantive feature of circular migration. There are a few noteworthy differences, however. Specifically,

the effects of amounts of *Khet* and *Bari* land exceeding three-quarters of a hectare, and the effect of cattle, are different, but these results do not change our basic conclusions.

Despite its limitations, our paper makes a valuable contribution to the literature on migration push factors, an understudied area of migration research, and to the literature on migration from a cross-national perspective. Our findings imply that studies of rural out-migration should take into account factors related to many aspects of agriculture, particularly in settings were agriculture is the main economic activity. Findings also suggest that contextual variation plays an important role in differentiating migration patterns that are often assumed to be similar across time and space.

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Table 1. Hypothesized Effects of Farm System Variables on Migration

Migration Type	Duration		Distance	
Farm System Variables	Short	Long	Short	Long
secure land tenure	-/+	-	-/+	-
diversified crop portfolio	-	-	-	-
engage in animal husbandry	-	-	-	-
use of agricultural inputs	-/+	-/+	-/+	-/+
mechanization	+	+	+	+

Note: '+' and '-' indicate positive and negative effects, respectively on type of migration (relative to non-migration)

Table 2. Percentage Distribution of Migration Status and Distance for Nang Rong, Thailand in 1994 and Chitwan, Nepal in 1996

Status	Chitwan	Nang Rong	**Distance**	Chitwan	Nang Rong
Did Not Migrate	39	27	Did Not Migrate	39	27
Return Migrant	14	19	Migrated Only within District	28	6
Ongoing Migrant	46	54	Migrated Outside of District	33	67
Total[a]	100	100	Total	100	100
N	876	2538	N	876	2538

Table 3. Descriptive Statistics for Individuals Age 15-19 in Nang Rong in 1994, Thailand and Chitwan Valley, Nepal in 1996

	Chitwan		Nang Rong	
Variable	Mean	Std Dev	Mean	Std Dev
Size of Household Land Holdings (HA)	1.01	0.94	3.57	3.63
Bari land Holdings (HA)	0.30	0.42	--	--
Khet land Holdings (HA)	0.71	0.79	--	--
Household Land Holding Status				
Owns any land	0.93	0.26	0.93	0.25
Sharecrops any land	0.25	0.43	0.18	0.38
Mortgages any land	0.12	0.32	0.04	0.20
Crop Portfolio				
Grows rice only	0.33	0.47	0.70	0.46
Grows cash crops only	0.04	0.20	0.01	0.10
Grows no crops	0.11	0.32	0.08	0.26
Grows combination of crops	0.51	0.50	0.21	0.41
Crops Grown				
Grows rice	0.65	0.48	0.91	0.28
Grows cash crops	0.31	0.46	0.17	0.38
Grows other crops	0.42	0.49	0.05	0.23
Animal Husbandry				
Number of cattle	1.34	1.70	1.62	4.60
Number of buffalo	1.79	1.68	2.26	2.77
Number of pigs	0.08	0.43	0.66	3.10
Farm Mechanization				
Household uses irrigation pump	0.12	0.32	0.17	0.38
Household uses tractor	0.70	0.46	0.60	0.49
Demographic Characteristics of Individual				
Gender (male)	0.44	0.50	0.52	0.50
Age (in years)	16.86	1.37	16.79	1.41
Marital status (ever-married)	0.14	0.35	0.07	0.26
Any Own children in Household	0.05	0.22	0.03	0.18
Educational Attainment				
Less than six years of education	0.30	0.46	0.06	0.24
Six years of education	0.12	0.33	0.59	0.49
Over six years of education	0.58	0.49	0.35	0.48
Ethnicity				
Upper caste Hindu	0.52	0.50	--	--
Hill Tibeto Burmise	0.14	0.34	--	--
Lower caste Hindu	0.10	0.30	--	--
Newar	0.07	0.25	--	--
Terai Tibeto Burmise	0.18	0.38	--	--
Migrations since age 13 (count, logged)	0.24	0.49	--	--
Other Household Characteristics				
Language Spoken in the Household				
Thai (Korat and Central)	--	--	0.77	0.42
Khmer	--	--	0.07	0.26
Lao	--	--	0.16	0.37
Parent's Residence with Household				
Both parents reside	0.75	0.43	0.78	0.42
Only one parent resides	0.09	0.29	0.14	0.34
Neither parent resides	0.16	0.37	0.09	0.28
Other members age 14 or younger (count)	1.95	1.90	1.07	1.06
Other members age 15-55 (count)	1.86	1.86	1.17	1.19
Other members age 56 or older (count)	0.22	0.52	0.23	0.51
Members with migration experience (count)	0.80	1.04	0.40	0.68
Household wealth distribution position				
Bottom Tercile	0.25	0.43	0.18	0.39
Middle Tercile	0.37	0.48	0.38	0.49
Top Tercile	0.38	0.49	0.44	0.50
Neighborhood/Village Variables				
Undeveloped or common land in neighborhood (%)	1.17	5.26	--	--
Forest land in 3km buffer (%)	--	--	16.00	5.05
Time since obtaining electicity (years)	4.01	6.21	9.03	4.43
Distance of district town (Km)	13.78	6.59	12.90	5.18
N	876		2538	

Table 4. Multinomial Probit Estimates for Migration Status and Distance for Individuals Age 15-19 in Chitwan Valley, Nepal in 1996

	Migration Status[b]				**Migration Distance[b]**			
	Return Migrant		Ongoing Migrant		Within District		Outside District	
Variable	Coeff	Std Err[a]	Coeff	Std Err[a]	Coeff	Std Err[a]	Coeff	Std Err[a]
Intercept	-6.66***	1.31	-4.14***	1.10	-2.89*	1.18	-6.63***	1.13
Household Land Holdings Size (HA, logged)	-0.062	0.33	0.22	0.26	0.25	0.29	0.058	0.27
Household Land Holding Status								
Owns any land	0.00027	0.47	-0.76	0.39	-1.06**	0.37	-0.16	0.46
Sharecrops any land	-0.13	0.19	-0.12	0.18	-0.12	0.20	-0.13	0.18
Mortgages any land	-0.033	0.27	0.27	0.20	0.21	0.24	0.14	0.21
Crop Portfolio								
Grows only cash crops	-0.89	0.52	-0.17	0.46	-0.23	0.49	-0.44	0.42
Grows only rice	-0.038	0.18	-0.045	0.17	0.060	0.17	-0.17	0.18
Does not grow crops	-0.18	0.48	0.51	0.37	0.40	0.37	0.22	0.38
Grows combination of crops	--	--	--	--	--	--	--	--
Animal Husbandry								
Number of cattle (logged)	-0.098	0.16	-0.080	0.13	-0.11	0.15	-0.060	0.12
Number of buffalo (logged)	-0.029	0.17	-0.17	0.17	-0.054	0.18	-0.21	0.15
Number of pigs (logged)	-1.53*	0.62	-0.39	0.31	-0.28	0.35	-0.93**	0.32
Farm Mechanization								
Household uses irrigation pump	-0.19	0.27	0.071	0.18	-0.19	0.23	0.17	0.21
Household uses tractor	0.17	0.23	0.070	0.22	0.016	0.24	0.16	0.22
Demographic Characteristics of Individual								
Gender (male)	0.73***	0.19	0.18	0.15	-0.10	0.15	0.72***	0.17
Age (in years)	0.25***	0.066	0.21***	0.051	0.14*	0.055	0.29***	0.056
Marital status (ever-married)	0.31	0.33	-0.72*	0.34	-0.22	0.37	-0.51	0.30
Any Own children in Household	-1.14**	0.43	-1.05**	0.36	-0.88*	0.37	-1.44***	0.40
Educational Attainment								
Less than six years of education	0.41	0.28	0.64***	0.19	0.44*	0.20	0.73**	0.23
Six years of education	--	--	--	--	--	--	--	--
Over six years of education	0.40	0.25	0.71***	0.19	0.64**	0.20	0.64**	0.21
Ethnicity								
Upper caste Hindu	--	--	--	--	--	--	--	--
Hill Tibeto Burmise	0.060	0.27	0.25	0.22	0.17	0.23	0.23	0.23
Lower caste Hindu	0.41	0.29	0.16	0.25	-0.079	0.31	0.49*	0.23
Newar	-0.54	0.43	-0.24	0.30	-0.39	0.31	-0.16	0.30
Terai Tibeto Burmise	-0.25	0.30	-0.86***	0.26	-0.49	0.27	-0.84**	0.26
Migrations since age 13 (count, logged)	0.71*	0.30	0.61*	0.25	0.79**	0.27	0.44	0.28
Other Household Characteristics								
Parents' Residence in Household								
Both parents reside	--	--	--	--	--	--	--	--
Only one parent resides	-0.22	0.31	0.25	0.25	0.39	0.27	-0.16	0.24
Neither parent resides	0.084	0.35	0.46	0.34	0.24	0.37	0.40	0.30
Other members age 14 or younger (count, logged)	-0.12	0.14	-0.090	0.10	-0.099	0.12	-0.11	0.11
Other members age 15-55 (count, logged)	-0.15	0.17	-0.23	0.15	-0.20	0.17	-0.20	0.14
Other members age 56 or older (count, logged)	-0.28	0.28	-0.44*	0.21	-0.39	0.25	-0.41	0.22
Members with migration experience (count, logged)	0.19	0.21	0.37*	0.18	0.26	0.21	0.36*	0.17
Household wealth distribution position								
Bottom Tercile	0.086	0.23	0.086	0.19	0.0034	0.20	0.16	0.21
Middle Tercile	--	--	--	--	--	--	--	--
Top Tercile	0.45*	0.21	0.25	0.17	0.19	0.18	0.42*	0.18
Neighborhood/Village Variables								
Undeveloped or common land in neighborhood (%, logged)	0.23	0.16	0.22	0.12	0.23	0.13	0.15	0.12
Time since obtaining electicity (years, logged)	-0.100	0.090	-0.097	0.082	-0.12	0.093	-0.088	0.085
Distance of district town (Km, logged)	0.44**	0.17	0.41*	0.17	0.39*	0.19	0.40*	0.16
-2LL	1555.80				1691.40			
N	876				876			

Notes: [a] Robust standard errors corrected for neighborhood-level clustering

[b] Reference Category is 'Did not Migrate'

* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)

Table 5. Multinomial Probit Estimates for Migration Status and Distance for Individuals Age 15-19 in Nang Rong, Thailand in 1994

	Migration Status[b]				**Migration Distance[b]**			
	Return Migrant		Ongoing Migrant		Within District		Outside District	
Variable	Coeff	Std Err[a]	Coeff	Std Err[a]	Coeff	Std Err[a]	Coeff	Std Err[a]
Intercept	-0.55	0.98	-0.71	0.83	-1.96	1.19	-0.28	0.83
Household Land Holdings Size (HA, logged)	0.015	0.081	-0.095	0.063	-0.095	0.086	-0.053	0.062
Household Land Holding Status								
Owns any land	-0.14	0.17	0.026	0.18	-0.22	0.22	0.027	0.18
Rents any land	-0.080	0.12	-0.086	0.11	-0.017	0.15	-0.097	0.11
Mortgages any land	-0.15	0.21	-0.10	0.23	0.17	0.26	-0.17	0.23
Crop Portfolio								
Grows only cash crops	0.43	0.36	-0.099	0.51	0.059	0.66	0.11	0.42
Grows only rice	0.18	0.11	0.30***	0.081	0.18	0.15	0.29***	0.084
Does not grow crops	0.12	0.23	0.44*	0.19	0.53*	0.27	0.35	0.19
Grows combination of crops	--	--	--	--	--	--	--	--
Animal Husbandry								
Number of cattle (logged)	0.039	0.050	-0.050	0.052	0.0029	0.077	-0.028	0.049
Number of buffalo (logged)	-0.010	0.060	-0.0089	0.052	-0.026	0.080	-0.0088	0.054
Number of pigs (logged)	-0.063	0.084	-0.068	0.072	0.060	0.12	-0.087	0.062
Farm Mechanization								
Household uses irrigation pump	0.40**	0.14	0.35**	0.11	0.39*	0.17	0.38**	0.12
Household uses tractor	-0.058	0.11	-0.18	0.098	-0.14	0.14	-0.14	0.10
Demographic Characteristics of Individual								
Gender (male)	0.047	0.084	0.022	0.085	0.13	0.098	0.013	0.079
Age (in years)	0.016	0.034	-0.035	0.033	0.077	0.051	-0.036	0.033
Marital status (ever-married)	-0.95***	0.27	-0.50*	0.23	-0.39	0.28	-0.69**	0.24
Any Own children in Household	0.17	0.33	0.033	0.28	0.084	0.40	0.034	0.27
Educational Attainment								
Less than six years of education	-0.44*	0.18	-0.35*	0.15	-0.013	0.20	-0.47**	0.15
Six years of education	--	--	--	--	--	--	--	--
Over six years of education	0.23*	0.11	0.85***	0.092	0.31*	0.15	0.74***	0.094
Migrations since age 13 (count, logged)	0.56***	0.16	0.27*	0.11	0.41*	0.21	0.39**	0.13
Other Household Characteristics								
Language Spoken in the Household								
Thai (Korat and Central)	--	--	--	--	--	--	--	--
Khmer	0.28	0.17	0.35*	0.17	0.14	0.30	0.37*	0.15
Lao	0.16	0.22	0.41***	0.12	-0.31	0.22	0.44**	0.14
Parent's Residence with Household								
Both parents reside	--	--	--	--	--	--	--	--
Only one parent resides	-0.044	0.14	0.065	0.12	0.15	0.20	0.015	0.12
Neither parent resides	0.065	0.20	0.38*	0.16	0.61**	0.20	0.24	0.16
Other members age 14 or younger (count, logged)	0.10	0.088	0.30**	0.091	0.36*	0.14	0.23*	0.088
Other members age 15-55 (count, logged)	-0.076	0.10	0.092	0.093	0.24	0.13	0.014	0.092
Other members age 56 or older (count, logged)	0.036	0.18	0.075	0.15	0.10	0.19	0.053	0.15
Members with migration experience (count, logged)	0.10	0.16	0.016	0.12	0.12	0.15	0.029	0.12
Household wealth distribution position								
Bottom Tercile	-0.19	0.14	-0.030	0.10	-0.17	0.17	-0.070	0.11
Middle Tercile	--	--	--	--	--	--	--	--
Top Tercile	-0.13	0.12	-0.080	0.12	-0.095	0.16	-0.10	0.12
Neighborhood/Village Variables								
Forest land in 3km buffer (%, logged)	0.12	0.20	0.49**	0.18	-0.050	0.27	0.46**	0.16
Time since obtaining electicity (years, logged)	-0.13	0.11	-0.12	0.096	-0.036	0.14	-0.15	0.097
Distance of district town (Km, logged)	-0.047	0.13	0.064	0.11	-0.22	0.12	0.081	0.14
-2LL	4801.00				3766.40			
N	2538				2538			

Notes: [a] Robust standard errors corrected for village-level clustering

[b] Reference Category is 'Did not Migrate'

* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)

Table 6. Multinomial Probit Estimates for Migration Status and Distance for Individuals Age 15-19 in Chitwan Valley, Nepal in 1996

	Migration Status[b]				**Migration Distance[b]**			
	Return Migrant		Ongoing Migrant		Within District		Outside District	
Variable	Coeff	Std Err[a]	Coeff	Std Err[a]	Coeff	Std Err[a]	Coeff	Std Err[a]
Intercept	-7.49***	1.30	-4.74***	1.12	-3.46**	1.18	-7.61***	1.17
Household Land Holdings Size								
Bariland - up to 3/4 HA	0.94*	0.41	0.92*	0.37	1.11**	0.42	0.74*	0.37
Bariland - over 3/4 HA	-0.61	0.47	-0.94*	0.41	-0.92*	0.46	-0.78	0.42
Khetland - up to 3/4 HA	0.22	0.34	0.76*	0.31	0.92**	0.33	0.40	0.32
Khetland - over 3/4 HA	-0.097	0.19	-0.083	0.12	-0.15	0.17	-0.034	0.12
Household Land Holding Status								
Owns any land	0.00045	0.47	-0.79*	0.40	-1.11**	0.38	-0.17	0.47
Sharecrops any land	-0.15	0.19	-0.16	0.17	-0.15	0.20	-0.16	0.17
Mortgages any land	-0.13	0.27	0.24	0.22	0.15	0.25	0.089	0.21
Crop Portfolio								
Grows only cash crops	-0.93	0.56	-0.10	0.50	-0.17	0.53	-0.40	0.44
Grows only rice	0.098	0.20	0.034	0.18	0.18	0.19	-0.094	0.18
Does not grow crops	0.078	0.49	0.79*	0.37	0.74	0.38	0.46	0.39
Grows combination of crops	--	--	--	--	--	--	--	--
Animal Husbandry								
Number of cattle (logged)	-0.13	0.15	-0.13	0.13	-0.17	0.15	-0.098	0.12
Number of buffalo (logged)	-0.087	0.17	-0.22	0.17	-0.11	0.18	-0.26	0.15
Number of pigs (logged)	-1.58*	0.66	-0.42	0.33	-0.30	0.37	-0.97**	0.34
Farm Mechanization								
Household uses irrigation pump	-0.27	0.27	0.064	0.19	-0.22	0.23	0.13	0.22
Household uses tractor	0.12	0.23	0.047	0.22	-0.017	0.24	0.13	0.22
Demographic Characteristics of Individual								
Gender (male)	1.51**	0.47	0.42	0.40	-0.21	0.42	1.72***	0.47
Age (in years)	0.26***	0.067	0.22***	0.052	0.15**	0.056	0.31***	0.056
Marital status (ever-married)	0.31	0.33	-0.78*	0.34	-0.23	0.36	-0.55	0.30
Any Own children in Household	-1.13**	0.44	-1.05**	0.37	-0.87*	0.37	-1.47***	0.41
Educational Attainment								
Less than six years of education	0.82*	0.41	0.92***	0.24	0.62*	0.25	1.38***	0.34
Six years of education	--	--	--	--	--	--	--	--
Over six years of education	0.91*	0.38	0.76**	0.24	0.57*	0.26	1.27***	0.34
Ethnicity								
Upper caste Hindu	--	--	--	--	--	--	--	--
Hill Tibeto Burmise	0.024	0.26	0.25	0.23	0.17	0.25	0.22	0.23
Lower caste Hindu	0.35	0.29	0.20	0.25	-0.016	0.31	0.50*	0.24
Newar	-0.56	0.43	-0.25	0.30	-0.40	0.31	-0.21	0.31
Terai Tibeto Burmise	-0.35	0.30	-0.92***	0.26	-0.55	0.28	-0.92***	0.27
Migrations since age 13 (count, logged)	0.78**	0.30	0.70**	0.25	0.92***	0.26	0.51	0.28
Other Household Characteristics								
Parents' Residence in Household								
Both parents reside	--	--	--	--	--	--	--	--
Only one parent resides	-0.25	0.31	0.19	0.25	0.32	0.27	-0.19	0.24
Neither parent resides	0.11	0.34	0.48	0.34	0.21	0.37	0.45	0.31
Other members age 14 or younger (count, logged)	-0.11	0.15	-0.064	0.11	-0.057	0.12	-0.098	0.12
Other members age 15-55 (count, logged)	-0.18	0.17	-0.24	0.16	-0.21	0.18	-0.23	0.15
Other members age 56 or older (count, logged)	-0.30	0.28	-0.51*	0.21	-0.48	0.25	-0.45*	0.22
Members with migration experience (count, logged)	0.19	0.21	0.35	0.19	0.24	0.21	0.34*	0.17
Household wealth distribution position								
Bottom Tercile	0.15	0.23	0.13	0.20	0.048	0.20	0.19	0.22
Middle Tercile	--	--	--	--	--	--	--	--
Top Tercile	0.44*	0.21	0.28	0.17	0.23	0.18	0.44*	0.18
Neighborhood/Village Variables								
Undeveloped or common land in neighborhood (%, logged)	0.26	0.17	0.24*	0.12	0.26	0.14	0.17	0.12
Time since obtaining electicity (years, logged)	-0.12	0.090	-0.13	0.082	-0.16	0.094	-0.11	0.086
Distance of district town (Km, logged)	0.45**	0.17	0.39*	0.16	0.36	0.18	0.40*	0.16
Interaction Terms								
Male × Less than six years of education	-0.72	0.53	-0.63	0.42	-0.33	0.47	-1.16*	0.46
Male × Over six years of education	-0.94	0.50	-0.11	0.46	0.30	0.47	-1.08*	0.52
-2LL	1534.20				1665.80			
N	876				876			

Notes: [a] Robust standard errors corrected for neighborhood-level clustering

[b] Reference Category is 'Did not Migrate'

* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)

Table 7. Multinomial Probit Estimates for Migration Status and Distance for Individuals Age 15-19 in Nang Rong, Thailand in 1994

	Migration Status[b]				**Migration Distance[b]**			
	Return Migrant		Ongoing Migrant		Within District		Outside District	
Variable								
Intercept	-0.39	0.99	-0.38	0.84	-1.39	1.24	-0.023	0.84
Household Land Holdings Size (HA, logged)	0.026	0.079	-0.092	0.063	-0.089	0.088	-0.049	0.061
Household Land Holding Status								
Owns any land	-0.14	0.17	0.013	0.18	-0.23	0.22	0.018	0.18
Rents any land	-0.064	0.12	-0.090	0.11	-0.017	0.15	-0.096	0.11
Mortgages any land	-0.15	0.21	-0.099	0.23	0.18	0.26	-0.17	0.23
Crops Grown								
Grows rice	-0.045	0.20	-0.092	0.18	-0.36	0.22	-0.042	0.17
Grows cash crops	-0.16	0.11	-0.37***	0.098	-0.20	0.17	-0.33***	0.097
Grows other crops	-0.083	0.19	-0.16	0.16	-0.25	0.22	-0.12	0.15
Animal Husbandry								
Number of cattle (logged)	0.036	0.049	-0.049	0.052	0.0039	0.077	-0.029	0.049
Number of buffalo (logged)	-0.0049	0.061	-0.0088	0.053	-0.020	0.080	-0.0081	0.055
Number of pigs (logged)	-0.064	0.084	-0.068	0.072	0.059	0.12	-0.087	0.062
Farm Mechanization								
Household uses irrigation pump	0.40**	0.14	0.35**	0.12	0.39*	0.17	0.38**	0.12
Household uses tractor	-0.044	0.11	-0.18	0.095	-0.13	0.14	-0.14	0.099
Demographic Characteristics of Individual								
Gender (male)	0.046	0.084	0.022	0.084	0.13	0.098	0.013	0.079
Age (in years)	0.017	0.034	-0.036	0.033	0.076	0.051	-0.037	0.033
Marital status (ever-married)	-0.95***	0.27	-0.49*	0.23	-0.39	0.28	-0.68**	0.24
Any Own children in Household	0.17	0.33	0.020	0.28	0.082	0.40	0.023	0.26
Educational Attainment								
Less than six years of education	-0.44*	0.18	-0.35*	0.15	-0.013	0.20	-0.47**	0.16
Six years of education	--	--	--	--	--	--	--	--
Over six years of education	0.23*	0.11	0.85***	0.093	0.30*	0.15	0.74***	0.095
Migrations since age 13 (count, logged)	0.56***	0.16	0.27*	0.11	0.41*	0.21	0.39**	0.13
Other Household Characteristics								
Language Spoken in the Household								
Thai (Korat and Central)	--	--	--	--	--	--	--	--
Khmer	0.29	0.17	0.34*	0.16	0.14	0.30	0.36*	0.15
Lao	0.16	0.22	0.40**	0.12	-0.31	0.23	0.42**	0.14
Parent's Residence with Household								
Both parents reside	--	--	--	--	--	--	--	--
Only one parent resides	-0.043	0.14	0.066	0.12	0.15	0.20	0.016	0.12
Neither parent resides	0.070	0.20	0.38*	0.16	0.61**	0.20	0.25	0.16
Other members age 14 or younger (count, logged)	0.099	0.088	0.29**	0.090	0.36*	0.14	0.22*	0.087
Other members age 15-55 (count, logged)	-0.083	0.11	0.094	0.093	0.24	0.13	0.014	0.091
Other members age 56 or older (count, logged)	0.025	0.17	0.070	0.15	0.11	0.19	0.045	0.15
Members with migration experience (count, logged)	0.10	0.16	0.015	0.12	0.12	0.15	0.027	0.12
Household wealth distribution position								
Bottom tercile	-0.19	0.15	-0.037	0.10	-0.18	0.17	-0.073	0.11
Middle tercile	--	--	--	--	--	--	--	--
Top tercile	-0.13	0.12	-0.080	0.11	-0.095	0.16	-0.10	0.12
Neighborhood/Village Variables								
Forest land in 3km buffer (%, logged)	0.12	0.20	0.50**	0.18	-0.058	0.27	0.47**	0.16
Time since obtaining electicity (years, logged)	-0.13	0.12	-0.12	0.096	-0.034	0.14	-0.14	0.097
Distance of district town (Km, logged)	-0.037	0.13	0.088	0.11	-0.22	0.13	0.11	0.14
-2LL	4802.20				3764.80			
N	2538				2538			

Notes: [a] Robust standard errors corrected for village-level clustering

[b] Reference Category is 'Did not Migrate'

* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)

Table 1A. Multinomial Probit Estimates for Migration Status (Circular Migration vs 'Permanent' Migration) in Chitwan Valley, Nepal in 1996

	Migration Status[b]			
	Circular Migrant		Permanent' Migrant	
Variable	Coeff	Std Err[a]	Coeff	Std Err[a]
Intercept	-7.04***	1.09	-3.14**	1.22
Household Land Holdings Size				
Bariland - up to 3/4 HA	0.92*	0.37	0.93*	0.43
Bariland - over 3/4 HA	-0.91*	0.37	-0.78	0.50
Khetland - up to 3/4 HA	0.48	0.30	0.87*	0.36
Khetland - over 3/4 HA	0.00092	0.13	-0.33*	0.16
Household Land Holding Status				
Owns any land	-0.39	0.41	-0.87*	0.38
Sharecrops any land	-0.18	0.16	-0.082	0.19
Mortgages any land	0.012	0.21	0.29	0.25
Crop Portfolio				
Grows only cash crops	-0.67	0.42	0.21	0.57
Grows only rice	-0.013	0.17	0.12	0.19
Does not grow crops	0.30	0.39	0.87*	0.37
Grows combination of crops	--	--	--	--
Animal Husbandry				
Number of cattle (logged)	-0.046	0.13	-0.27*	0.14
Number of buffalo (logged)	-0.21	0.16	-0.12	0.17
Number of pigs (logged)	-1.01**	0.35	-0.11	0.35
Farm Mechanization				
Household uses irrigation pump	-0.036	0.21	0.051	0.25
Household uses tractor	0.15	0.21	-0.094	0.23
Demographic Characteristics of Individual				
Gender (male)	1.04*	0.44	0.39	0.44
Age (in years)	0.30***	0.050	0.13*	0.060
Marital status (ever-married)	-0.083	0.33	-1.10**	0.39
Any Own children in Household	-1.24***	0.37	-0.81*	0.40
Educational Attainment				
Less than six years of education	0.98**	0.30	0.74**	0.26
Six years of education	--	--	--	--
Over six years of education	0.99***	0.30	0.51	0.27
Ethnicity				
Upper caste Hindu	--	--	--	--
Hill Tibeto Burmise	0.11	0.23	0.33	0.26
Lower caste Hindu	0.11	0.24	0.44	0.28
Newar	-0.43	0.31	-0.079	0.31
Terai Tibeto Burmise	-0.98***	0.25	-0.43	0.28
Migrations since age 13 (count, logged)	0.86**	0.28	0.45	0.27
Other Household Characteristics				
Parents' Residence in Household				
Both parents reside	--	--	--	--
Only one parent resides	-0.15	0.26	0.39	0.28
Neither parent resides	0.15	0.34	0.79*	0.36
Other members age 14 or younger (count, logged)	-0.081	0.11	-0.096	0.12
Other members age 15-55 (count, logged)	-0.19	0.15	-0.30	0.18
Other members age 56 or older (count, logged)	-0.33	0.22	-0.78**	0.25
Members with migration experience (count, logged)	0.32	0.18	0.25	0.21
Household wealth distribution position				
Bottom Tercile	0.25	0.21	-0.023	0.20
Middle Tercile	--	--	--	--
Top Tercile	0.40*	0.17	0.24	0.19
Neighborhood/Village Variables				
Undeveloped or common land in neighborhood (%, logged)	0.29*	0.14	0.14	0.14
Time since obtaining electicity (years, logged)	-0.15	0.086	-0.099	0.088
Distance of district town (Km)	0.46**	0.16	0.27	0.18
Interaction Terms				
Male × Less than six years of education	-0.71	0.46	-0.62	0.46
Male × Over six years of education	-0.52	0.48	-0.26	0.50
-2LL	1611.00			
N	876			

Notes: [a] Robust standard errors corrected for neighborhood-level clustering

[b] Reference Category is 'Did not Migrate'

* p < .05 ** p < .01 *** p < .001 (Two-Tailed Test)