JOURNAL OF POPULATION AND SOCIAL STUDIES Volume 16 Number 1 July 2007

Labor Migration in Kanchanaburi Demographic Surveillance System: Characteristics and Determinants

Tran Quang Lam
John R. Bryant
Aphichat Chamratrithirong
Yothin Sawangdee

Introduction

Internal labor migration is an important phenomenon in developing countries around the world. One of the most significant characteristics of internal migration in recent years is the increase of temporary migration (Deshingkar and Grimm, 2005). Temporary migration in particular is of great concern in many developing countries since its size is expanding. Evidence from various countries reveals positive impact of internal labor migration on countries' development in general and family welfare in particular (Afsar, 2003; Ping and Pieke, 2003; Dang, Tacoli and Hoang, 2003). However, migration process is still viewed negatively concerning economical, social and political aspects by governments and policy-makers. As a consequence, migration policy has not been paid enough attention and in many cases misleading i.e. restriction of movement and employment of migrants (Deshingkar and Grimm, 2005). Thailand is also not an exception and also an interesting context for migration research.

Taking advantage of rich information of longitudinal data on labor migration in Kanchanaburi Demographic Surveillance System (KDSS), Thailand, this study aims to examine characteristics of labor migration in KDSS. In addition, determinants and major forces of labor migration are also examined since information at place of origin and before migration process are collected. Study findings will contribute to better understanding of the nature, characteristics and socio-economic determinants affecting labor migration and help policy-makers to have right and effective decisions to develop proper policies as well as contribute to the greater effectiveness of existing policies.

Theoretical Consideration and Migration Situation in Thailand

Lee (1966) considers a wide range of factors affecting behavior of migrants. His introduction of push and pull theory in migration has been received a lot of attention and discussion from many researchers. Lee's theory interprets migration as a function of migrants' response to two sets of factors i.e. push-factors at origin and pull-factors at destination. Those factors are both economic and non-economic. Major economic variables are income differentials and employment opportunities. Non-economic factors can be family ties, housing, marriage, language, ethnicity, etc. Hence, potential migrants do not only response to economic opportunities but also take other things into their consideration. However, the push-pull theory can not explain some phenomena such as why migration is selective, why patterns of migration change over time, etc.

Neoclassical economics theorists (Sjaastad, 1962; Todaro, 1969; Da Vanzo, 1981) try to explain the impact of economic variables on propensity of migration. Individuals make decision to migrate based on individuals' calculation between economic benefit and cost. They are more likely to migrate if future returns, both in short- and long-run, exceed the costs of migration. However, neoclassical economics do not include non-economic factors in the migration decisions which, in many cases, pose a considerable impact on migration decision. Impact of non-economic variables is likely related to constraint during migration process while economic factors are more associated with motives for migration. Another weakness is to underestimate the influences of households and contextual conditions, especially when the unit of migration-decision making is household/family instead of individual.

Still paying attention to income differences between origin and destination as an explanation for migration decision-making, other researchers (Massey, 1990; Massey, et al., 1993) also bring in the impact of household and contextual factors. Household is considered as the unit of making decision. Migration or sending away member/s from a crowded household is the household strategy to diversify risks as well as increase income and wealth. Contextual impact may work through migration network which provides support and help to reduce risks to migrants. This prediction is supported by other research (Stark and Bloom, 1985) that "Migration decisions are often made jointly by the migrants and by some groups of non-migrants. Costs and returns are shared". Stillwell and Condon (1991) also suggest that factors being

considered for migration decision should include individual characteristics (age, sex, marital status, etc.) and broader characteristics of areas or labor market.

In Thailand, internal migration has been happening for a long time. With a market-oriented economy and no control of people's movement, people are easy to response to migration opportunities. The Thai population and housing censuses (1970 – 2000) show an increasing pattern of internal migration in absolute number since rapidly economic growth in 1970s. In early 1970s, the number of persons who had moved to other places during the previous five years was more than 2 million. Thirty years later, this number went up to almost 4 million in 2000 though migration rate was slowed down as consequence of the economic crisis in late 1990s in Asia.

According to the 1990 Thailand Population Census, migrants in Thailand concentrated in young adult ages and males dominated migration flows. Strong positive relationship between education and migration was also found (Chamratrithirong, et al., 1995). Findings from a study by Guest (1998) using data from the 1995 National Migration Survey of Thailand (NMS) and including temporary migration in the analysis showed that about one-third of total internal migrants were temporary, both seasonal and circular. The main flow of temporary migrants was from the northeast towards Bangkok, as the primate city, and its surrounding areas. The temporary inflow occurred during the dry-season and the outflow was in the wet season. Characteristics of temporary migrants were male-dominated, older, more married and less educated than those of more permanent migrants (Guest, 1998). Economic reasons play an important role in migration process. Seasonal migrants from agricultural sector moved to Bangkok in dry season to work in transportation and production sectors. About 40 percent of labors working in construction, small factories and daily laborers were temporary migrants (Guest, 1998).

Discussion from another study using the 1995 NMS data (De Jong, 2000) suggested that lower income in local community and less satisfaction with work opportunities in rural community were significant determinants for migration intention. However, migration intention was not significant predictor for temporary migration behavior. This could be explained that temporary migration decision was more likely to respond to urgent needs of the families than planning as in more permanent move. In addition, other factors such as education, household income level, land ownership and community context variables, which were significant in migration literature in other countries, were not significant in this study. It was contrasted to findings by Richter, et

al.(1997) that low income was a determinant for temporary migration as a household survival strategy in rural Thailand.

Research on labor migration in Thailand (Soonthorndhada, 1987; Porpora and Lim, 1987; Tangchonlatip, et al., 2006) revealed that in general there were more female migrants to Bangkok and five peripheral provinces. Female labors moved to Bangkok due to higher opportunities of employment and social affinities. Majority of female migrants were single and in younger age groups of 15-24. Poverty in rural areas and higher wage in Bangkok were the main reasons for massive in-migration.

Data Source, Measurement and Methodology

This study uses data from the second (2001) and third (2002) rounds of Kanchanaburi Demographic Surveillance System (KDSS). The Kanchanaburi project is a demographic surveillance to monitor changes in demographic, socio-economic and health status characteristics of the population in the field site. The project is conducted in selected areas of Kanchanaburi province, Thailand by the Institute for Population and Social Research (IPSR), Mahidol University and supported by the Wellcome Trust, United Kingdom. Data was collected every year from 2000 to 2004 from every household and individual in the field area. According to the report of round 2 survey in 2001 (IPSR, 2003), 18 percent of the population in KDSS were movers. Among them, 8 percent were moving in and 10 percent were moving out. In general, migration in KDSS was short-distance, within Kanchanaburi province, and between Kanchanaburi and other provinces in the Central region and Bangkok.

The sample size for this study includes 22,336 persons aged 15-59 years. Among them, there are 10,016 males or 45 percent and 12,320 females or 55 percent.

Migration status is identified by using household questionnaires from round 2 (2001) and round 3 (2002). A person was defined as a labor migrant if:

1) s/he was in working ages 15-59 in 2001;

2) s/he was classified as working or looking for a job at the time of round 2; and

3) s/he was in a household list at the time of round 2 but crossed village boundary in round 3 i.e. moving within 12 months prior the time of round 3.

This definition excludes persons aged 15-59 but studying, doing housework or not working due to sickness, invalid, caring children and elderly, etc. at the time of round 2. Crossing village boundary is used as criterion for identifying migrants. Information of all persons aged 15-59 was collected from round 2 individual and household questionnaires or in the other way, at the beginning of migration process.

Individual and household characteristics of labor migrants are discussed and compared to non-migrants by descriptive analysis. Then, multivariate analysis is applied to identify determinants and major predictors of labor migration in KDSS for the overall population and for male and female separately. Since the dependent variable in this study (migration status) is a binary variable, binary logistics regression is an appropriate method to examine the impact of independent variables on dependent variable (Clark, 1992; Pampel, 2000).

The effects of independent variables are examined at different levels i.e. individual, household and village and are grouped into four sets.

The first set of independent variables includes individual social and demographic factors. Individual demographic factors such as sex, age, residence, marital status and ethnicity are expected to have influence on migration decision. Human capitals such as education and prior migration experience are believed to have impact on migration (Massey and Espinosa, 1997). Variable “single” is used to indicate marital status of that person to be single or not. Ethnicity (Thai or non-Thai) is identified from language used for communication in household. Prior migration experience is based on whether that person has crossed village boundary and stayed for more than 1 month during 12 months prior to the time of round 2 (2001) from the individual questionnaire. Variable membership states whether that person belongs to a social group/club or not.

The second set of variable considers the impact of individual economic variables on migration. Two variables are used including individual unemployment status and working in agricultural field or not. Unemployment is identified based on work status. Person who does not work and looks for a job is considered as unemployed.

Five household economic variables are considered in the third set. They are number of labor in household, house index, house characteristics index, household asset

index and household debt. Principle Component Method is used to construct house index, house characteristics index and household asset index (Filmer and Pritchett, 2001; Landau and Everitt, 2004). House index is constructed from type of house (single, twin-house, block/shop house, etc.), material of the roof (cepack, tile, zinc plate, etc.) and material of the house walls (concrete, brick, tile, zinc, bamboo, etc.). House characteristics index is constructed form living conditions of the household such as electricity, fuel for daily life, water, drinking water and water for household use. And household asset index is constructed from a list of items in the household (television, telephone, computer, air conditioner, washing machine, etc.).

The last set covers four village-level variables. They are village unemployment rate, percentage of land area for agricultural use, village infrastructure index and proportion of labor migrants in village. When inputting into equation, percentage of land area for agricultural use is taken logarithm to make normal distribution. Village unemployment rate is calculated by dividing number of persons looking for a job to working age population in that village. Village infrastructure index is constructed from list of infrastructure and transportation (public telephone, broadcasting tower, radios, internet, type of main road for travel within village and to the district) by the principal component method. Percentage of labor migrants in the village is calculated from the number of labor migrants to the total labor of that village. For 14 urban blocks where information was not collected, estimated values on infrastructure and transportation system were assigned.

Results and Discussion

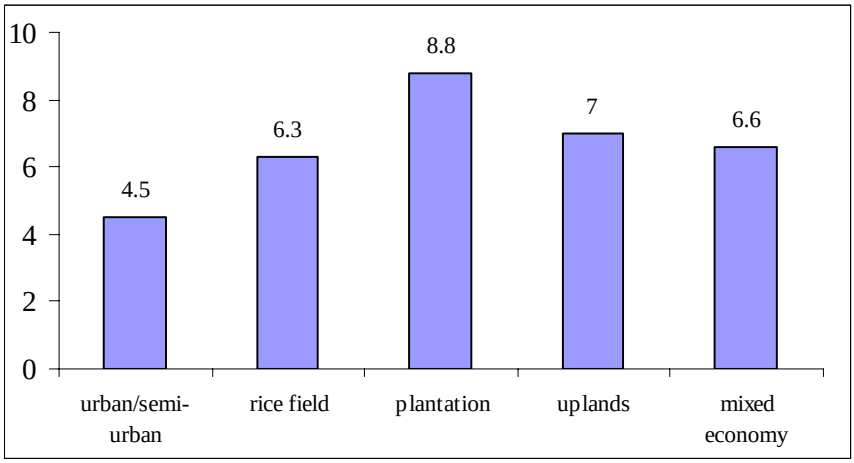
1. Level and duration of labor migration

Between round 2 and round 3, there were 1,469 persons or 6.6 percent of total labors aged 15-59 moving out of their households and crossing village boundary during 12 months prior the time of round 3. Percentages of migrants by strata are presented in Figure 1.

Percentage of migrants was highest in plantations (8.8 percent) and followed by uplands (7 percent). The two strata are the poorer than the others making people more likely to move to look for works and better income in other places. Percentages of migrants were closed to the average in rice field and mixed economy (6.3 and 6.6

percent respectively). Urban/semi-urban stratum had the lowest migration rate of 4.5 percent. Probably, due to higher concentration of industries, this stratum is destination for labor migrants rather than origin.

Figure 1
Percentage of migrants by strata



Note: Percentage of migrants is calculated by dividing number of labor migrants by total working population for each stratum at the time of survey round 2, multiplied by 100.

The differences in percentage of migrants by strata were not influenced by the age structure. According to report of round 2 survey (Guest and Punpuing (eds.), 2003), working age population accounted for 60.2 percent of total population in KDSS. The percentage of working age population was highest in urban/semi-urban stratum (64.3 percent) and lowest in uplands stratum (56.3 percent). The figures were 59 percent, 60.7 percent and 61.8 percent in rice, plantation and mixed economy stratum respectively. Age structures among working ages were similar between strata (data not shown here). It was observed that percentage of migrants was lowest in urban/semi-urban stratum (highest working age population) and highest in plantation stratum (with lower working age population).

Among labor migrants, people from uplands accounted for more than one-fourth of the total migrants, followed by mixed economy and plantation (22 percent

each). There were much fewer migrants from urban/semi-urban stratum (less than 14 percent).

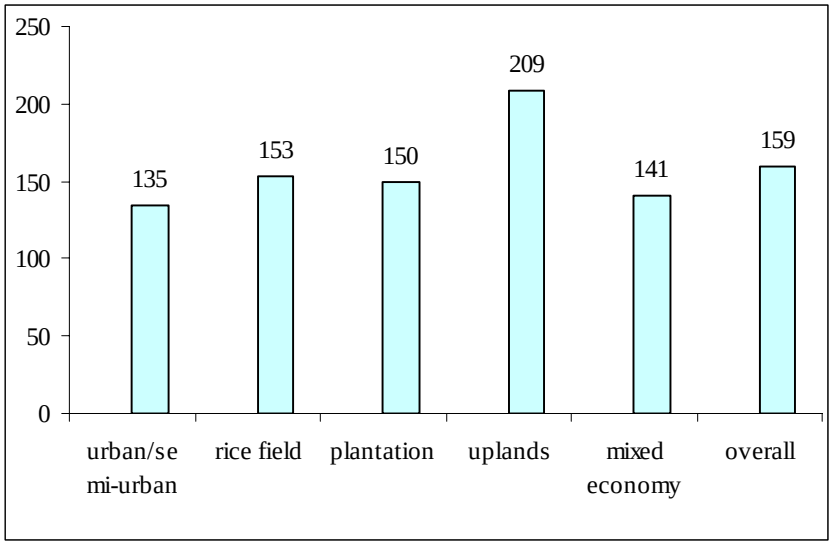
Majority of migrants undertook short-distance move within Kanchanaburi. More than 50 percent of total migrants migrated to municipality places. About 48 percent moved to rural areas while only 2 percent went abroad.

Since the study concerned only migration occurring during 12 months prior the time of census round 3 i.e. from July 2001 to June 2002, migration duration ranged from 1 month to 12 months. If a person migrated in July 2001, migration duration was 12 months by June 2002. If s/he moved out in June 2002, migration duration was 1 month. Though people moved around the year, the observation showed that people were more likely to move out during June, July and August. Number of migrants during those three months accounted for almost half of the total migrants within the last 12 months prior census round 3. People were less likely to migrate during New Year and Songkhran festival i.e. from January to April. The explanations might be that most of the moves were short-distance, somewhat temporary and from place of origin, so that people were more likely to be at home than go away during the time of New Year and Songkhran festival. Among migrants in KDSS, those moving for more than 6 months i.e. from July to December 2001 accounted for about two-third of the total migrants. The time of out-migration in KDSS was contradicted to research findings by Guest (1998) that temporary migration inflow to Bangkok and surrounding areas occurred during the dry-season and the outflow was in the wet season.

2. Migration selectivity and differentials

Sex selectivity was also clear from the KDSS data. While 9 percent of males moved, the figure was only half (4.6 percent) for females. Among migrants, males accounted for 61.4 percent resulting in a sex ratio of 159, much higher than the overall sex ratio for the whole labor force (81 males per 100 females). Low sex ratios and no significant differences were found in all strata and in different rounds suggesting that low sex ratio was not the impact of male out migration. Sex ratios of labor migrants by strata are presented in Figure 2.

Figure 2
Sex ratio of labor migrants by strata



Note: Sex ratio is defined as the number of males per 100 females.

Sex ratios varied greatly across the strata. Exceptionally high sex ratio (209), comparing to the overall and other strata, was found in the upland stratum. Possible explanation was that uplands stratum was far away from other places and more difficult to move so that males were much more likely to migrate than females. In addition, it should be noted that in uplands stratum, there were more female labors than males (2,919 compared to 2,660). The other four strata had lower sex ratio than the overall. The lowest sex ratio of 135 was found in the urban/semi-urban stratum. The result was contradicted to increasing pattern of female migrants somewhere else but consistent with migration research in Thailand (Tangchonlatip, et al., 2006).

Similar to findings from other research, labor migrants in KDSS were predominantly young ages. Persons in young age groups of 15-24 were more likely to migrate than in the other age-groups. Age group of 20-24 had highest percentage of migrants (15.3 percent), followed by age group of 15-19 (12.1 percent). Similar patterns were observed among both sexes.

Migrants and non-migrants differ with respect to marital status. Single persons at the time of round 2 were much more active in moving than married and

others groups. Percentages of migrants among single persons were almost double or triple the figures in the other groups (12.3 percent compared to 4.7 percent for married category and 7 percent for others category). However, in absolute number, among the migrants, married persons accounted for 51 percent of total migrants, much higher than the percentage of singles (41 percent). In contrast, married persons accounted for up to 73 percent among non-migrants. The pattern of migration by marital status was quite similar for both sexes.

People with secondary or higher education at the time of round 2 were more likely to move than those illiterate or with primary education (7.4 and 7.3 percent compared to 6.6 and 4.7 percent respectively). It suggested that jobs might be more available for persons with higher education than the lower ones. However, in absolute number, migrants with no education and elementary education accounted for almost 70 percent of the total migrants.

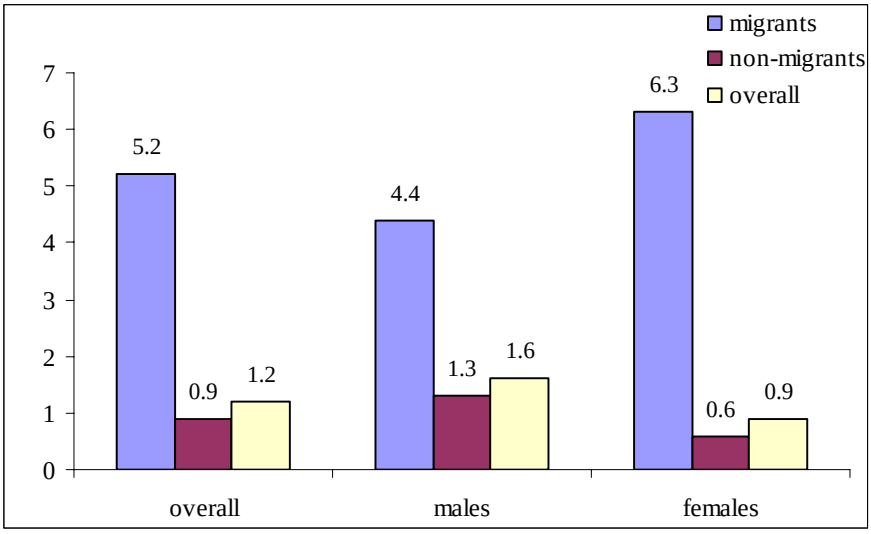
Migrants and non-migrants were different regarding their work status. Work status was recoded at the time before migration (i.e. round 2), not at the time of migration or after migration. Since only persons recorded as working or looking for a job at the census round 2 were taken into consideration as labor migrants, all migrants fell into either category of working or look-for-a-job/unemployment. No migrant was classified into category “others” i.e. doing housework, sick, caring for children/elderly, not working, etc. Persons recorded as working before migration were much less likely to move compared to those stating as unemployed or look-for-a-job (7.7 percent compared to 29 percent). However, since unemployed accounted for a very small proportion, majority of migrants were those working (95 percent). It was clear that people moved not only to look for a job but also change their jobs to earn more money. Percentage of migrants by work status might change if the question was asked at the time of migration or after migration. Percentage of unemployment might be higher at the time of migration and probably lower after migration.

Though the general pattern was similar for both sexes, there were still clear differences. It was common to find out that males were more likely to migrate than females even when they were still having job (9.6 percent compared to 5.8 percent for females). Percentages of migrants were very high among those unemployed regardless of their sex. The results meant that when being unemployed, both males and females were more likely to move and look for a job to earn money for their and families’ living. However, it was a surprise to see that percentage of migrants who were looking

for a job was much higher for females than for males (34.3 percent compared to 25.5 percent). It might be the cultural reason that in Thailand women had been playing an active economic role in the families for long time. In addition, most of the moves were short-distance so that it could be easier for women to get involved.

For the whole labor force, at the time of census round 2, 81.5 percent reported as working and 17.3 percent in other status i.e. doing housework, sickness, caring for children/elderly, etc. It revealed a low unemployment rate of 1.2 percent. Information on unemployment is presented in Figure 3.

Figure 3
Unemployment rate by migration status and sex



Note: Unemployment rate is calculated by dividing number of unemployed by total working age population by migration status and sex at round 2.

As predicted by Todaro (1969), unemployment was more prevalent among migrants than non-migrants. At the time of round 2, unemployment rate was 5.2 percent among migrants, five times higher than the unemployment rate among non-migrants (0.9 percent).

Similar pattern was found in both sexes. In general, males had higher unemployment rate than females (1.6 percent compared to 0.9 percent) and

unemployment rates were much higher among migrants for both sexes than among non-migrants. But unemployment rate was higher among female migrants than male counterparts (6.3 percent compared to 4.4 percent). It was possible that females were facing more difficulties when looking for a job.

Apart from unemployed who have stronger motive to migrate, it is necessary to look at migrants who have worked at the beginning of migration process. Among three main occupations in Kanchanburi i.e. agriculture, factory work and trading/commerce which accounted for 65 percent, 12 percent and 10 percent of the labor force respectively, highest percentage of migrants was found in factory works (10.6 percent), followed by agriculture (7.5 percent) and trading/ commerce (5.9 percent).

In this study, previous migration experience is used as an indicator for migration-specific human capital. According to social capital theory, migration experience is one of important predictors for migration process (Massey, 1990; Massey, et al., 1993). Persons having migration experience were more likely to move. Among those having migration experience, about 20 percent moved again within 12 months prior the time of census round 3 (2002). This figure was four times higher than the one of only 5 percent migrating among those having no migration experience.

In general, the socio-demographic characteristics of labor migrants in KDSS were similar with migrants in other contexts (Todaro, 1997; Guest, 1998; Ping and Pieke, 2003; Deshingkar and Grimm, 2005).

3. Migration and housing characteristics

As found in various studies (Findley, 1987), persons living in bigger households (5-6 and 7+ persons) were more likely to migrate than those living in smaller households. Among migrants, persons from big households of 5 or more at the time of round 2 accounted for 62 percent of total migrants. The figure was only 44 percent among non-migrants. The results were similar when looking at the number of labor in household only. Persons from household having 3 or more labors encompassed 64 percent of total migrants but only 43 percent of total non-migrants.

Regarding house characteristics, there was a number of household variables being examined such as type of house, house characteristics, living conditions,

household debt and household asset index. Since the differences between migrants and non-migrants were very small concerning different indicators of household wealth and especially when taking the fact that the measurements might not be very precise, it could be concluded that there was no bivariate relationship between household wealth and migration.

4. Multivariate analysis

Results of binary logistics regression analysis of labor migration in KDSS are presented in Table 1. The results are for the overall population and for each sex separately. For the convenience of interpretation, only the exponential of logistics regression coefficients or odds are presented. Effects of independent variables on labor migration are discussed bellow.

Table 1: Determinants of labor migration in KDSS

Variables	**Overall** Exp(B)	**Male** Exp(B)	**Female** Exp(B)
Constant	0.03***	0.02***	0.09***
Individual socio-demographic factors			
Sex			
Female (ref.)			
Male	1.77***	-	-
Age	1.00	1.04*	0.94*
Age square	1.00**	1.00***	1.00
Residence			
Urban/semi-urban (ref.)			
Rice field	1.72***	1.74***	1.77**
Plantation	2.15***	2.00***	2.43***
Uplands	2.11***	2.34***	1.92***
Mixture	1.76***	1.78***	1.79***
Single	1.42***	1.64***	1.23
Ethnicity			
Non-Thai (ref.)			
Thai	1.37**	1.20	1.47
Educational level			
Illiterate (ref.)			
Elementary	1.22*	1.71***	0.85
Secondary	0.91	1.29	0.59**
Higher secondary	1.48**	1.34	1.46
Prior migration experience	3.35***	3.10***	3.75***
Membership of a social group/club	0.7***	.644***	0.794*
Individual economic factors			
Unemployment	0.32***	0.45***	0.20***
Agricultural work	1.80***	1.55***	2.29***

Table 1: (Continued)

Variables	Overall Exp(B)	Male Exp(B)	Female Exp(B)
Household factors			
Number of labor in household	1.30***	1.25***	1.37***
House index (type, roof, wall)	1.02	0.99	1.04
House characteristics index	1.03**	1.03	1.03*
Household asset index	0.96***	0.95***	0.98
Household debt	1.05	1.02	1.08
Contextual factors			
Village unemployment rate	1.13***	1.10**	1.17***
Log of percentage of land area for agricultural use in village	0.97	0.90**	1.07
Village infrastructure index	1.04**	1.02	1.07***
Proportion of labor migrants	1.00	0.99	1.00
R square	0.066	0.07	0.054
Sample size	22,336	10,016	12,320

Note: *** Significant at 0.01 level

** Significant at 0.05 level

* Significant at 0.1 level

Among social and demographic factors, sex, residence, marital status and ethnicity showed highly statistically significant impact on migration. The odd of migration was 77 percent larger for male than female. Single persons had odd of migration 42 percent larger than married, windowed, divorced, etc. Thai ethnic also had 37 percent of odd of migration larger than non-Thai.

Persons living in plantation and upland strata had the odds of migration 115 percent and 111 percent larger than persons living in urban/ semi-urban stratum. It was possible that in urban/semi-urban stratum, jobs or higher income jobs were more available than in other strata. Thus, people living there were less likely to move. The results were consistent with the segmented labor market theory with the assumption that persons moved due to labor demand in more industrial places (Piore, 1979 cited in Massey and Espinosa, 1997; Massey, Arango, Hugo, et al., 1993).

It was a surprise to find that age had no impact on labor migration in KDSS. The impact of education was also not clear and highly significant. People with higher secondary education had 48 percent larger odd of migration compared to illiterate. However, high education persons accounted for only a small proportion of the

population. The reasons could be that most of the moves were short-distance i.e. within Kanchanaburi and somewhat for a short-time period.

Migration experience is considered as an important indicator of migration-specific human capital (Massey, et al., 1993). It has been found to have considerable impact on probability of migration in various studies (Massey and Espinosa, 1997). Regression result also supports this hypothesis. Persons having prior migration experience were more likely to move. The odd of migration for persons having prior migration experience was 3.35 times higher than those having no experience. The impact was highly statistically significant. Since the migration in KDSS is mainly short-distance and short-term i.e. circular or seasonal migration, this relationship is somewhat expected.

Being member of a social group/club reduced the probability of migration. The impact was highly significant. Possible explanation was that the social group/club probably played an important role in village development and created more activities regarding works and social life which kept people less moving.

When looking at the impact of individual economic variables on migration, the direction of unemployment variable was not as expected. Regression results showed that being unemployed decreased the odd of migration by 68 percent. This finding was contradicted to findings from other research (Schlottmann and Herzog, 1981) that unemployment pushed people to move for job and earnings.

People engaging in agriculture work are more likely to have lower income due to fewer economic opportunities than in industries and services sectors (Stark and Bloom, 1985; Massey and Espinosa, 1997). Logistics regression result showed that working in agriculture increased odd of migration of a person by 80 percent compared to a person doing other jobs. The impact of individual economic factors was highly significant.

The third set brings into consideration the impact of household factors. Number of labor in household appeared to have significant and stronger impact on migration (Findley, 1987). As expected, more labor in a household, especially in rural areas with shortage of land for agriculture, may give some persons higher probability of migrating for extra earning to sustain their families (Lauby and Stark, 1988). In this

study, when number of labor in household was increased by one, odd of migration increased by 30 percent. The impact was highly significant.

The impact of other four household economic variables appeared not strong regardless it was significant or not. Probably migrants and non-migrants were in similar household economic conditions as mentioned in the bivariate analysis.

Lastly, impact of village variables on migration was examined. Out of four variables, only village unemployment rate had a relatively small influence on labor migration. The exponentiated coefficient revealed that one percent increase in village unemployment rate resulted in an increase of 13 percent of odd of migration. Weak influence of village variables could be explained by the fact that most of the move in KDSS was short-distance and in short-time period.

The exponential of regression coefficients for males and females are also presented in Table 1. In general, the exponentiated coefficients were not much different from the overall ones regarding their values and direction. Exceptions were as follows:

The effect of residing in plantation stratum was stronger for female, while residing in upland had stronger effect on male. A female living in plantation stratum had the odd of migration 2.43 times higher than a female living urban stratum. It was only 2 times higher for a male. Vice versa, a male living upland stratum had 2.34 times higher odd of moving than a male living in urban area. The odd was 1.92 times higher for a female. As explained above, people living in those two strata were more likely to migrate than the other three. However, since respondents indicated that quality of road was a problem in all strata, especially in the uplands. This difficulty might jeopardize migration probability among females. That was why there were many more male migrants than females moving out uplands stratum. Road system was probably better in plantation stratum, so that more females could move.

Marital status (single) became insignificant for females while showing stronger influence for males i.e. odd of migration was 1.64 time higher for single male than others. The effect of ethnicity also became insignificant for both sexes.

Educational level showed unclear impact on female migration. For males, significant impact occurred only from illiterate to elementary education i.e. odd of

migration increased 71 percent. It might imply a low level of education among male migrants.

Impact of prior migration experience was strong and highly significant for both sexes. However, the impact for females appeared stronger than that for males. Similarly, being membership of a social group/club had stronger impact on female than male. However, the effect was less significant for female though males were thought to have more roles in community development than females.

Individual economic factors showed the same direction and significant impact on male and female migration. But, the impact of unemployment variable on male migration was stronger than female one, while the impact of working in agriculture was reversed i.e. the odd of migration among females working in agriculture increased much higher than among males (2.29 times compared to 1.55 times).

Household factors showed almost no effect on migration for both sexes, except the variable "number of labor in household". The impact was highly significant and somewhat similar for both sexes.

Village unemployment rate and infrastructure index seemed to have relatively stronger and highly significant impact on female migration. Village unemployment rate and percentage of land for agricultural use showed certain impact on male migration.

In identifying the most powerful predictors of labor migration in Kanchanaburi, the exponential of regression coefficients themselves from Table 1 can be considered. However, because independent variables have different scale of measurement, it makes the comparison between exponentiated coefficients difficult in identifying exactly the effect magnitude of independent variable on labor migration.

One way to judge the strength of the effects of independent variables on labor migration is to generate predicted probability of migration based on the exponential of regression coefficients in Table 1. This method has been discussed by Pampel (2000) and employed by Massey and Espinosa (1997).

Since percentage of migrants was highest among 20-24 age-group, age was held constant at 22 years when generating the predicted probability of labor migration

to see what was situation of a young person regarding migration. Firstly, mean predicted probability of labor migration was calculated with mean value of all independent variables and at age 22. Then, predicted probability for each independent variable (except age variable) was generated with two values while assuming mean value for all other independent variables as follows:

- For nominal and ordinal variables: One value for reference group and one for the impact group.
- For household interval variables: One value at the 5^{th} percentile and one at the 95^{th} percentile. By taking values at 5^{th} and 95^{th} percentiles, it helped to reduce the effect of outliers.
- For village interval variables: One value at the 1^{st} percentile and one at the 99^{th} percentile. The reason was that number of cases for village data was limited i.e. 100 cases, so that the effect of outlier was not as big as for household data.

Range between the two generated predicted probabilities showed the effect of each independent variable on migration. When comparing the range to the mean predicted probability, the greater range indicated stronger effect on migration. For KDSS data, the cutting point was 50 percent greater than the mean.

Predicted probabilities of labor migration are given in Table 2.

Table 2: Effect of independent variables on labor migration and by sex

Independent variable	Predicted probability of labor migration		
	Overall	Male	Female
Socio-demographic factors			
Residence			
Urban/semi-urban (ref.)	0.132	0.127	0.153
Rice field	0.208	0.202	0.242
Plantations	0.247*	0.225	0.305*
Uplands	0.243*	0.253*	0.257
Mixture	0.211	0.205	0.244
Single	0.254	0.269	0.265
Ethnicity			
Non-Thai (ref.)	0.162	0.177	0.175
Thai	0.209	0.204	0.238
Educational level			
Illiterate (ref.)	0.186	0.147	0.234
Elementary	0.219	0.227	0.234
Secondary	0.172	0.181	0.174
Higher secondary	0.253	0.187	0.344

Table 2: (Continued)

Independent variable	Predicted probability of labor migration		
	Overall	Male	Female
Prior migration experience			
No	0.185	0.181	0.213
Yes	0.431*	0.407*	0.504*
Membership of a social group/club			
No	0.193	0.181	0.213
Yes	0.144	0.125	0.177
Individual economic factors			
Unemployment			
No	0.208	0.204	0.236
Yes	0.077*	0.103	0.058*
Agricultural work			
No	0.159	0.164	0.170
Yes	0.255*	0.233	0.319*
Household factors			
Number of labor in household			
1 persons (min.)	0.143	0.147	0.155
5 persons (max.)	0.324*	0.295*	0.396*
House index (type, roof, wall)			
At 5th percentile (min.)	0.200	0.204	0.223
At 95th percentile (max.)	0.210	0.201	0.243
House characteristics index			
At 5th percentile (min.)	0.167	0.167	0.181
At 95th percentile (max.)	0.217	0.214	0.249
Household asset index			
At 5th percentile (min.)	0.240	0.249	0.252
At 95th percentile (max.)	0.155	0.138*	0.205
Household debt			
No	0.200	0.200	0.224
Yes	0.208	0.203	0.239
Contextual factors			
Village unemployment rate			
At 1st percentile (min.)	0.183	0.185	0.202
At 99th percentile (max.)	0.290*	0.267	0.354*
Log of percentage of land area for agricultural use in village			
At 1st percentile (min.)	0.225	0.267	0.194
At 99th percentile (max.)	0.201	0.190	0.244
Village infrastructure index			
At 1st percentile (min.)	0.184	0.192	0.191
At 99th percentile (max.)	0.272	0.232	0.374*
Proportion of labor migrants from village			
At 1st percentile (min.)	0.209	0.210	0.230
At 99th percentile (max.)	0.200	0.190	0.240
Mean predicted probability	**0.20**	**0.19**	**0.22**

Note: * Range greater than 50 percent of mean predicted probability

The overall mean predicted probability is 0.2 meaning that a 22 year old person has about 20 percent chance of undertaking a move to a place outside his/her village keeping all other independent variables at the mean values. The probability changes corresponding with value change of other independent variables. Similar probability of migration is 19 percent and 22 percent chance for a 22 year-old male and female respectively.

The most powerful effect is found with the variable of migration experience – an indicator of migration-specific human capital. The predicted probability of migration increases from 18.5 percent for person having no migration experience to 43 percent for those with prior migration experience.

Another individual variable also has strong effect on migration is unemployment status. However, the direction of the effect is not as expected. The predicted probability of migration decreases from 21 percent for unemployed persons to only 8 percent for those not classified as unemployed.

Number of labor in household is the only household variable showing strong effect on migration. If a person is the only labor in household, the predicted probability of migration is only 14.3 percent. However, if that person is in a household of five labors or more, the predicted probability increases to more than 32 percent.

Other variables having strong effect on labor migration include residence (especially people living in plantation and upland strata), working in agriculture and village unemployment rate. To a certain extent, place of residence and village unemployment rate reflect the level of community development. People are more likely to move from lower development places to higher development ones as assumed by the segmentation labor market theory (Piore, 1979 cited in Massey and Espinosa, 1997; Massey, et al., 1993). From the classification of strata in KDSS, plantations and uplands are quite obvious to be poorer than the others and people living in the two strata are more likely to move.

The effect direction of village unemployment rate on migration is as expected (Findley, 1987) meaning that villages with higher unemployment rate are more likely to send out their labors. Unemployment rate can be used as a proxy indicator for village development. Higher unemployment rate may imply lower level of development.

Income from agricultural working is commonly lower than in industries and services leading to higher migration rate. The finding is consistent with the assumption of rational choice of migrants (Sjaastad, 1962).

Major predictors for labor migration greatly vary by sex. Residence in upland stratum, prior migration experience, number of labor in household and household asset index are strong predictor for male labor migration. In contrast, apart from prior migration experience and number of labor in household, other strong predictors for female labor migration include residence in plantation stratum, unemployment, working in agriculture, village unemployment rate and village infrastructure index.

5. Discussion

Study findings suggest that, in general, labor migrants in KDSS share many similar characteristics compared to other groups of migrants in previous migration literature i.e. sex, age, work status, marital status, household characteristics and village characteristics. However, differences were also found regarding timing of migration and educational level. Determinants of labor migration are also found quite consistent with other studies on migration.

After considering the effect of independent variables at different levels on migration propensity, it is concluded that the forces to labor migration process in KDSS are diverse including individual, household level and village levels.

Migration-specific human capital – prior migration experience itself – is the most important force to promote labor migration. A person having prior migration experience means that he/she accumulates more working skills, work experience as well as experience to deal with problems when working away from home. So, once a person migrates, the probability of repeat migration is much higher.

Consistent with neoclassical migration theory (Sjaastad, 1962), migrants tend to move to places where their skills and ability are more relevant. Imbalanced development between strata makes labors in poorer strata to move for better earning and more availability of jobs. Labors working in agriculture are also more likely to move for better earnings. The same motive of moving is expected for labors in village with higher unemployment rate.

In more crowded households, sending some members away for extra income is considered as family strategy to reduce economic risk (Findley, 1987; Lucas, 1997). Number of labor in household is a powerful predictor for labor migration. Persons in bigger households i.e. more labors are more likely to move. Since majority of labor force in KDSS works in agriculture, shortage of land or lower income are possible reasons for the move.

Migration probability of male and female is influenced by different factors. Individual and household factors appear to have strong impact on male migration, while individual and contextual factors are strong predictors for female migration.

Acknowledgement

The authors would like to thank the Wellcome Trust/IPSR for providing the scholarship that made this research possible. Thanks also go to all the researchers and staff of the Institute for Population and Social Research (IPSR) for their kind support.

References

Afsar, R. 2003. *Dynamics of poverty, development and population mobility: the Bangladesh case*. Paper presented at the Ad Hoc Expert Group Meeting on Migration and Development. Bangkok, Thailand.

Chamratrithirong, A; Archvanitikul, K; Richter, K; Guest, P; Thongthai, V; Boonchalaksi, W; Piriyathamwong, N and Vong-Ek, P. 1995. *The National Migration Survey of Thailand*. Nakhon Pathom: Institute for Population and Social Research (Publication no.188).

Clark, W.A.V. 1992. Comparing cross-sectional and longitudinal analyses of residential mobility and migration. *Environment and Planning A*, 24: 1291-1302.

Da Vanzo, J. 1981. Microeconomic approaches to studying migration decisions. In, *Migration Decision Making*, pp.90-129. London: Pergamon Press.

Dang, N.A; Tacoli, C and Hoang, X.T. 2003. *Migration in Vietnam: Theoretical approaches and Evidence from a survey*. Paper presented at the Regional Conference on Migration, Development and Pro-Poor Policy Choices in Asia. Dhaka, Bangladesh.

De Jong, G.F. 2000. Expectations, genders and norms in migration decision-making. *Population Studies***,** 54: 307-319.

Deshingkar, P and Grimm, S. 2005. *Internal Migration and Development: A Global Perspective*. Paper prepared for International Organization for Migration (IOM).

Filmer, D and Pritchett, L.H. 2001. Estimating Wealth Effects without Expenditure Data or Tears: An Application to Educational Enrollments in States of India. *Demography***,** 38(1): 115-132.

Findley, S.E. 1987. An interactive contextual model of migration in Ilocos Norte, the Philippines. *Demography***,** 24(2): 163-190.

Guest, P. 1998. Assessing the Consequences of Internal Migration: Methodological Issues and a Case Study on Thailand Based on Longitudinal Household Survey Data. In, *Migration, Urbanization and Development: New Directions and Issues*, pp.275-318. New York: United Nations Population Fund.

_____. 2003. *Bridging the gap: internal migration in Asia*. Paper presented at the Conference on African Migration in Comparative Perspective. Johannesburg, South Africa.

Guest, P and Punpuing, S. 2003. *Report of Round 2 Survey (2001).* Nakhon Pathom: Kanchanaburi Project, Institute for Population and Social Research.

_____. 2004. *Report of Round 3 Survey (2002).* Nakhon Pathom: Kanchanaburi Project, Institute for Population and Social Research.

Landau, S and Everitt, B.S. 2004. *A Handbook of Statistical Analyses using SPSS*. London, New York, Washington, D.C: Chapman & Hall/CRC.

Lauby, J and Stark, O. 1988. Individual migration as a family strategy: Young women in the Philippines. *Population Studies***,** 42: 473-486.

Lee, E.S. 1966. A Theory of Migration. *Demography***,** 3(1): 47-57.

Lucas, R.E.B. 1997. Internal Migration in Developing Countries. In, *Handbook of Population and Family Economics*, Vol.1B, pp.721-798. Amsterdam: Elsevier Science B.V.

Massey, D.S. 1990. Social structure, household strategies and the cumulative causation of migration. *Population Index***,** 56(1): 3-26.

Massey, D.S; Arango, J; Hugo, G; Kouaouci, A; Pellegrino, A and Taylor, J.E. 1993. Theories of International Migration. *Population and Development Review***,** 19: 231-266.

Massey, D.S and Espinosa, K.E. 1997. What's Driving Mexico-U.S. Migration? A Theoretical, Empirical and Policy Analysis. *The American Journal of Sociology***,** 102(4): 939-999.

Pampel, F.C. 2000. Logistic Regression (vol. 132). In, *Series: Quantitative Applications in the Social Science.* Thousand Oaks, London, New Delhi: Sage Publications, Inc.

Ping, H and Pieke, F.N. 2003. *China migration country study*. Paper presented at the Regional Conference on Migration, Development and Pro-Poor Policy Choices in Asia. Dhaka, Bangladesh.

Porpora, D and Lim, M.H. 1987. The political economic factors of migration to Bangkok. *Journal of Contemporary Asia***,** 17(1): 76-89.

Richter, K; Guest, P; Boonchalaski, W; Piriyathamwong, N and Ogena, N.B. 1997. *Migration and the rural families: Sources of support and strain in a mobile society*. Nakhon Pathom: Institute for Population and Social Research.

Schlottmann, A.M and Herzog, H.W. 1981. Employment Status and the Decision to Migrate. *The Review of Economics and Statistics***,** 63(4): 590-598.

Sjaastad, L.A. 1962. The costs and returns of human migration. *The Journal of Political Economy***,** 70(5): 80-93.

Soonthorndhada, A. 1987. Circular Mobility of Female Laborers and Economic Development in Thailand. In, *Visiting Research Fellow Monograph Series No. 140.* Tokyo: International Exchanges Department, Institute of Development Economies.

Srivastava, R and Sasikumar, S.K. 2003. *An overview of migration in India, its impact and key issues*. Paper presented at the Regional Conference on Migration, Development and Pro-Poor Policy Choices in Asia. Dhaka, Bangladesh.

Stark, O and Bloom, D.E. 1985. The New Economics of Labor Migration. *Frontiers in Demographic Economics*, 75(2): 173-178.

Stillwell, J and Condon, P. 1991. Migration modeling: concepts and contents. In, *Migration models: macro and micro approaches*, pp.1-16. London: Belhaven Press.

Tangchonlatip, K; Punpuing, S; Chamratrithirong, A; Guest, P; Curran, S and Rachapnetayakom, J. 2006. Migration and Gender-based Occupational Segregation in Bangkok. *Journal of Population and Social Studies*, 15(1): 53-80

Todaro, M.P. 1969. A Model of Labor Migration and Urban Unemployment in Less Developed Countries. *The American Economic Review***,** 59(1): 138-148.

_____. 1997. *Urbanization, Unemployment and Migration in Africa: Theory and Policy*. Paper prepared for Reviewing Social and Economic Progress in Africa.

Appendix

Table A: Percentage distribution by migration status and various characteristics in KDSS

Characteristics	Overall		Male		Female	
	Migrant	*Non-migrants*	Migrant	*Non-migrants*	Migrant	*Non-migrants*
Sex						
Male	9.0	*94.0*	-	-	-	-
Female	4.6	*95.4*	-	-	-	-
Age groups						
15-19	12.1	*87.9*	14.6	*85.4*	9.8	*90.2*
20-24	15.3	*84.7*	22.1	*77.9*	10.2	*89.8*
25-29	9.5	*90.5*	13.0	*87.0*	6.8	*93.2*
30-34	6.0	*94.0*	8.7	*91.3*	3.8	*96.2*
35-39	4.1	*95.9*	5.6	*94.4*	2.9	*97.1*
40-44	3.5	*96.5*	5.7	*94.3*	1.9	*98.1*
45-49	2.6	*97.4*	3.6	*96.4*	1.7	*98.3*
50-54	2.8	*97.2*	3.6	*96.4*	2.1	*97.9*
55-59	1.6	*98.4*	2.3	*97.7*	1.1	*98.9*
Marital status						
Married	4.7	*95.3*	6.3	*93.7*	3.4	*96.6*
Others	7.0	*93.0*	11.7	*88.3*	5.6	*94.4*
Single	12.3	*87.7*	16.5	*83.5*	8.4	*91.6*
Ethnicity						
Non-Thai	5.8	*94.2*	8.2	*91.8*	3.5	*96.5*
Thai	6.6	*93.4*	9.1	*90.9*	4.7	*95.3*
Educational level						
Illiterate	4.7	*95.3*	6.6	*93.6*	3.6	*96.4*
Elementary	6.6	*93.4*	9.6	*90.4*	4.2	*95.8*
Secondary	7.4	*92.6*	9.2	*90.8*	5.5	*94.5*
Higher secondary	7.3	*92.7*	7.0	*93.0*	7.5	*92.5*
Prior migration experience						
Yes	19.7	*80.3*	24.3	*75.7*	15.0	*85.0*
No	5.0	*95.0*	6.9	*93.1*	3.5	*96.5*
Membership of a social group/club						
Yes	3.8	*96.2*	4.9	*95.1*	3.0	*97.0*
No	7.6	*92.4*	10.4	*89.6*	5.2	*94.8*
Work status						
Working	7.7	*92.3*	9.6	*90.4*	5.8	*94.2*
Unemployed	29.0	*71.0*	25.5	*74.5*	34.3	*65.7*

Table A: (Continued)

Characteristics	Overall		Male		Female	
	Migrant	*Non-migrants*	Migrant	*Non-migrants*	Migrant	*Non-migrants*
Main occupation						
Professionals/physician/nurse/ Engineer	5.1	*94.9*	6.1	*93.9*	4.4	*95.6*
Administration/management	4.0	*96.0*	5.4	*94.6*	0.0	*100*
Clerk	9.9	*90.1*	10.7	*89.3*	9.5	*90.5*
Trading/commerce	5.9	*94.1*	6.2	*93.8*	5.7	*94.3*
Services	7.4	*92.6*	6.7	*93.3*	8.0	*92.0*
Agriculture	7.5	*92.5*	9.9	*90.1*	5.1	*94.9*
Transportation/communication	9.3	*90.7*	9.6	*90.4*	0.0	*100*
Factory works	10.6	*89.4*	11.9	*88.1*	9.2	*90.8*
Others	7.8	*92.2*	9.1	*90.9*	5.6	*94.4*
Village unemployment rate						
Low (<1 percent)	6.9	*93.1*	9.6	*90.4*	4.6	*95.4*
Medium (1-3 percent)	5.8	*94.2*	7.8	*92.2*	4.3	*95.7*
High (>3 percent)	7.8	*92.2*	10.3	*89.7*	6.0	*94.0*
Log of percentage of land area for agricultural use in village						
Low (<30 percent)	6.1	*93.9*	9.0	*91.0*	3.8	*96.2*
Medium (30-70 percent)	9.0	*94.0*	8.2	*91.8*	4.2	*95.8*
High (>70 percent)	7.1	*92.9*	9.5	*90.5*	5.2	*94.8*
Village infrastructure index						
20 percent lowest	6.9	*93.1*	9.3	*90.7*	5.0	*95.0*
60 percent medium	6.8	*93.2*	9.4	*90.6*	4.6	*95.4*
20 percent high	5.5	*94.5*	7.5	*92.5*	4.0	*96.0*
Proportion of labor migrants						
Low (<10 percent)	6.2	*93.8*	7.9	*92.1*	4.7	*95.3*
Medium (10-20 percent)	6.0	*94.0*	8.5	*91.5*	4.1	*95.9*
High (>20 percent)	7.9	*92.1*	10.4	*89.6*	5.6	*94.4*

Table B: Percentage distribution of household characteristics by migration status in KDSS

Household characteristics	Migrants	Non-migrants	Overall
Household size			
1-2 persons	4.2	10.4	**10.0**
3-4 persons	33.6	45.6	**44.8**
5-6 persons	36.9	29.4	**29.9**
7+ persons	25.3	14.6	**15.3**
Number of labor in household			
1 person	7.0	11.3	**11.0**
2 persons	28.7	45.4	**44.3**
3 persons	28.6	23.5	**23.8**
4+ persons	35.7	19.8	**20.9**
Type of house			
Single house	90.5	88.1	**88.3**
Twin house	1.5	1.9	**1.8**
Block/shop house	7.4	9.1	**9.0**
Others	0.6	0.9	**0.9**
Type of roof			
Tile	43.0	48.9	**48.5**
Zinc plate	45.5	38.3	**38.8**
Lamparata cylindrica/elephant grass/nipa palm leaf/teak leaf	9.7	9.4	**9.5**
Others	1.8	3.6	**3.2**
Type of wall			
Concrete/brick/stone	43.9	47.1	**46.9**
Bamboo	19.1	17.8	**17.9**
Wood	26.0	25.8	**25.8**
Half cement and wood	5.3	5.9	**5.9**
Others	5.7	3.4	**3.5**
Total	**100**	**100**	**100**