



***Labour out migration on rice farming households  
and gender roles: synthesis of findings in Thailand,  
the Philippines and Vietnam***

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**Abstract**

This research described the migration trends in three case study countries in Thailand, Philippines and Vietnam with regards to the effect on household labor allocation, agricultural outcomes and the use of remittances. Rapid rural appraisal (RRA), focus group discussions and surveys of farm households with and without migrants were conducted. The main objective of the paper is to draw correlations across migration and farming outcomes to then derive policy recommendations for action. Our findings reveal that remittances help ensure food security, reduce poverty, provide more children's education, ease credit constraints in farming, pay for farm inputs and repay debts. Principal females in northeast Thailand continue to contribute significantly as unpaid field workers in rice cultivation. In Vietnam, particularly in the North, a higher proportion of principal females are left behind and take over traditional male tasks such as irrigating the fields, spraying chemicals, and hauling and marketing of farm products. In the Philippines, principal females' field activities drastically declined. However, their responsibilities in managing their farms increased. In case of principal male migration, the pressure of maintaining and increasing rice productivity falls on the principal females and other family members left behind. Their lack of access to technologies and technical knowledge were addressed by demonstrating technologies which can improve rice production, increase efficiency of inputs, reduce the use of expensive inputs to increase rice profitability. Participatory experiments, training programs and exposure visits enhanced women's technical knowledge and skills. To reduce gender inequalities in access to resources, collaborative research projects are going on between the International Rice Research Institute (IRRI) and National Agricultural Research and Extension Systems (NARES), and with non-government organizations in rice producing countries. Through participatory approaches, men and women validate technologies (stress tolerant varieties and associated crop and management practices) on their own fields using their level of management.

**Key words:** rural outmigration, rice productivity, livelihoods, remittances, gender roles

## 1. Introduction

Around 70 percent of the population in Southeast Asia live in the rural areas and depend on agriculture. However, the share of agriculture in GDP has declined, agricultural labor productivity growth is declining, and productivity gaps remain wide. Low product prices and high input prices have also made agriculture less attractive. The result: low growth in agriculture and lower incomes for the people dependent on it. Although agriculture, rice farming in particular, is still the largest employer, its capacity to generate new employment is falling. In East Asia, Southeast Asia and the Pacific, it now has less employment potential than industry or services (UNESCAP 2008). A slow growth rate in agriculture and a high growth rate in non-agricultural areas have essentially induced an adjustment in farm resource allocation between sectors and within agriculture. Out-migration from rural areas is now increasingly becoming an important livelihood strategy and escape out of poverty. Migration is a safety net against income shortfall due to crop failure or low productivity created by drought or floods. Aside from deteriorating employment opportunities at home and better prospects in urban areas, the increased mobility of the population from the rural areas is due to improved communication and road networks (Deshingkar and Anderson 2004).

Policymakers are often concerned that outmigration of labor from agriculture might reduce crop production and endanger food security. On the other hand, remittances may facilitate on-farm investment or relieve credit constraints that impeded farmers from buying fertilizer or other key inputs. The unresolved question concerning migration and agricultural production is whether remittance incomes enhance production enough to compensate for the reduced availability of male or female labor in any specific setting and improve intrahousehold welfare (better education of children, reduction in women's workload, empowerment of women, etc.). Although there have been numerous studies on migration, what has not received much attention is how this process affects families and their members left behind, especially the women. According to Hugo (1993), migration has potentially far-reaching effects on household structure by increasing the incidence of female-headed households through sex-selectivity of migration. When farms are not efficient and cannot compete, then one of the recourses of members of farming households is to increase their participation in off-farm and nonfarm activities which are less risky than farming particularly rainfed farming. Migration frequently involves moving to another area of the country or another country on a long-term or short-term basis (seasonal or circular).

It is now well documented that poor rural women in Asia play crucial roles in agriculture as food producers and income earners (IRRI 1985). However, they are not culturally perceived as farmers and they face several constraints such as gender discrimination in access to land, productive resources, support services, technologies, extension services and lack of control over these resources even in areas where they have sphere of influence based on their traditional roles. Such barriers could lead to untapped women's potential to increase productivity, ensure food security and contribute to economic development. Poor understanding of their roles as unpaid family workers and as hired laborers may result to adverse effects of technological changes on their employment and income. Although there has been much talk on the "feminization" of agriculture and increasing female-managed farms because of increasing male migration and participation in nonfarm work, data that support this contention are patchy and anecdotal. The reduction in the supply of male family labor because of participation in nonfarm work and migration will

have repercussions on the management of the farming systems, rice production and intrahousehold welfare, particularly on women's roles and responsibilities. There are knowledge gaps in relation to the effects of migration on productivity and on gender roles. There is a need to anticipate the likely implications of this trend and to prioritize research and policy interventions that can improve the well-being of members of farming households, especially of women farmers who are left to manage the farms.

In this paper, we are especially concerned with improving the understanding of migration's contribution to the livelihoods of rice farming households and its effects on women left behind to manage farms.

The specific objectives of this research are to:

- 1) Describe the outmigration trends in major rice-based farming systems in Vietnam, Thailand, the Philippines;
- 2) Assess the contributions of migration and remittances on household income, agricultural productivity, household labor allocation and family welfare;
- 3) Examine the key constraints faced by principal females in managing farms;
- 4) Identify training needs and technology solutions to overcome these constraints; and
- 5) Recommend gender-responsive policies and women-friendly rice-related technologies which can provide rural livelihood opportunities and empower poor rural women

This paper is divided into several sections. Section one presents the on-going debate on the outcomes of migration and remittances on productivity and family welfare. Section two discusses the methodology for achieving the objectives. This is followed by section three which presents the findings of this study. Section four identifies the constraints faced by the women left behind to manage farms and the strategies to enhance women's technical knowledge and skills and improve their livelihoods. Section 5 presents the conclusions and Section 6 provides recommendations for gender-responsive policies and women-friendly technologies for rice-based farming systems.

## **2. Methodology**

To address the above-mentioned objectives, this project had several phases. First a review of literature on rural migration was conducted separately in Thailand, Vietnam and the Philippines. This was followed by collection of information from secondary sources. Village rapid rural appraisals, census of the villages and focus group discussions were conducted to determine the incidence of migration and collect other migration information. Extensive surveys of farming households (with and without migrants) were conducted to assess the outcomes of migration on household income, farming households and family welfare. In this study, migration is defined as the move or change in residence of an individual (rather than an entire family) for a continuous 3 months or longer. The individual works in another

location to earn income and remit a portion of his/her income to the family left behind in the village. Three months correspond to the minimum number of months in rice farming after crop establishment. During the peak months (harvest and post harvest) migrants return to help in farm work. Other labor movement within a village and other villages for employment on a daily, weekly, or monthly basis was classified as nonfarm activity. In addition, only the current migration status of the households during the research period was considered, hence the effect of migration among rice farming households was analyzed using a cross sectional data or information.

*Selection of study sites.* The study sites were selected based on consultations with national and local government agencies (Figure 1). The criteria used in site selection were: rice is the main crop during the wet season, should represent irrigated and rainfed rice production systems and where migration occurs (Appendix Table 1). In northeast Thailand, villages in Khon Kaen and Udonthani which represent rainfed and irrigated rice production systems were selected. The study sites selected in the Philippines were Pangasinan, Bulacan, Camarines Sur and Albay, which are located in Luzon Island. The first two provinces represent the rainfed sites while the other two are the irrigated sites. In Vietnam, the study was conducted in villages located in selected provinces in the north and south Vietnam. Vinh Phuc province in Me Linh district is located in North Vietnam while Tien Giang, Long An and Ben Tre provinces of the Mekong Delta are located in South Vietnam. Except for north Vietnam which represents irrigated areas only, selected villages in South have both rainfed and irrigated rice production systems.



Figure 1. Research sites in Thailand, Vietnam and the Philippines

All the study villages grow rice during the wet season. Farmers who have access to irrigation facilities grow two to three crops of rice in a year. In Vietnam, a third crop of rice can be grown. Vietnam has the highest rice cropping intensity index but has the lowest rice area (less than one hectare). The average rice area is less than 2 hectares in Thailand and the Philippines. A household has about 5 to 6 family members. Other non-rice crops are grown during the dry season, depending upon the availability of residual moisture or limited irrigation.

*Data collection.* Village Rapid Rural Appraisals (RRAs) and census were conducted to determine the incidence of individual migration. To facilitate the data collection from target samples, guide questions were translated into local language. Data collectors were trained by the research teams in each country. The number of sample villages included in the RRA and number of households included in the census are shown in **Table 1**. Village-level information included the characteristics of the village, typologies of households (social differentiation), agriculture-related information, proximity to a labor market, occurrence and nature of participation of family members in farm, off-farm, and nonfarm work, and other migration-related information.

**Table 1. Sample villages and number of farming households covered, Thailand, Vietnam and the Philippines**

Ecosystem	Thailand	Vietnam	The Philippines
Rainfed	21	7	19
Irrigated	27	35	27
Total no. of villages	48	42	46
Households covered	6,162	3,130	5,913
Rainfed	3,030	462	3,062
Irrigated	3,132	2,668	2,851

*Source of data: Rapid rural appraisal and census of farming households, 2004.*

Focus Group Discussions (FGDs) with key informants were conducted to elicit perceptions on migration and its consequences on agriculture and family welfare. From this large population, farming households were selected through proportionate sampling according to the number of households in a village. A structured pre-tested questionnaire was used for the household surveys. Households with and without migrants among a total of 830, 813, and 831 farming households in Thailand, the Philippines, and Vietnam, respectively were included in the surveys (Table 2).

**Table 2. Number of households interviewed, sample households.**

Ecosystem	Thailand		The Philippines		Vietnam	
	WM	NM	WM	NM	WM	NM
Rainfed	175	212	206	206	117	107
Irrigated	240	203	200	201	269	338
Total no. of households	415	415	406	407	386	445

*Source: Surveys of farming households, 2005.*

*Household surveys.* The questionnaire contained two parts: Part 1 included farm-household information such as socioeconomic characteristics of the household members (type of household by kinship, age, level of education, sex, relationship to head, marital status, years in farming, major occupation, whether a migrant or not), migration-related information (number of years migrating, frequency of visits to place of origin, number of days migrant stays at home, reasons for migrating, frequency and means of communicating with families left behind, who migrates, pre-migration work and occupation of migrant in place of destination, source of information and financial support of migrant), perceptions on the consequences of outmigration on crop production and livestock, amount of remittances received from male and female migrants, disbursement of remittances from short-term and long-term migrant, sources of household income (sales from crops, livestock, rents, off-farm and nonfarm employment, remittances from migrants, others), amount and value of assets (house, land, livestock, durable goods), and land ownership. Part 2 included agricultural information (size of landholdings/cultivated land, land use, area and yield of rice by season and type of production system), and inputs and outputs on the most important parcel of rice land (labor use by gender in major rice operations, by source of labor-family, exchange, hire of adult males and adult females). Descriptive analysis was conducted by comparing and analyzing differences between households with male migrants and without migrants by duration (short term migration refer to 3 months to 6 months away from home, and long term migration refers to more than 6 months away from residence), by place of destination (internal and international), and by production system (rainfed and irrigated).

*Identification of constraints of women left behind.* Principal females of farming households with migrants were interviewed to identify the constraints they faced in managing their farms. To overcome these constraints, technology and training needs were listed and prioritized for implementation.

*Measuring women's empowerment.* In the traditional nuclear households in Southeast Asia, the male head is culturally perceived as the breadwinner and head of the household who makes decisions while the wife is mainly responsible for domestic chores, child care and works as unpaid or paid labor in other farms for additional income. We hypothesized that the absence of the principal male will result to the empowerment of the principal female. We developed a woman's empowerment index (WEI) to measure the decision-making authority of principal female/wife depending on the presence or absence of husband. The scores assigned were: 1 - husband only; 2 - husband greater than wife; 3 - husband and wife jointly; 4 - if wife dominates than husband and 5 - if wife makes decision even if the husband is present or decision is done by wife only. Thus, a wife who gets a score of 5 is most empowered. WEIs for agriculture and nonagriculture were derived. Topics on agriculture included decisions on choice of crop (what type of crops to grow, what varieties of rice to grow), crop management (when to apply fertilizer, how much fertilizer to apply, when to apply pesticides, how much pesticide should be applied, when to irrigate fields, when to weed, when to hire labor to do certain jobs, when to harvest rice, when to do rice threshing), postharvest operations (selecting crop types and seed for the next growing season, how much rice should be stored, when to sell rice and other crops); and livestock/poultry rearing (how many animals should be raised, when to sell animals). Nonagriculture includes decisions related to investments (amount of money to buy production inputs, food, equipment; whether or not to buy animals, purchase land; children's education; house construction; managing remittances) and politics (deciding for whom to vote). The means of

WEIs in agriculture and non-agriculture of households with and without migrants were compared and significant differences were tested.

### 3. Findings

To some extent, the ‘pull and push factors’ approach to find the cause of rural-to-urban migration is a combination of neoclassical and Todaro’s approaches (Todaro 1969). Lee (1966) develops a ‘general schema into which a variety of spatial movements can be placed’ based on the argument in which he divided the forces influencing migrant perceptions into ‘push’ and ‘pull’ factors. According to Lee (1966:51), the ‘push factors’ could be more important than the ‘pull factor’, which the difficulties in rural areas, such as poverty, unemployment, land shortages, low productivity, poor infrastructure and higher education facilities are driving forces that urge members of farming households to leave their native places to find a new place to settle and to work. These push factors are basic factors which lead to migration. The ‘pull factors’ include job or income opportunities outside the farmers’ village that are so attractive that people cannot stay where they are. By these means, the job and income opportunities in urban areas or advanced sectors attract the people to the urban areas to settle and to work. Social networks are of crucial significance in the migration process (Afsar 2000).

#### 3.1 Incidence of migration

We hypothesize that more people from rainfed villages migrate to other areas due to several ‘push’ factors such as higher risks in crop production, unemployment resulting from low cropping intensity and low productivity aside from poor infrastructure facilities. Results show that migration occurs in both rainfed and irrigated ecosystems but it is more prevalent in the rainfed villages. The incidence of migration is higher in northeast Thailand than in the Philippines and Vietnam. In Thailand, 63 percent and 54 percent of the households from the rainfed and irrigated villages, respectively, have at least one migrant. In the Philippines and Vietnam, about a quarter of the households have one or more migrants. The factors that have impacts on migration in Vietnam are population and employment pressure, industrialization and urbanization. However, industrialization and urbanization have not only taken place in the big cities; this process has also occurred in many other different localities. In Thailand, riskiness in farming due to unreliable rainfall distribution, drought, unemployment and poverty are factors which push the members of the farming population to the cities and other rural areas. In the Philippines, education, social networks are some of the ‘pull factors’ while unemployment, low wages, low profitability in farming, lack of infrastructure facilities in the rural areas are some of the reasons why people leave their villages for greener pastures. The interest to leave the country is not only limited to the old but among children who wished to work abroad someday (Asis, 2006).

Our findings also reveal that the rate of male migration is higher in the rainfed than in the irrigated villages in Thailand and in the Philippines but not in Vietnam. Female migration rates are higher in the rainfed than in the irrigated villages. This finding indicates that women play crucial roles in poverty alleviation of their families left behind. Across countries, the prevalence of female migration is higher in the Philippines than in Thailand and lowest in Vietnam (Table 3).

**Table 3. Incidence of migration**

Rates of outmigration	Thailand		The Philippines		Vietnam	
	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated
% of households with migrants	63	54	26	22	24	20
% of adult male migrants	34	26	20	22	25	34
% of adult female migrants	23	20	34	21	13	5
Total households	1,197	789	3,062	2,861	462	2,668
Total adult males	2,433	1,546	728	1,361	1,039	5,394
Total adult females	2,467	1,637	754	1,433	1,047	5,486

Source of data: rapid rural appraisal and census of farming households, 2004.

Household migration rate (HMR) = number of farming households with at least one adult migrant divided by the total number of farming households in the area (sample size).

Male migration prevalence rate (MMR) = number of adult male migrants in the area (sample) divided by the total number of adult males in the area (sample).

Female migration prevalence rate (FMR) = number of female migrants in the area (sample) divided by the total number of adult females in the area (sample).

### 3.2 Migration patterns

**3.2.1 Who migrates?** The impact of migration on agricultural productivity and family welfare mainly depends on two factors: a) characteristics of the migrant (sex, age, education, position in the family (principal male/head or principal female/head, adult son or daughter); b) duration of absence (whether it is short-term or long-term). For example, if the principal male is away for longer periods, the principal female becomes the *de facto* head of the nuclear household. If the able-bodied sons migrate and the elderly parents are left behind, then there is need to hire more laborers to fulfill the labor requirement of crop production on time.

Based on these results, in Thailand and the Philippines, a higher proportion of adult sons and daughters migrated than principal males of households. In South Vietnam, a higher proportion of the migrants from the rainfed villages were sons and daughters. In the north, a higher proportion of principal males than sons migrated to urban and rural areas than principal females (Table 4a, 4b, 4c). Hence, in Thailand and the Philippines the elderly principal males and principal females left behind continue their traditional roles in farm activities. This is in contrast in North Vietnam, where more men migrate while the women are left behind to manage their farms, aside from their household and child care responsibilities.

**Table 4a. Proportion of migrants, northeast Thailand**

Household member	Rainfed		Irrigated	
	Migrants	Left behind	Migrants	Left behind
Principal male	4	18	4	17
Principal female		23		23
Son	40	13	41	12
Daughter	39	12	32	15
Other males	12	17	16	19
Other females	5	17	7	14
Total	100	100	100	100
Total no. of household members	289	743	409	987

**Table 4b. Percentage distribution of family members among households who migrate and who are left behind, Vietnam**

Household member	South				North	
	Rainfed		Irrigated		Irrigated	
	Migrants	Left behind	Migrants	Left behind	Migrants	Left behind
Principal male	9	21	24	16	49	10
Principal female		29	2	26		34
Son	39	25	37	29	43	15
Daughter	46	15	33	16	4	15
Other males	2	2	2	2	3	4
Other females	4	8	2	11	1	22
Total	100	100	100	100	100	100
Total no. of household members	182	407	169	451	195	433

**Table 4c. Proportion of migrants, the Philippines**

Household member	Rainfed		Irrigated	
	Migrants	Left behind	Migrants	Left behind
Principal male	8	16	3	17
Principal female	9	18	4	17
Son	30	23	42	26
Daughter	44	24	46	21
Other males	6	9	4	9
Other females	3	10	1	10
Total	100	100	100	100
Total no. of household members	264	989	289	1044

### 3.2.2 Destination of migrants

The migration pattern based on the place of destination depends on the availability of jobs in the place of destination. As shown in Table 5, a higher proportion of the migrants are engaged in rural to urban migration than rural to rural migration. In contrast, international migration is most prevalent in the Philippines, particularly migrants from the rainfed villages. In Vietnam, rural to urban migration is more prevalent among farming households from the rainfed villages. In contrast, in the irrigated villages, an almost equal proportion of the migrants work in the rural and urban areas. International migration in Vietnam is nil. In Vietnam, temporary migration for laborers, traders and carpenters from rural areas to urban areas such as Ha Giang and Hanoi has increased perceptibly (Government of Vietnam, 2003 cited in Deshingkar and Grimm 2005). There is also much rural to rural migration from low agricultural productivity areas to high productivity areas due to new opportunities in agriculture. This continues to be an important pull due to the marked wage difference; for instance there is much rural to rural migration between lowland and upland Vietnam. Workers go from the densely populated Red River Delta in the North, to the Central Highland frontier which had until very recently a growing export oriented agro-economy primarily in coffee (Winkels, 2004 cited in Deshingkar and Grimm 2005).

**Table 5. Patterns of migration**

Patterns of migration	Thailand		Vietnam		The Philippines	
	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated
Rural to rural	28	28	16	54	10	14
Rural to urban	63	57	83	45	13	39
International	9	15	1	1	77	47
Total	100	100	100	100	100	100

With high population densities and with agriculture rapidly reaching its capacity to absorb labor, the development of nonfarm employment is a pressing challenge for most provinces in the region. Recent data show that, indeed, the dramatic reduction in poverty in the Red River Delta is mainly the result of increasing opportunities in the nonagricultural sector. Participatory poverty assessments also show that unskilled jobs, often in combination with farming, have contributed most to poverty reduction. A good road and transport network also allows people to seek employment in local urban centers or in Hanoi, without the need to leave their home villages permanently (Hoang Xuan Thanh et.al. 2005).

### 3.2.3 Occupation of migrants

Migrants leave their villages for better employment and income opportunities. In Thailand, almost half of the male and female migrants were engaged in farming in their villages, but only about 10% of them were hired in agricultural jobs in their new workplace. About half of them had to work in unskilled jobs at their work destinations. Slightly more than one-fourth of them worked as salespersons in stores (Table 6a).

**Table 6a. Occupation of migrants, northeast Thailand**

Occupation	Rainfed		Irrigated	
	ST	LT	ST	LT
<b>Male migrant</b>				
Agricultural workers	9	5	12	8
Government official	2			2
Unskilled jobs	58	61	58	56
Sales person in stores	23	28	25	27
Trading/business	2	4	2	5
Others	5	3	4	2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Female migrant</b>				
Agricultural workers	16	1	8	7
Government official		1	2	1
Unskilled jobs	46	53	50	54
Sales person in stores	30	37	30	29
Trading/business	4	4	5	7
Others	4	3	5	2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

*ST – short term LT- long term*

In South Vietnam, male migrants worked as hired laborers in agriculture, factory workers, construction workers and masons in cities, as hired fishermen in sea fishing, and in shrimp or squid catching in other provinces. Women worked mainly in factories, in waste trading and small trading, as hired laborers in rice farming, as sand boating workers, as domestic helpers, and as factory workers, or in other industrial areas near rural areas. It is interesting to note that in the North, female migrants work in other rural areas and factories on a short-term basis. Women in Vietnam are employed not only because their skills are in demand but because they accept jobs even with lower wages as long as they can remit their earning to their families back home (Table 6b).

**Table 6b. Occupation of migrants, Vietnam**

Occupation	South				North	
	Rainfed		Irrigated		Irrigated	
	ST	LT	ST	LT	ST	LT
Male migrant						
Farming	20	8	45	38	10	10
Factory work	29	23	27	22		6
Skill work	9	15	11	13	84	78
Off-farm work	26	35	4	6		
Government employee	6	8	3	9	2	3
Others	9	12	11	13	3	2
Total	100	100	100	100	100	100
Female migrant						
Farming	6	8	2	7	50	25
Trading	18	4	8	7		25
Off-farm work	18	34	4	7		
Housekeeper, hairdresser and barber	8	4	4	7		
Factory work	34	50	50	53	50	37
Government employee	6		15	19		
Others	10		17			13
Total	100	100	100	100	100	100

*ST- short term LT – long term*

Within the Philippines, male migrants work in factories and service sector as mechanics, carpenter, driver and other skilled jobs. A higher proportion of the male overseas contract workers also work as factory workers and service sector (airplane, ship, cargo, etc). In contrast, female international migrants worked as contract workers mainly as household helpers and caregivers in the Middle East, Italy and Singapore. Male migrants were employed in the Middle East, Korea, Taiwan and other countries as construction workers, drivers, operators of heavy equipment, or seafarers (Table 6c). The study of Quisumbing & McNiven (2005) argued that “brain drain” may not be necessarily stopped from outmigration from rural areas because if migrants are able to find better jobs in urban and periurban areas, and send remittances to their origin families, then migration is welfare-improving for those who stay behind. But they also warned that it depends on the type of occupations that the migrants engaged in. Majority of male migrants end up in manual labor, transportation work, crafts, and trade which are not high-earning occupations. Educated women, on the other hand are willing to work as care givers and domestic helpers in other countries, others work in the entertainment sector.

**Table 6c. Occupation of migrants, the Philippines**

Occupation	Rainfed		Irrigated	
	Internal	International	Internal	International
Male migrant				
Office work	26	8	11	14
Factory worker	23	31	12	7
Airplane/ship/cargo worker		18	1	52
Mechanics/carpenter/driver	32	23	33	7
Military/police/guard	3		17	2
Others	16	20	26	18
Total	100	100	100	100
Female migrant				
Office work	32	5	34	6
Hospital worker	11	15	6	18
Factory worker	32	18	16	8
House base work		41	13	45
Shops and business/sales	25	6	17	9
Restaurant/Hotel work		10	3	10
Others		6	11	4
Total	100	100	100	100

Family members from farming households prefer to migrate to other countries because of higher remuneration and benefits. For example, domestic helpers or drivers have higher salaries and better benefits if employed in other countries than in their respective countries (Appendix Table 2). All the migrants are literate and have been to school from elementary to college. International migrants are better educated (a majority are college graduates or high-school graduates) than domestic migrants. However, because of higher wages abroad, college graduates, especially women, accepted jobs, even as domestic helpers and caregivers, which are jobs in demand.

#### 4. Migration as a livelihood strategy

Every year, farmers who grow rice under rainfed conditions are faced with uncertainty and taking risks. Rainfall distribution is highly variable and unpredictable. Drought occurs during the vegetative phase of rice growth, which causes losses or low yields. This situation is exacerbated by the predominance of marginal and small size of landholdings and abject poverty. Thus farming households derive their livelihood from diverse sources of farm income (rice, non-rice, livestock, rental fees from land, animals, machine), off-farm activities and non-farm activities. Most often in income analysis, remittances are aggregated under non-farm income. However, since this research focuses on income from out migration, remittances were separated from non-farm income. Off-farm income refers to the income obtained by male or female household members from wages paid in cash or wages in kind by working as hired agricultural laborers in different farm operations in other farms. Non-farm income refers to income received by family members by working within and outside the villages without a change in residence. This includes white and blue collar employment opportunities. Earnings from retirement pension, small scale buy and sell business and services and other earnings from household members who commute daily for non-farm jobs are classified under non-farm income.

Table 7 shows the share of the different sources of livelihood and average household income. Households with migrants have higher average annual incomes than those without migrants in Thailand and the Philippines, except for Vietnam where incomes are almost the same. Remittances from migrants comprise a significant share of the total household income in the three countries. The share of remittance income is highest in the Philippines (59 percent) mainly due to international migration. In Thailand and Vietnam, remittances are 38 percent and 36 percent respectively where rural to urban migration is more prevalent brought about by rapid industrialization and transportation facilities. Remittance earnings compensate for lower income from rice in the Philippines and Thailand. These findings reveal that migration is routine livelihood strategy of poor farming households which helps to smooth seasonal income fluctuations and earn extra cash to meet contingencies or increase disposable income, particularly in the rainfed villages.

**Table 7. Share of different sources of income (%) and household income per year**

Source of income	Thailand		Vietnam		The Philippines	
	WM	NM	WM	NM	WM	NM
	(n=268)	(n=295)	(n=304)	(n=346)	(n=321)	(n=349)
Remittances from migration	38		36		59	
Cash income from rice	12	19	37	49	17	36
Cash income from other crops	16	21	2	1	a	
Off-farm	4	8	2	4	2	2
Non-farm	21	45	10	25	20	57
Capital gains from land and non-land assets	1	1	a	a		a
Sale from livestock	8	6	13	21	2	5
Total	100	100	100	100	100	100
Annual household income (USD)	2,541	1,842	1,411	1,306	2,857	1,512

WM- with migrant NM – no migrant; a - less than 1%

Rice production provides the highest share (37 and 49 percent for households with and without migrants, respectively) in Vietnam due to high rice cropping intensity brought about by irrigation facilities. For non-migrants, income from rice and non-rice crop and non-farm activities are the major sources of income. The share of income from other crops is highest in Thailand but negligible in Vietnam and the Philippines. Livestock is an important source of income particularly for households without migrants in Vietnam. These findings indicate that migration is a driver of economic growth and helps the family members left behind.

#### 4.1 Use of remittances

Migrants allocate their earnings for their personal expenditures in their workplace and send the rest to their families back home. Migrants from Thailand sent less than 50 percent of their earnings while Filipino migrants sent about half of their earnings to their families left behind. Migrants from south Vietnam sent half while those from the north sent 70 percent of their earnings (Table 8) While migrants sent remittances on a regular basis, they also save for future large expenditures. The amount of remittances sent to the families left behind depend on the remuneration received by the migrants. Migrants from the Philippines sent the highest amount (about US\$200 per month) while Thai migrants sent less than US\$100 per month.

Vietnamese migrants sent the lowest remittances at less than US\$50 per month. As mentioned earlier, international migration is prevalent in the Philippines while migrants from Thailand and Vietnam go to rural areas or to urban areas due to industrialization and improvement in transportation facilities.

**Table 8. Percentage disbursement of remittances, northeast Thailand**

Items	Thailand		The Philippines		Vietnam		
	Rainfed (n=232)	Irrigated (n=319)	Rainfed (n=207)	Irrigated (n=235)	Rainfed (n=174)	Irrigated (n=157)	Irrigated (n=194)
Food	25	24	22	16	35	24	10
Farm input	13	14	18	15	26	26	2
Education	13	8	24	25	10	10	17
Debt payments	22	21	5	3	5	4	8
House construction	7	8	5	11	2	6	14
Savings	4	8	6	9	8	14	37
Health care	3	3	6	8	6	5	3
Social obligations	2	3	1	1	8	9	7
Clothing	2	2	2	4		2	2
Household durables	7	7		1			
Others	2	2	11	7			
Total	100	100	100	100	100	100	100
Average monthly remittances sent by the migrant (US\$)	57	74	206	168	19	22	47
Percent of remittances over income from migration work	26	30	48	55	46	37	70

*Note on the percent of remittances over income from migration work: Monthly salary and monthly remittances sent by the migrant were reported by the receiving household, some household approximated the income of the migrant member but all receiving households gave the exact monthly remittances, hence the ratio of monthly remittances and monthly income is nearest approximation of the percent of remittances over income from migration work*

How are remittances used by farming households left behind? It has been widely observed that the investment of remittances into productive uses is limited and consumption spending is greater. But this is not necessarily a problem as consumption can include a variety of uses which may have a positive impact on well-being and multiplier effects in the economy. Based on this study, remittances were mainly used for food and other daily expenditures, particularly in northeast Thailand and the Philippines.

In the northeast Thailand, remittances were used for repaying debts, farm inputs and children's education. Aimimthan et al (2002) in a study in Khon Kaen province revealed that migrants had to pay high interest rate in paying off debts to recruitment companies. More children or dependents were enrolled in school than before.

In the Philippines, next to food expenditures, families left behind spent the remittances on children's education and farm inputs. For migrant parents, providing an education for the children they leave behind in the Philippines is a priority. Due to strong family ties, unmarried female migrants are expected to pay for the education of other close relatives including nephews and nieces. Migrants also take care of the health care needs of

ageing parents since public health in the Philippines particularly in the rural areas, is considered to be quite poor and the costs of medicines are too high. A study on Filipino migrants in Italy revealed that it is the investment of remittances in agricultural production that has offered greater food security for remittance-receiving households. This is due in part to the fact that remittances allow farmers to purchase the necessary inputs (fertilizers, pesticides) pay for irrigation expenses, pay for hired/ contractual laborers or purchase livestock. This permits farmers to stock the rice requirements for a year particularly those rainfed farmers who harvest only once in a year (INSTRAW 2008).

Remittances reflect the long-standing Vietnamese tradition of strong family support, and play a significant role in rural livelihoods, especially where opportunities for agricultural diversification and for nonfarm employment are limited. They help repay debts, and cover the costs of children's schooling and illness for relatives left behind. They can reduce the need for farmers to sell their paddy rice for cash, and thus strengthen rural food security. Remittances can also increase purchasing power and stimulate the local economy. In Vietnam, families in the South spent their remittances on food and farm inputs while those from the North kept the remittances as savings for future investments and less on food expenses. In general once the basic needs of the households with migrants are met, construction or renovation of a house is generally a common investment as well as purchase of consumer durable goods.

#### **4.2 Migration and rice productivity**

The performance of a crop can be attributed to the many factors such as the environment, quality of land, labor, capital and managerial ability of the farmer. Effective farm management depends on the education of the farmer, experience, technical knowledge, access to inputs, incentives and family support. Rice productivity is influenced by agronomic factors, including varieties used and associated crop and resource management practices. The effects of migration on agricultural productivity are mixed. On the one hand, migration reduces the family labor supply and can reduce farm output. Farm output can later increase if remittances are reinvested in farm inputs, hire additional farm labor to complete the labor requirements on time and also relieve drudgery especially of women or help ease credit constraints. To assess the effect of migration on rice productivity, a comparison was made between the average rice yields of households with and without migrants by production systems (rainfed and irrigated) during the wet season. Results revealed that in all the study sites in three countries, average rice yields between households with and without migrants showed slight differences. However, these differences were significant only in the irrigated but not in the rainfed sites (Table 9). In the Philippine study sites, the reduction of family labor supply is compensated by hiring more labor. In the Vietnam, particularly in the north, female family members compensated for the migration of male members. In Thailand, family members left behind provided most of the labor aside from hiring additional labor. These findings indicate that migration did not reduce rice yields because the members left behind tried to maintain rice yields at par with those households wherein the principal males and principal females are present. In all the countries, remittances were used to pay for farm inputs and hiring of labor. These findings are similar to the study of Mochebele (2000) which concluded that farms supplying migrant laborers attempt to use purchased inputs to compensate for reduced household labor and that yields and output levels do not differ appreciably across the two groups.

**Table 9. Average area and yields in the wet season by country**

Country/Area/Yield	Rainfed			Irrigated		
	WM	NM	t-test	WM	NM	t-test
<b>Thailand</b>						
Number of farmers (n)	175	212		237	203	
Area (ha.)	1.74	1.64	0.847	1.55	1.77	-2.097**
Yield (tons/ha.)	2.34	2.38	-0.384	2.50	2.67	-1.756*
<b>The The Philippines</b>						
Number of farmers (n)	206	206		198	200	
Area (ha.)	1.58	1.52	0.481	0.92	0.85	0.997
Yield (tons/ha.)	3.88	3.92	-0.298	3.72	3.48	1.691*
<b>Vietnam (South)</b>						
Number of farmers (n)	116	106		119	223	
Area (ha.)	0.69	0.66	0.352	0.71	0.61	1.124
Yield (tons/ha.)	3.59	3.86	-1.569	4.72	4.37	2.491**
<b>Vietnam (North)</b>						
Number of farmers (n)				(n=147)	(n=111)	
Area (ha.)				0.17	0.17	-0.024
Yield (tons/ha.)				4.63	4.41	1.880*

WM – With migrant; NM – No migrant; \* : significant at 10%, \*\* : significant at 5%

Note: Few farmers were not able to harvest due to pest infestation or unforeseen weather disturbances at harvest time

### 4.3 Migration and labor participation in rice production

In Thailand, the Philippines, and Vietnam, there are tasks in rice production which are exclusively done by men and women only and tasks which are shared. While men are exclusively responsible for preparing the land, broadcasting chemical fertilizer, spraying chemicals and hauling farm products, the women do most of the operations such as pulling and transplanting seedlings, weeding, and postharvest activities. Men and women share harvesting work, although more women than men are engaged in this activity. The use of machinery is the exclusive responsibility of men. In case of labor shortage, women exchange labor with other women of the same social status. Female family members are also responsible for cooking and taking food to farm workers. Principal females also visit the farm, especially in the absence of the male heads, and oversee the work of the hired laborers. In addition, principal females purchase material inputs, which are listed by the principal males or hired farm supervisor. In most cases, principal females are aware of the different kinds of chemicals applied on the farm and the varying prices of these chemicals. They have some knowledge on specific pests or diseases and the recommended brand of pesticide and dosage on rice. Their knowledge and experience in farming make them legitimate managers of farming enterprises. Principal females are mainly responsible for keeping money and they have some control of disbursement for different expenditures. Thus, in cases of limited cash, they bear the burden of finding ways to borrow and repay private money lenders or friends, look for other income-generating activities and engage different cost saving activities (Paris et al., 2004; Chi et al., 2008).

With the diminishing supply of labor for male and share farm tasks, women must either depend on hired labor (which many cannot afford) or substitute for male labor. To compare the labor inputs across migration status and production systems, we disaggregated the labor inputs of male and female members (family, exchange and hired) per hectare (Table

10). In Northeast Thailand, a higher proportion of family members contribute in rice production with females contributing a quarter of the total labor inputs. Households with migrants hire more labor than those without migrants. In the Philippines, the proportion of hired labor is higher than family labor. Female hired laborers substitute for wives' labor. These indicate that the remittances relieved female family members from drudgery in farm operations. In contrast, rice farming in North Vietnam is dominated by female family labor particularly in households with migrants. In the south, there is not much difference in the labor inputs among family members by migration status. Farms are dependent on family workers.

**Table 10. Labor inputs in rice production by country**

Type of labor	Rainfed				Irrigated			
	WM		NM		WM		NM	
	Person days/ha	%	Person days/ha	%	person days/ha	%	person days/ha	%
<b>Thailand</b>								
Family and exchange								
Male	35	39	40	45	29	37	36	45
Female	20	23	24	26	20	25	23	29
Hired								
Male	17	19	12	13	14	18	12	15
Female	17	20	14	16	16	21	10	12
Total	89	100	90	100	79	100	80	100
<b>The Philippines</b>								
Family and exchange								
Male	14	15	14	20	17	18	16	18
Female	1	1	1	2	1	1	2	2
Hired								
Male	60	68	47	64	66	71	60	69
Female	13	15	10	14	9	10	9	10
Total	88	100	73	100	93	100	86	100
<b>Vietnam (South)</b>								
Family and exchange								
Male	35	25	35	26	26	32	26	33
Female	50	36	58	43	26	32	25	31
Hired								
Male	15	11	12	9	13	16	14	17
Female	39	28	29	22	16	20	15	19
Total	139	100	134	100	82	100	80	100
<b>Vietnam (North)</b>								
Family and exchange								
Male					22	7	48	15
Female					279	88	250	78
Hired								
Male					13	4	10	3
Female					3	1	13	4
Total					317	100	321	100

#### 4.4 Migration and women’s work load

Palmer (1985) cited many issues for women left behind one of which is the increase in the work burden of men and women, depending on who is left behind. In Thailand, the absence of principal males and sons did not change women’s workload because they used remittances for hiring labor for land preparation, spraying of chemicals, and other heavy tasks. Principal females continued to perform their traditional tasks as unpaid family workers and as managers in terms of allocating a limited budget, arranging for hired laborers, and borrowing money from private lenders. Thus, migration did not change their traditional roles. In the Philippines, migration of principal males and sons reduced the field activities of principal females but increased further their managerial responsibilities. In Vietnam, particularly in the North, migration of principal males increased their workload and farm managerial responsibilities. Aside from managing all operations, they also looked for laborers to hire during peak cropping operations. If hiring of laborers is difficult, women exchange labor with other women from other households. Irrigating fields in the evening alone without a male companion was cited as a problem. The important activities that increased wives’ workload when husbands left were fertilizer application, and pesticide application. In the north, wives increased their labor inputs in land preparation and dike building. On the other hand, if principal females migrate, principal males find it difficult to change gender roles in household and child care responsibilities.

#### 4.5 Migration and women’s empowerment

Rice productivity depends on the adoption of improved varieties and crop and resource management technologies. This requires making sound and timely decisions which depend on farmers’ experience, indigenous and technical knowledge. To better understand women’s (principal females) decision-making authority on farm- and nonfarm-related matters, a woman’s empowerment index (WEI) for specific topics was developed. Results showed that WEIs are higher among households with migrants than among those without migrants in Vietnam (Table 11). Wives are compelled to make “on-the-spot” decisions when husbands are away on a long-term basis. Their roles have begun to shift from unpaid labor to managers of their own farms.

**Table 11. Average women empowerment index by area of decision making**

Sector	Thailand		Vietnam		The Philippines	
	WM (n=74)	NM (n=69)	WM (n=122)	NM (n=104)	WM (n=114)	NM (n=111)
Agriculture <sup>a</sup>	2.56	2.20	3.96	3.04	2.22	1.86
Non-agriculture <sup>b</sup>	3.93	3.83	3.70	3.29	2.99	2.88

<sup>a</sup> : There are significant differences on WEIs on agriculture concerns between households with and without migrant in all countries

<sup>b</sup> : There are significant differences on WEIs on non-agriculture between households with and without migrant in Vietnam only

#### 4.6 Personal problems of principal women left behind

Temporary labor migration usually does not allow migrants to bring family members to the country of employment. Although migration can benefit families, there are concerns about potential costs to family cohesion, marital stability and children left behind. Extended separation forces the family left behind to reshuffle an increased workload, to reallocate decision-making responsibilities and to fill the psychological emptiness generated by the absence. Extended families often fill the void and provide continuity in family based case (Asis, 2003). Cheaper and faster communication also narrowed the distance between family members. Even so, marital instability and the break-up of the family ties are often mentioned as consequences of prolonged absence (Hugo, 1993). As mothers of migrant sons, they worried about their health, accidents, job security, and money shortage/management. For the Philippines, parents worried about the fate of their daughters who work in the Middle East and other countries. Principal females whose husbands left for long periods suffered from psychological problems such as loneliness, depression, insecurity, and difficulty in disciplining their children, especially their sons. During the interviews, many female respondents broke down into tears after revealing their personal problems. These problems are similar to those poor women India who suffer from insecurity and helplessness due to male outmigration (Paris et al. 2005; Paris et al. 2008a).

#### 5. Constraints faced by women left behind in managing farms and strategies to overcome these constraints

When women were asked whether they had encountered problems in managing their farms, at first, they said they had no problems since they had long-term experience in farming. However, after gaining rapport with the women, they said that they faced much pressure to maintain rice yields. In-depth interviews with principal females from sample farming households with migrants in the Thailand, Vietnam and the Philippines revealed several constraints which women face in managing their farms (Table 12).

**Table 12. Constraints to increasing women’s productive capacity and identified opportunities**

Countries	Constraints	Identified opportunities
Thailand	High costs of inputs particularly chemical fertilizer and herbicides	Biofertilizer, golden snail control, the use of bio-insecticide
Vietnam	High costs of inputs (seeds, fertilizer and pesticides)	IPM, 3 R’s (reduce seeds, chemical fertilizer and pesticides)
The Philippines	Lack of irrigation, poor germination ability of rice seeds high costs of inputs, low paddy price	Improved seed health practices and pest management

In northeast Thailand, the wives revealed that their work burden increased. They had to manage the day-to-day farm activities and household management when husbands worked outside their villages for extended periods. They complained of high costs of fertilizer costs and herbicides to control weeds, especially in direct-seeded plots. They also had problems with snails, which damage young rice seedlings; low yields due to drought; and a reduction in

paddy area because of increasing area cultivated to other crops (sugar cane, eucalyptus, cassava). The costs of chemical fertilizer ranged from 45% to 55% of the total costs of farm inputs in this study (with and without migrants) in both irrigated and rainfed villages. In Vietnam, women took over the responsibilities and workload of men in rice operations such as water management, land preparation, dredging field canals, pest management, pest identification, pesticide spraying, fertilizer application, and hauling of paddy sacks. The women complained of a lack capital to pay for hired laborers and cash to buy material inputs since remittances were small. They also complained of high costs of inputs such as seeds, chemical fertilizer and pesticides. In the Philippines, lack irrigation (rainfed farms), high costs of fuel (irrigated farms), poor germination ability of rice seeds bought from the market and from farmer exchange, lack of machinery, for example, a tractor for land preparation, high costs of inputs (chemicals, hired labor, costs of irrigation) and a low paddy price, which makes rice production no longer profitable are the constraints they face in rice production and constraints in adoption of new technologies.

### **5.1 Enhancing women's technical knowledge and skills**

Several knowledge-intensive technologies require knowledge and skills. Thus the respective research team with the required expertise in each country organized several training programs with both men and women who belong to the households with migrants. In the Philippines, farmers use seeds for the next season from their saved seeds and through farmer-to-farmer exchange. Farmers replace seeds or buy new seeds after 2–3 years. Because of this practice, seeds lose their purity and vigour. Thus a series of village classes were conducted on “Improving farmers’ rice seed health practices”. Extension guides on “Improved Seed Health Improvement Practices” (SHIP) were distributed to the agricultural extension officers and participants. The topics covered different methods of seed cleaning, field seed health selection processes at harvesting, drying, and storage, pests and diseases of rice plants and use of the leaf color chart to guide farmers on proper time to apply chemical fertilizer thus reducing the costs.. After the training, farmers compared the selected (healthy) seeds with the unselected seeds in their own plots. This gain in knowledge led to yield gains of 5 to 10%.

In Vietnam, the research team organized a series of training programs at the three study sites on the onset of the wet season. Inviting women in agriculture related training courses is something new because women were never invited before by the agricultural extension office located in the villages. Each female participant received a personal invitation. Women received technical knowledge on integrated pest management (IPM), the 3 Rs (reduce seeds, fertilizer, and pesticides), and seeds of new varieties. At the rainfed sites, the women used to grow long-duration rice varieties however, after the training, they shifted to short-duration varieties (3 months) such as C10 and F1. They also reduced the number of insecticide sprays, amount of fertilizer and seeds. They were able to save 350,000 to 400,000 dong/ha (US\$22–25) due to the reduction in the cost of inputs. Average yields increased from 4 to 5 tons/ha. In the irrigated villages, the women are already growing short-duration varieties. However, after the training, they reduced the amount of urea, increased the dosage of potassium, reduced the number of insecticide sprays and seed rates. Yields increased during the wet season.

In Thailand, the team organized field trips and training courses on technologies which can reduce the cost of chemicals such as fertilizer and herbicides. Staff from the Land Development Department and experts from the Faculty of Agriculture, Khon Kaen University trained the women and their husbands as well as village committee members on the production and application of liquid bio-fertilizer and bio-insect repellent using local herbal plants to control weeds in the fields. Other income-generating activities were also introduced such as basket making using local materials.

Aside from these activities, there are on-going collaborative research activities between the International Rice Research Institute (IRRI) and national agricultural research and extension systems in Thailand, Vietnam and the Philippines. These research activities include the development, validation and dissemination of improved rice varieties which are tolerant to stresses such as drought, submergence and salinity. The stress-tolerant lines are tested on farmers' fields through participatory varietal selection with both men and women as participants (Kumar et.al. 2008; Ismail et al. 2008; Paris et al. 2008b; Paris et al. 2008b). Other potential income generating opportunities which were validated by women were the portable rice mill and rice portable rice flour mill in the Philippines and Bangladesh (Diaz et al. 1999; Paris, et.al, 2008; Paris et al. 2001), plastic row seeder in Vietnam (Paris and Chi, 2005) and mushroom and mushroom spawn production in India (Islam et al.2007). These demonstrated potential sources of income for poor rural women.

## 6. Conclusions

These findings established that male labor outmigration is predominantly high and will continue to increase as long as there are economic incentives to move and as long as the operation of agricultural land is no longer the predominant source of income. However despite migration, lands are not abandoned and family members maintain close ties with those left behind. Farming will still be the mainstay in rural areas. Farming households will continue to supply labor to urban and industrialized areas, which have more regular employment opportunities and higher compensation. Those family members who have higher opportunity costs tend to migrate and the elderly, uneducated are left behind to manage the farm. Remittances help provide food security, reduce poverty, provide more education for the children, and ease credit constraints in farming, pay for farm inputs (hired labor, material inputs) and repay debts. Except in the Philippines where the participation of principal females in rice production declined, in Thailand and Vietnam, principal females continue to contribute significantly in rice cultivation. The pressure of maintaining and increasing rice productivity falls on the family members left behind, women in particular, thus increasing their work burden and managerial responsibilities. Thus, enhancing their skills and knowledge as well as providing them with new agricultural technologies will help them increase rice productivity, ensure family food security, and alleviate poverty.

## 7. Recommended policies and programs

To reduce gender inequality and provide rural employment, following needs to be addressed:

- a) Stereotypical notions that rural women are mere housewives should be discarded and replaced by recognition that their roles in production and their contributions to family income are crucial for improving household livelihoods.
- b) Policies/interventions should suit the needs of women from different socioeconomic groups especially the *de facto* and *de jure* female heads of households.
- c) International and national agricultural research and extension systems should include both men and women farmers in participatory research on rice varietal improvement and associated crop and resource management technologies for stress prone environments
- d) Government and NGO programs should involve poor women in new programs that encourage efficient use of inputs and expenditure savings such as IPM, the 3 Rs (less seed, less fertilizer, less pesticides), use of bio-fertilizers, practices to improve seed health, vaccination of livestock and poultry, and production and marketing of products
- e) Knowledge is power,” but this has to be shared with women and not only with men. Women should be provided with technical knowledge and skills on crop management in production such as raising seedlings, how to identify pests and diseases, knowing the timely use of fertilizer and recommended amounts, etc.
- f) Provide men and women with opportunities for technical education that can build their entrepreneurial skills for self-employment and wage employment
- g) Programs that combine technical with organizational and leadership skills are effective in building social capital. Thus, research and development workers should facilitate the formation of women’s groups to sustain adoption of different income-generating activities. One strategy would be to train rural women as female agricultural extension workers at the local level who can transfer their knowledge to other women.
- h) Need crop diversification and markets to provide rural employment of men and women

**Appendix Table 1. Rice production statistics by country**

Country/Provinces	Area planted to rice (ha)	Yield (tons/ha)	Source of water (% distribution)	
			Irrigation	Rainfed
Thailand	10,650,400	2.68	26.00	74.00
Khon Kaen	400,232	1.95	14.80	85.20
Udonthani	305,583	1.81	25.00	75.00
Vietnam	7,445,300	4.86	80.00	20.00
Vinh Phuc	72,900	5.00	100.00	-
Tien Giang	259,400	5.07	99.42	0.58
Long An	433,400	4.39	80.82	19.18
Ben Tre	90,500	4.07	85.72	14.28
The Philippines	2,393,283	3.58	68.00	32.00
Pangasinan	173,393	3.66	57.64	42.36
Bulacan	44,703	4.08	55.15	44.85
Camarines Sur	74,842	3.52	69.59	30.41
Albay	27,894	3.28	77.01	22.99

Sources:

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<http://www.gsid.nagoya-u.ac.jp/sotsubo>
- Vietnam: Statistical Year Book 2005 by Statistical Publishing House, Ha Noi, 2006; extension center of the provinces
- The Philippines: NSO QuickStat Online Census, National Statistics Office (2000) and Agricultural Statistics Online, Bureau of Agricultural Statistics (2000); PhilRice-BAS Rice Statistics

**Appendix Table 2. Average salary by the common occupation of the migrants and by migration classification (in Peso/month), the Philippines**

Occupation by migrants	Irrigated		Rainfed	
	Internal	International	Internal	International
Male migrant				
Office work	8,625	38,000	6,350	23,333
Factory worker	6,625	25,538	7,971	20,000
Airplane/Ship/Cargo worker		41,857	7,000	27,307
Mechanics/carpenter/driver	7,414	15,495	7,574	38,333
Female migrant				
Office work	17,667	20,000	11,589	31,000
Hospital worker	27,500	32,000	6,000	20,975
Factory worker	6,969	22,556	5,422	37,500
House base work		23,843	3,750	20,569
Shops and business/sales	7,000	40,000	4,480	18,667

<sup>a</sup>: internal/international \* 100, e.g. salary of an internal male migrant as office worker is 23% to 27% of the salary of an international male migrant

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