Migration, Remittance and Food Security: a complex relationship
(Study of small village in Kalikot district, Nepal)

Abstract:
A Household study was carried out in a small village located in the Karnali Zone of Nepal, with the intention to investigate the outcome of migration on household farm production and its subsequent effect on household level food security. Based on the survey report, the impact of migration on these two variables is rather complex. On one hand, the results illustrate a negative impact of migration on household farm production through a decrease in the numbers of the most productive male labor members and through an increase in female participation in the agricultural work force. On the other hand, even though emigration is negatively affecting farm production, remittances are helping households to reduce the problem of food insecurity to a certain extent but in the case of lower caste households remittances are not sufficient to overcome the problem of food insecurity. Therefore the probability of finding migrants is higher among the lower caste population. Although, the outcome is complex, the results as a whole are quite encouraging and statistically significant.

Key words: Migration, Household, Remittance, Agriculture Production, Food Security, Food Insecurity, Labor.
1) **Introduction:**

Nepal is one of the least developed countries in the world, predominated by agriculture as a major source income and employment, about 65 percent of population primarily dependent on agriculture for their livelihood. As the agricultural sector is the dominant provider of income and employment, the current rate of population growth and increase in labor force participation not only creating pressure on agriculture land, but also affecting the capacity of household to carry out sustainable and sufficient agriculture production activities. To add to that, the performance of agriculture land itself not satisfactory nor sufficient enough to fulfill the consumption need of rural household; more often agricultural productions are affected by unreliable weather, difficult terrain, insufficient transportation network, limited irrigation facilities, lack of inputs, and so on. Consequently, most Nepali rural agricultural households are increasingly depending on non-farming activities in order to overcome the consumption gap that occurs due to the poor condition of the agricultural sector.

In Nepal, farming provides output barely sufficient for the survival of the rural population, i.e. it is subsistent in nature, and thus most of the households are involved in a range of rural non-farming employment activities. Similarly, in order to overcome consumption deficiencies, poor households follow either one or more of various alternatives such as agricultural expansion, diversification into non-agricultural sources of income, emigration for seasonal employment opportunities and so on. Effectively, these activities assist rural households to minimize the gap between production and consumption, thereby continually encouraging agricultural production.

Essentially, the strategies used to maintain livelihoods in rural-agricultural Nepal perhaps categorized into three main divisions - subsistence agriculture, diversification of livelihoods via non-farming activities and seasonal or permanent migration. In the presence of excessive population pressure on agricultural lands, rural agricultural households are left with the option of either increasing farm productivity or to generate non-farming income to fulfill basic household consumption needs. Given the productivity constraint in the agricultural sector, households are compelled to search for alternative non-farming employment opportunities. Furthermore, in the absence of domestically available non-farming employment opportunities, household members are only left with the option of searching for employment opportunities outside the rural sector; more often than not they choose to emigrate from the country. Therefore, for the past two decades, emigration has become an essential household strategy to bridge the production deficiency of the agricultural sector. This is also evident from the growing labor drain in Nepal, the number of emigrants from Nepal has significantly increased in last two decades; at present the percentage of migrant population (both immigrants and emigrants) in Nepal is 36.9 percent (CBS 2010/11).
In Nepal, most of the migrant population originates from the rural agricultural sector and the subsequent effects on the agricultural sector remain unnoticed and unexplored. Moreover, whilst the importance of migration to rural households cannot be ridiculed, the actual long term impact of continuous emigration on the agricultural sector is very much debatable. For ages, migration has not only been assumed to be a livelihood strategy for rural population but also an important measure of macroeconomic stability of the economy. So far policy makers have only focused on the remittance generated by emigrants, because remittances in terms of foreign currency make the balance of payments situation of a country better and stable (Pant, Raut, Pandey 2011). In addition, the impacts of remittance on the economy are visible through various channels such as savings, investments, growth, increased consumption, poverty reduction and income redistribution. Along these lines, remittance is affecting the GDP positively by lowering the probability of current account deficit (Pant 2008).

Ideally, economic policies are structured on the premise that remittance sent back home will transform into economic development through the means of extra savings, capital formations and increase in demand of domestically produced goods. Thus, ideally, in the long run it is believed to create employment opportunities within the economy. Nevertheless, contrary to above argument, in Nepal, only two percent of remittances are used for capital formation (CBS 2010/11) and instead of generating demand for domestically produced goods; remittances are leading to more consumption-led imports. According to the CBS 2003-04, 15 percent of the total economically active male population in the country was engaged in migration. Plus, the inflow of remittance has increased from USD 1.1 billion in 2000 to USD 1.6 billion in 2007 (World bank 2008) but the actual amount is still much higher than reported. Similarly, at present remittances account for 23 percent of the Gross Domestic Product of Nepal.

Although we must acknowledge the positive impacts of migration on macroeconomic indicators and the livelihoods of rural population, it is also imperative to recognize the long term consequences on the rural agricultural sector.

1.1) General Problem

Historically migration has been an important source of livelihood for the Nepali population, helping to minimize the consumption gap and to improve living standards. In other words, agriculture has been the sole breadwinner for rural households; the role of emigration has been recognized as - a catalyst to overcome consumption deficiencies in the event of low agricultural production, a generator of agricultural investment to improve productivity, a mean to pay back debts, a safeguard against unanticipated events etc. In addition, migration plays significant roles in changing agricultural practices and production means in the rural economy. It strangulates traditional agricultural systems,
which are dominated by the male work force to one which is dominated by females, resulting in a fall in agricultural production. The effects of migration are not limited to agriculture; it has a wide range of impacts starting from the micro economic household level to the macroeconomic level. But the issue of migration has hardly received any significant acknowledgment from the Government of Nepal in its policies, in spite of a decade long growth pattern seen in emigration levels. Even researchers, policy makers and other intellectuals have paid little heed to analyze the inter-linkages between the decade long emigrational pattern and its impact on the rural agricultural sector.

Most mainstream literatures have hypothesized that international migration and remittance reduces poverty via its direct effect on poor households, because remittance goes directly to the hands of the poor. In fact, in Nepal, the Nepal Living Standard Survey (NLSS) 2004 first acclaimed the role of remittance in poverty reduction. According to the CBS report (2004), poverty declined from 42 percent in 1995/96 to 31 percent in 2003/04, work related migration and inflow of remittances were attributed to be the major reasons behind it. Similarly, one study concluded that international migration and remittances serve to reduce the severity of poverty in poor countries claiming that; a 10 percent increase in size of international migration, leads to a 2 percent fall in the number of individuals living on less than $ 1.00 per day (Adam Jr. Richard and Page John 2005).

Perhaps households who receive remittance have a multiplier income effect via their expenditure on the development of a region. It creates some off-farm employment within the country through consumption expenditures on locally produced consumption goods, and also has a multiplying effect on the income of non-migrants (Pant, Raut, Pandey 2011). Ratha (2003) concluded his study by stating that remittances not only raise the level of household welfare in developing countries but also have an income multiplying effect, because remittances are mostly spent on the locally produced consumption goods.

Although there are several claims in favor of migration, its consequences on domestic agriculture are still to be analyzed properly. There are some evidences that suggest certain negative impacts of migration on agricultural production. Emigration and loss of labor are directly related, emigration of a family member results in a fall in family labor supply, thereby affecting the agricultural production of a migrant household, if the household is reluctant to use hired labor. One such study in Nepal shows that migration leads to a fall in gross agricultural output; an emigrating laborer results in a loss in gross agricultural production by NPR. 18,000. A recent study conducted by Amina (2010) in the Syangja District of Nepal found an inverse relation between migration and farm production. In the case of a developing nation like Nepal where market imperfections prevail, migration may also lead to a fall in the area of land conserved as land conservation is usually labor intensive (Aryal J. P 2004). Also, whilst taking the case of hired-in
labor it is assumed that hired laborers cannot be a direct substitute of family labor. Aryal (2004) also found that families practicing intensive farming face labor shortages during the peak agricultural season due to an increase in emigration. Therefore in Nepal, migration is not only helping to reduce poverty to some extent as most might point out, but also at the same time it is constricting agricultural production as well (Pant, Raut, Pandey 2011).

These myriads of discussions enlighten the urgent need to study the complex relationship between migration and food security via agricultural production. In the long run, migration can increase the vulnerability of rural farming households, which could astringe the growth of the agricultural sector and eventually the economy as well. Significant research has been carried out in this regard, at both micro and macro levels across countries, but studies focusing on Nepal are quite few and scattered. As we discussed above, very little attention has been paid to analyze the many facets of migration. As of now, findings on migration have been rather mixed. Some suggest remittances have been essential in overcoming credit constrains and are therefore invested in new technologies to increase income opportunities. Whereas other indicators show that, remittances are primarily spent on consumption and livelihood related expenditures and thereby do not have any significant impact on the development of receiving countries.

Therefore it is essential to closely analyze the impact of migration on agricultural production and its subsequent effect on household food security. The objective behind the above discussion is to understand the effects of migration on farm productions of migrant origin households and their food security. But, in this regard, existing literatures have not put much light on the diverse roles of migration on migrant sending economies. In fact existing literatures recurrently emphasize on the positive impact of migration on agricultural production through hypothetically presumed investments in the agricultural sector. In a country like Nepal, where most of the migrant labor force originates from the agricultural sector, emigration is bound to reduce the supply of labor force in the agricultural sector. Generally it is presumed that at the initial phases of migration, surplus labor comes out from the agricultural sector, thereby the productivity of the remaining labor force goes up with gross agricultural production remaining the same. However, over a period, the exodus of labor from agricultural sector creates a shortage of labor force, thereby ultimately decreasing agricultural production.

Migration is preferred over other options available to farming households as a mean to improve their livelihoods, like non-farming self-employment activities, because of the secured income that remittance promises. Although the inclination towards migration makes a household member unavailable for farm activities for extended periods of time, the remittances sent back home aid in improving family livelihood. Therefore, this research is designed with
anticipation to explain the effect of migration on household agricultural production and food security via addition of income in terms of remittances.

2) Empirical Review
Over a period, conflicting views have emerged and been articulated about migration and its subsequent impacts on migrant origin economies. In the process, the outlook on migration has changed and evolved; alternatively numerous theories on migration have emerged such as Neoclassical economic: macro, Neoclassical: micro, New economics of labor migration, Dual labor market theory. According to the NELM (New Economics of Labor Migration), the impact of migration at migrant origin economies can be defined in two extremes - positive or negative. In addition, the effect of migration varies according to various stages of migration and the concerned region as well (Jones 1998). Therefore, it seems essential to discuss what different researches have to say on these two extremes of migration at origin.

In Nepal migration has become a culture in every household; even during the main harvesting seasons 44 percent of households across the country have at least one family member out in pursuance of distant labor opportunities (WFP Nepal 2008). Historically, India has been the destination of preference for Nepali migrants; indeed 40 percent of Nepali migrants still end up in India (WFP 2008). It is really important to understand the impacts of the absence of such a significant fraction of the population from the country on the real economy. Keeping aside its positive impacts on poverty reduction, which has been confirmed by the CBS of Nepal 2003/04, its impact on the agricultural sector is quite depressing. In fact, emigration has deprived the Nepali agricultural sector of critical labor force required at a crucial periods of cultivation. Similarly, in the context of Nepal, mass emigration for foreign employment is only a decade old phenomenon, over a period it has greatly decreased the strength of the labor force available to the agricultural sector and affected agricultural productivity to a large extent, but this exodus of labor has not been studied adequately (Pant, Pandey, Raut 2011).

Due to the weak understanding of the theoretical base which is mired in nineteenth-century concepts, models and assumptions, and results of various earlier studies on migration are merely an imitation of one after another. Conclusions drawn by Durant (1996) in Mexico, Black (1993) in Portugal and Leinback & Watkins (1998) in Indonesia, have granted remittances importance, for they claim that it is directly used to improve agriculture by allowing farmers to - purchase improved inputs, increase yields, grow market crops, expand irrigation and overcome capital and credit constrains. Also, De Haas (2001) in Morocco found that migration leads to agricultural transformation in a positive manner; it was found that households having international migrants had high willingness
to invest in the agricultural sector. One such study from Mexico states that migration leads to an increase in investment in agricultural and household land use decisions, for those who remain behind to stay on the land (Gurri and Morran 2001, Kearney 1996, Massey 1998). Households which have an emigrant, invest a certain amount of that migrant’s earnings in productive sectors, it was even found that migrant household members were spending on long term agricultural investment. Therefore the study concluded that, there is a significant increase in agricultural investment and household welfare due to migration (Cohen 2004). Similarly, De Haas (2005) and Taylor (1996) concluded that, migrant households are more likely to invest in productive enterprises than non-migrant households. In all the above mentioned arguments, the resultant labor-loss relation caused by migration has been overlooked. So, contrary to their findings, emigration is bound to cause a fall in agricultural production and productivity in the long run.

Without denying the immediate favorable impacts of migration on the national economy, the same can also make deprive the agricultural sector of valuable labor force that can affect long term agricultural production. Unlike what is stated in the above arguments, migration can substantially reduce the size of the rural work force and deprive the rural agricultural sector of a large chunk of potential working age population (Black R. 1993). Apart from win-win prepositions, migration has adverse impacts on the agricultural structure of the region. In many cases migration will create labor shortages, which cause stagnation of agriculture, overburdening those who remain (Jokisch B. D 2002). Similarly, Zimmeres K. (1993) found that migration of the male population leads to labor shortages, abandonment of land conservation measures and reduced enthusiasm for agriculture improvement. Migration can increase the total income of a household, but it may not be sufficient to overcome the adverse effects of lost labor. Similar studies from central Mali by Toulmin C. (1992) illustrate that the effect of absence of young men was particularly worse for smaller households and that the receipt of remittance is a poor substitute in the place of young men. Recent studies by Amina M. (2010) in western Nepal concluded that labor emigration is causing a loss of family labor, and thereby leading households to compensate this lost labor through hire-in-labor. However, it is also found that hired labor is unable to replace loss family labor. Therefore, an increase in the number of labor migrants from Nepal in last two decades can be identified as a cause of declining agricultural production (Ray D. P 2004).

Brad (2007) pointed out that migration decelerated agricultural production and shifted people from household activities to the raising of cattle. Jokish B. D. (2002) discussed several effects of migration like inadequate attention to agriculture, deleterious effect on the cultural and social organization that sustains agriculture, stagnation of agricultural bases and overburdening those who remains back. The study has also observed that remittance leads to
 genesis of “moral hazard” on the part of household. Assured incomes in the form of remittances will dis-incentivize households to work more on the field. Azam and Gubert (2006) state that the more households are insured by migrant remittance, the lesser incentives will these households find to work harder in the field. Similarly, Taylor and Wouterse (2008) in Mali, discovered moral hazard on the part of the family members left behind. Rozelle, Taylor and deBrauw (1999), in a study from China found that the loss of labor due to migration has significantly reduced grain yield. Thus, migrant remittance may reduce work effort in the agricultural field which requires physical labor (William S. 2007).

Another notable impact of emigration, which causes decline in agricultural production, comes through the increase in women’s participation in the agriculture work force. The selectivity and blow of migration are unlikely to be gender neutral; specifically, it changes the role women in households play once male members emigrate. Therefore, the effect of male migration is not only limited to fall in productivity on the part of the male members but it also affects the remaining women’s own farm productivity due to the additional responsibility of farm management along with the existing duties of compulsory household works. Now, women are increasingly left with the task of farm management plus having to overcome production constraint in the absence of male household labor (Sifelani Tsiko 2009). One such finding from Nepal confirms a sizeable increase in women’s work load due to male emigration (WFP 2008). This paradigm shift has postulated new concerns; women now have to perform dual roles in the absence of male participants, including basic household works women now have to perform farm work as well. Henceforth, it leads to the “feminization of agriculture” (ICIMOD report 2010, ESAF 2004, Katz 2003). Migration alters the nature of women’s work; it incorporates an additional responsibility of farm management, and thereby increasing the number of tasks performed by women (Richard Black 1993, Schmook 2008).

Even though migration detracts productive labor forces from agriculture, remittance received by households’ results in increased household welfare. One such study by William Shaw (2007) indicates that remittance reduces poverty and contributes towards soothing the consumption of the poor, because the motivation behind migration is to improve earnings and diversify it to minimize risks. In Nepal, it was found that most of the remittances were used for consumption needs such as food, education, clothing and health (WFP 2008). And remittance plays a role of input to increase household welfare (ICIMOD 2010). Durand and Massey (1994), emphasize that remittances are basically used for basic household needs only. Remittance increases household welfare significantly (Black R. 1993). Therefore in spite of some negative impacts of migration, the back door use of remittances helps households to enhance their welfare and food security.
3) **Research Design and Methodology**

This study was conducted in the Kalikot district of Karnali Zone, which has a hilly terrain and is one of the most underdeveloped regions of Nepal. Hilly and mountainous regions have higher incidence of emigration due to higher poverty and insufficient farm production. For most of the migrants from these regions, the primary destination is India because of lower costs, equating to lower risks. Traditionally, populations living in hills and mountains have a smaller farm size and perform subsistence farming only. Therefore, most of the Hilly and Mountainous regions are severely affected by food insecurity due to low farm production. Thus, Kalikot district is preferred because of a higher intensity of migration from this region to India and also a higher incidence of food insecurity.

3.1) **Research Design**

After reviewing existing literature and identifying specific problems, the next step is to identify the data to be used and various sources from where this data can be acquired. Once the required data is collected, it will be used to analyze the general problem.

3.1.1) **Sampling procedure and sample size**

Aligned with the objective of the study, the approach undertaken is to make a comparison between migrant and non-migrant households, and analyze its impact on farm production and food security. A VDC (Village Development Committee) in which both migrants and non-migrants of different castes were available was found to be required. Therefore the DAHA VDC was selected, as it captured the required division of households on the basis of migrants and castes. Four villages from within the DAHA VDC were selected for the study; three representing higher caste populations and one representing lower caste (Dalit) population, from both migrant and non-migrant households.

3.1.2) **Data collection and procedure**

To fulfill the objective of the study, a primary field survey was conducted covering 106 households during the month of December 2011. The assistance of a local village facilitator (VF) was called for because VF’s are known to have thorough knowledge about the village population and local languages. Afterwards a questionnaire structure was developed for the survey, and attention was paid to keep the questionnaire simple and concise to avoid any confusions or ambiguities. And finally the questionnaire was translated into local languages to make sure that the local readers and enumerators understood the questions and objectives clearly.

3.2) **Methodology used for research**
Both quantitative and qualitative information collected during the primary survey was used for the research. Whilst, the qualitative information was self-explanatory, the quantitative information was in more of a raw form; therefore econometric tools were used to make a systematic analysis and comparisons among the variables. The econometric tools were used because it is quite useful in analyzing and interpreting the impact of particular interventions. Based on the information, the analysis was carried out in two steps:

3.2.1) Descriptive Analysis: Mean, median and numbers are used to describe the economic and demographic characteristics of the population and households. Mostly simple tables were used for descriptive analysis.

3.2.2) Econometric Analysis: Econometric tools were used to fulfill the objective of the study. Though econometric tools are a bit complex, they are equally useful in answering research questions. Simple regression analysis was used to conclude the impact of migration on agricultural production and food security. Hence, to form a numeric value of variables and results, STATA software was used.

Econometric Model: Simple regression analysis was used to draw the econometric model. With focus on research questions and objective, dependent and independent variables were sorted out for the model. Due to the difficulty in accessing number of hours of female participation in agriculture, only perception question were used to access female participation in the agricultural work force. Basically one model each was used to assess the impact of migration on food production and security:

Model for Food production:
\[ Y = \beta_0 + \beta_1 + \ldots + \beta_k + u \]
[Y: Farm production, \(\beta_0\): Constant, \(\beta_1, \ldots, \beta_k\): Independent variables, U: Error or residual term]

Model for Food Insecurity:
\[ Y = \beta_0 + \beta_1 + \ldots + \beta_k + u \]
[Y: Food Insecurity, \(\beta_0\): Constant, \(\beta_1, \ldots, \beta_k\): Independent variables, U: Error or residual term]

4) Major findings

4.1) Relation between Migration and farm production

Aligned with the empirical review; this section will discuss the impact of migration on agriculture production based on the primary survey report.

4.1.1) Analytical Approach
Underlining our understanding, the effect of migration is not only limited to the addition of income in the form of remittance but also there are differential effects on agricultural production too. According to the NLEM, people usually migrate in the absence of credit, capital and labor market in underdeveloped countries and the migrant remittance will help households gain access to credit, liquidity and income insurance. In addition, remittances can also be used to invest in agriculture to enhance technologies and to overcome the risk of future fall in consumption due to uncertainty. On the contrary, empirical evidence from the NELM concluded that migration also has labor loss relation, which can restrain the growth of the agricultural sector (J. Edward Taylor). In the presence of imperfect market environments in underdeveloped countries, perfect replacement of ‘lost labor’ is unlikely to be available, and thereby causes an immediate negative impact on agricultural production (J. Edward Taylor).

Resultant, the initial expectation from this study is to observe the variation in agricultural production due to migration. Therefore, this study is using Ordinary Least Square (OLS) to observe factors affecting household farm production.

Model specified as:

\[ \text{FP: } f(Z) \]

\[ Z: h(X_1, X_2, X_3, X_4, X_5, \ldots, X_k) \]

Where,

FP: Food production

Z: vector of explanatory variables

\[ X_1, X_2, X_3, X_4, X_5, \ldots, X_k : \text{Explanatory variables} \]

K: Total no of explanatory variables

**Dependent Variable:**

Total production of Paddy

Total production of Millet

**Explanatory variables:**

Caste of Household

Migration Status of Household

Amount of owned land used for the production

Age of household head

Age square of household head

No of adult member in household
4.1.2) Results and discussion

The analysis is done focusing on those households having involved in the production of paddy and millet. More fundamentally, applying broad views on the preference of cultivation and consumption, these two crops were identified as being sufficient to evoke necessary relation between migration and food production. Similarly, some other crops like wheat and maize were also notably important but are excluded from the analysis because wheat is preferred among the less poor or richer households for both cultivation and dietary needs, whereas in the case of maize, over the past few years its dietary preference has been falling among poorer households. Adding to that, altogether 98 households for paddy and 91 households for Millet were sorted out by regression. Therefore, unlike other crops, paddy and millet are expected to capture the difference in production solely due to migration.

Table 4.1: Estimate effect on Paddy production

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caste</td>
<td>-22.69449***</td>
<td>8.7930</td>
<td>.011</td>
</tr>
<tr>
<td>Migrant Status of Household, (Migrant = 1, Non migrant = 0)</td>
<td>-65.9984**</td>
<td>22.1111</td>
<td>.004</td>
</tr>
<tr>
<td>Owned land Used for Production</td>
<td>1459.866***</td>
<td>59.269</td>
<td>.000</td>
</tr>
<tr>
<td>No of Adult Member in Household</td>
<td>5.3810</td>
<td>5.426</td>
<td>.324</td>
</tr>
<tr>
<td>Age of Household head</td>
<td>4.2338</td>
<td>4.0585</td>
<td>.300</td>
</tr>
<tr>
<td>Age Square term</td>
<td>-.04212</td>
<td>.04247</td>
<td>.324</td>
</tr>
<tr>
<td>Intercept</td>
<td>-28.9968</td>
<td>92.9318</td>
<td>.756</td>
</tr>
</tbody>
</table>

| No. of Observation: 98                           |              |                |         |
| Adjusted R square: 0.9305                         |              |                |         |

Source: Authors Primary survey (2011)

*** Significant at 1 %, ** significant at 5 %, * Significant at 10 %

Table 4.2: Estimate effect on Millet production
<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caste</td>
<td>-1.427</td>
<td>8.202</td>
<td>.862</td>
</tr>
<tr>
<td>Migrant Status of Household, (Migrant = 1, Non migrant = 0)</td>
<td>-42.362**</td>
<td>20.695</td>
<td>.044</td>
</tr>
<tr>
<td>Owned land Used for Production</td>
<td>558.995***</td>
<td>76.37</td>
<td>.000</td>
</tr>
<tr>
<td>No of Adult Member in Household</td>
<td>17.471***</td>
<td>4.519</td>
<td>.000</td>
</tr>
<tr>
<td>Age of Household head</td>
<td>-5.245</td>
<td>3.832</td>
<td>0.175</td>
</tr>
<tr>
<td>Age Square term</td>
<td>.0562</td>
<td>0.0402</td>
<td>0.166</td>
</tr>
<tr>
<td>Intercept</td>
<td>94.8</td>
<td>87.096</td>
<td>0.280</td>
</tr>
</tbody>
</table>

No. of Observation: 91
Adjusted R square: 0.5699

Source: Authors Primary survey (2011)

*** Significant at 1 %, ** significant at 5 %, * Significant at 10 %

**Impact of Migration:**

Traditionally the agricultural sector has been overburdened by excessive labor force; at the initial phases of migration it may have led to an increase in productivity of remaining labor force. However, over a period, when migration becomes a culture, it often created a shortage of labor force in the households, and also in the labor market. Similarly, in the study area, the process of labor migration resulted in the loss of family labor, specially the use of family male labor force for farming. Historically, male migration has been a tradition of study area, during conflict and after the conflict, exodus of labor increased considerably. India is seen as the most preferred destination for male labor migrants to safeguard the livelihoods of family members back home. Empirical observation illustrates that 100 percent (67) of the migrants from the study area were male and more than ninety percent of them chose to migrate to India. Whenever a family member is out to pursue distant employment opportunities, his part of work has to be shared by other members of the household. Typically, when a household is working under full capacity, any additional work in the absence of one or more family members has to be shared by the other members of the
In most cases, additional work burden due to migration is the root cause for the fall in agricultural production. The primary reason for the drop in agricultural production is the loss of productive members of households, which cannot be fully compensated by sharing work among the remaining family members. In addition to this, it is found that most productive young members of a family are more likely to migrate; therefore it becomes even more difficult to compensate the loss of labor. It has been observed that the average age of a migrant in study area is 33.53 and the median is 30 years, it concludes the loss of young and productive members from households. Similarly, in a society where migration is dominated by males, additional work load in the absence of productive male members are often shared by the women in the household. It increases the female work load and overburdens them with an additional role of farm management. Consequently, in the absence of physical competence and skills required to perform both responsibilities effectively, any extra work load due to male migration will lead to a fall in their own productivity. Therefore continuous migration from the rural agricultural sector results in the “feminization of agriculture”, and is succeeded by a fall in agricultural production.

Interestingly, persistence of migrations from rural households makes it even more difficult to find hired-in labor to replace lost family labor. The same preposition is highlighted by the survey results, where 50 percent of the households have reported encountering labor shortages several times a year, in particular during the peak agriculture season. For some reason even if hired labor is available, households are reluctant to use them because of the costs attached with hired labor, and more often than not poor households are unlikely to use any hired labor. Noticeably, women prefer to perform all additional works themselves or through the exchange of family labor between multiple households instead of hired-in labor, as far as possible. Whilst answering our perception questions (Table 6.10), 49 out of 54 migrant households reported that a women’s work load in the farm has increased considerably after the migration of male members and also from the same table, 40 and 43 households out of 54 pointed out experiencing a fall in farm production along with the problem of labor shortages. It has been observed that some households are using the contemporary strategy of exchanges of family labor to reduce the effect of lost family labor. However, the strategic importance of exchanges of family labor cannot be ridiculed, but this strategy is not sufficient to nullify the effects of lost family labor and to reduce women’s workload. Also, exchanges of family labor can only materialize when other households require labor from the same household.

Evidences from the study area illustrate the difference in proportion of family male labor between migrant and non-migrant households. Table 6.7 shows the difference in total male family labor endowment in migrant and non-migrant households. In all (the summation of) migrant households the proportion of male family labor is significantly lesser
than in non-migrant households. Also from perception question table no. 6.10, women have reported an increase in workload and that they spend more time than before in the agricultural fields due to the migration of male members. Therefore it validates the above arguments of labor loss and feminization of agriculture due to the emigration of male labor. Our regression analysis also shows that migration has a significant impact on paddy and millet production, at significance level of 1 percent and 5 percent respectively. Therefore, the negative coefficients of migration for both paddy and millet validate the negative impact of migration on household food production.

**Impact of other factors:**

Though the objective of the study is to analyze the impact of migration on household farm production, other factors affecting farm production are also relevant for the study. Given previous experiences, the caste system is very much prevalent in rural Nepal, which generally structures the role and entitlement of each caste in society. Based on infield experiences and survey reports, it is the lower caste population, which is, mainly dependent on earning wages from the agricultural sector, migrant remittances and subsistence farming. It has been observed that the precarious state of living of lower castes is due to their low occupancy of available agricultural land and a lack of capital to improve the same, when compared to the higher caste population. As a result, the lower caste population has a notably minimal agricultural production in comparison with higher castes. Therefore, the influence of caste on agricultural production is quite vital to design any policies in the future.

The sparse amount of pertinent micro-level survey data on other factors like land, age and no. of adult members in households also establishes a significant relation with agricultural production. Complying with assumptions, land also shares a positive relation with agricultural production. All these factors have positive impacts on production, except age which delivers a negative impact after a certain threshold level. It seems that when an individual crosses a certain level of age, any addition of age will reduce the productivity of that individual. Though there are positive correlations between this factor and agricultural production, age does not have a significant impact on production and the impact of no. of adult members is rather mixed. The effect of number of adults is significant for paddy but not for millet, because unlike paddy, millet is a crop that requires minimal effort for cultivation and planting, and also women’s are primarily preferred for millet plantation. Therefore the impact of migration on millet is minimal compared to paddy.

**4.2) Effect of Migration and remittance on food security at Household level**
As with the impacts on agricultural production, the effect of remittances on the food security of a household is primarily a function of migration selectivity. In the context of this research, if migrants mainly originate from relatively poor households, migration is more likely to imply greater food security for the household. Perhaps, remittances sent back home will elevate the household wellbeing via expenditure of remittance on consumption goods.

Therefore based on the expectations of effects of remittance, the primary survey and descriptive analysis illustrate different levels of food insecurity faced by households, migrant and non-migrant. While collecting primary data on food security, the questions were based on the number of months a household had to face food problem (food insecurity), with only households who own farm production and purchases from non-farm income families were taken into account to measure food security. Therefore, the analysis of food insecurity in this paper is done without taking into account some other components of food insecurity like dietary diversity, calorie intake, per capita expenditure etc., even though they are equally relevant for analysis. Due to time constraint while collecting primary data, it was not possible to collect all information related to food security.

4.1.1) Analytical approach

In our discussions so far, a household migration decision has been found to be coordinated decision of the household to overcome the risks of future fall in consumption, to increase household welfare with the addition of income in the form of remittances and to overcome credit market imperfections. Moreover, remittance plays a role of insurance against any fall in consumption levels due to variant and idiosyncratic risks. In the absence of any income insurance, rural populations are vulnerable to suffer from food insecurity in any future calamity or unwanted event. Thus, the seasonal migration of Nepali workers to India is primarily explained by declining consumption and existence of food insecurity. Seasonal migration to India provides a secondary source of income to Nepali workers, which helps them to cover basic needs (ESAF 2007). Hence, remittances received by households are primarily used to improve their consumption levels. The WFP Nepal (2008) found that a major part of remittances were used for food, health, education and then to repay loans to local moneylenders. Remittances significantly improve the household’s welfare (Peter Quartey 2006). Evidences also suggest that remittance helps to improve the consumption of food and investment in education. Significant differences were noticed in terms of total income, calorie intake and child nutrition status between migrant and non-migrant households in Nigeria (Martinetti C. Enrica 2010). Therefore, migration and remittances are expected to have a positive impact on the household food security situation and increase the basic welfare state of family, though it has some negative impacts on farm production.
In order to access the impact of migration on food security (insecurity), different variables were taken into consideration, which can probably explain the differential impact of migration on food security (insecurity) of households. Therefore, to analyze the impact of migration on food security, we have taken food insecurity (in terms of months) as a dependent variable. Also, in place of migrant household status we shall use remittance as our primary explanatory variable to measure the effect of remittance on food insecurity. At the same time we shall use the total income (excludes remittance) as our explanatory variable, which will explain the impact of other income sources on food insecurity. We are using the same OLS model, which we used in the earlier section, but with different dependent and explanatory variables.

**Dependent Variable:**
Food insecurity

**Explanatory variables:**
Caste of Household
Remittance
Owned land used for the production
Total member in household
Total Income

### 4.2.2) Results and discussion

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caste</td>
<td>1.5016***</td>
<td>.2231</td>
<td>.000</td>
</tr>
<tr>
<td>Remittance</td>
<td>-.000394**</td>
<td>.000176</td>
<td>.027</td>
</tr>
<tr>
<td>Income from Agriculture</td>
<td>9.77</td>
<td>.000021</td>
<td>.963</td>
</tr>
<tr>
<td>Total Income</td>
<td>-7.02**</td>
<td>3.4</td>
<td>.041</td>
</tr>
<tr>
<td>Total member in Household</td>
<td>-.0539</td>
<td>.105</td>
<td>.609</td>
</tr>
<tr>
<td>Intercept</td>
<td>.4714</td>
<td>.7834</td>
<td>.549</td>
</tr>
</tbody>
</table>

No. of Observation: 105
Impact of Remittance:

Results from the OLS estimator suggest a negative impact of remittance on the month of food insecurity for a household and this estimate is quite significant as well. That means the addition of income in the form of remittance is helping households to improve food security. From survey report it can be found that the primary factor influencing migration of members is food insecurity. Therefore, the amount sent back in form of remittances is primarily spent on food consumption.

The average amount of remittance in cash was found to be NPR 20,388, which means every migrant household, keeping other factors constant, will have improvement in their food security condition by .803 month. Not only do households receive remittance in the form of cash, but also in the material forms like clothes, medicine, electronic items etc, which also help improve the general welfare level of the household. While summarizing, we can conclude that remittances are helping households improve their food security situation and general level of welfare. Remittances in the form of cash and kind are equally important for households to improve their livelihood.

Impact of other factors:

The impact of other factors on household food security is equally important to examine. Studies conducted so far have suggested that the lower caste populations are more vulnerable to food insecurity; particularly Dalit households, which are more prone to transitory food insecurity. Therefore, the probability of migration from dalit households is quite high. From discrete statistics it has been found that more than 90 percent of dalit households have at least one migrant member, and the primary reason for migration is either food insecurity or unemployment. Other than caste other significant factors affecting food insecurity are income from agriculture and total income from other sources, which are quite obvious, the higher the income from agriculture and other sources the higher the production and purchasing power, hence higher food security (lesser food insecurity). Although remittance is reducing food insecurity, it is has also been found that remittance receiving households, particularly lower caste (Dalits) ones have been severely affected by food insecurity. Also, dalit households are found to be greatly involved in migration. It signifies that the effect of caste is more than that of the effect of remittances. More precisely, lower cast households
have a higher probability of facing food insecurity compared to higher castes, so they are the one who migrate first. In most cases, remittances are not sufficient enough to totally overcome food insecurity of lower cast households; it only serves to reduce food insecurity to some extent. Therefore lower caste households don’t have much of an option, rather than to remain a migrant for longer periods of time. Table 6.11 illustrates that, more than 90 percent of dalit (Lower caste) households are involved in migration, and despite this all, Dalit (lower caste) households including migrant ones are severely affected by food insecurity. Therefore we can conclude that dalit households are prone to food insecurity despite of migrant income.

5) Conclusion:

After analyzing the primary data, it can be concluded that migration derived from the rural agricultural sector has significant impact on sending households both ways. Migration also has quite a negative impact on the production of paddy and millet due to the loss of male family labor. Households left with only females to manage farm and other activities, use none or very less hired labor because of the costs attached, which poor households cannot afford. Under such circumstances women’s participation in the agricultural labor force has increased, however increased women’s participation doesn’t overcome the loss of male work force due to difference in physical competence between the genders. Also, in most cases hired laborers are unable to make up for lost family labor, thus all these factors are resulting in a negative impact on crop production.

Migration has complex relations; in one hand it decreases crop production through the loss of valuable male family labor, on the other hand, it helps households minimize food insecurity. This finding also provides evidence that remittance has significant effects on the improvement of household food security with the addition of income in form of remittance. Results from this study indicate that migration is a collective decision of the entire household and the primary reason for migration from the study area is a risk of food insecurity. Similarly, lower caste populations are prone to food insecurity, and remittances sent back home are not sufficient to overcome consumption deficiencies. Therefore lower caste migrants have no choice but to stay in exile to earn for their families.

Reference


Hein De Haas (2001). Migration and agricultural transformations in the oases of Morocco and Tunisia. KNAG.


appendix

6) Field study results

This section will illustrate the field study results and their interpretation. Households are divided according to their status of migration along with their other major characteristic. Simple tables were used to explain the characteristic and information about the households.

6.1) Household characteristics:

Division of Household

Households are divided according to caste and gender. This figure also includes the absent migrant members of households. When we compared household size across the caste, it does not shown noticeable difference, which means all three different castes posses similar size.

<table>
<thead>
<tr>
<th>Caste</th>
<th>Total Household</th>
<th>Total Members</th>
<th>Male</th>
<th>Female</th>
<th>Avg. Size of HH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bramins</td>
<td>49</td>
<td>277</td>
<td>134</td>
<td>143</td>
<td>5.65</td>
</tr>
<tr>
<td>Chettri</td>
<td>20</td>
<td>147</td>
<td>75</td>
<td>72</td>
<td>7.37</td>
</tr>
<tr>
<td>Dalits</td>
<td>37</td>
<td>221</td>
<td>109</td>
<td>112</td>
<td>5.97</td>
</tr>
</tbody>
</table>

Majority of households are involved in agriculture activity, and primary occupation of households adult and head is agriculture. Table also shows that major occupation for majority of adult member who has age above ten is also agriculture.

<table>
<thead>
<tr>
<th>Agriculture</th>
<th>Masson</th>
<th>Office</th>
<th>Teaching</th>
<th>Business</th>
<th>Laborer</th>
<th>Politics</th>
<th>Astrology</th>
<th>Total</th>
</tr>
</thead>
</table>


While accessing the education level among the adult members of households, with 3.9 is average years of education across the adult population, the level of education differs across the caste. Apparently, Dalits adult population has 2.98 years of average education, whereas Bramin and chettris has relatively higher 4.32 average years of education.

6.2) Migration in the sample area

In total of 54 emigrant households in the area, 10 of them have more than one migrant member. Excluding two household, migrants’ destination for the rest is homogeneous, and they prefers to migrate India for its easy accessibility, cost effectiveness and less risky in term of return, employment and earning. Also, out of 67 migrants, 65 of them are migrated to India and remaining two is migrated to Qatar. Numbers of migrants who lives in India mostly works in informal sector on contractual basis. Their work is temporary in the sense that they can return home at peak agriculture session every year. Most of the migrant migrates to India during winter season (Dec/Jan) when season is not conducive for the agriculture, and they spend about 8.91 months each.

Table 6.3: Pattern of Migration

<table>
<thead>
<tr>
<th>DEC/JAN</th>
<th>FEB/MAR</th>
<th>MAR/APR</th>
<th>MAY/JUN</th>
<th>JUL/AUG</th>
<th>AUG/SEP</th>
<th>SEP/OCT</th>
<th>OCT/NOV</th>
<th>NOV/DEC</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>11</td>
<td>10</td>
<td>67</td>
</tr>
</tbody>
</table>

It has found that most of the migrant originates from dalit households for different reason. Out total 37-interviewed dalit household, 36 of them have at least one migrant member. In addition, out of 67 migrant from study area, 68.65 percent are dalits.

Table: 6.4: Migrant member according to caste

<table>
<thead>
<tr>
<th>Bramins</th>
<th>Chettris</th>
<th>Dalits</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>6</td>
<td>46</td>
<td>67</td>
</tr>
<tr>
<td>22.3%</td>
<td>8.95%</td>
<td>68.65%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Given the composition of family members and migrants, most important variable we have to consider is average age of migrant. The mean age of a migrant is 33.53 years and median is 30 years, which concludes most productive
members of household prefer to migrate. This also explains a major difference in the labour use patterns in migrant and non-migrant households.

**Reason for Migration:**

Households have varied reason to choose migration as alternative source of income. More specifically, even primary survey report illustrates, food deficit faced by households is the major reason for the migration, which is further accentuated by the poverty and unemployment in the region. Out of total 53 households, 41 of them have said food deficit is a primary reason for the migration, also poverty and unemployment add into the problem of food deficit. We can also noticed that average number of dependent in migrant and non-migrant households, and its fractionally higher in migrants household 2.46 compared to non migrants 1.96. From the figure of average number of dependent in migrants and non-migrants, we cannot say anything substantial in relation to migration decision.

**Table: 6.5: Reason for migration**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Food Deficit</th>
<th>Poverty</th>
<th>Unemployment</th>
<th>Debt Repayment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>53</td>
<td>41</td>
<td>3</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table: 6.6: Average economic dependent member (child below 10 years of age)**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant</td>
<td>.87</td>
<td>1.94</td>
<td>2.46</td>
</tr>
<tr>
<td>Non Migrant</td>
<td>2.17</td>
<td>2.21</td>
<td>1.96</td>
</tr>
</tbody>
</table>

**6.3) Labor Endowment**

Households size itself reflects the labor endowment of the household. In study area, all family members above age of 10 have certain responsibility towards household, primarily farming followed by household work. Therefore, according to the result in table indicates that number of male household worker is comparatively less in migrant households than non-migrant, whereas, women do not migrate, the number of female household workers are relatively similar in both migrant and non-migrant household.

**Table: 6.7: labor endowment in migrant and non-migrant household**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Bramins</th>
<th>Chettris</th>
<th>Dalits</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant HH</td>
<td>48</td>
<td>105</td>
<td>39</td>
<td>30</td>
<td>84</td>
<td>153</td>
</tr>
<tr>
<td>Non-Migrant</td>
<td>114</td>
<td>112</td>
<td>150</td>
<td>69</td>
<td>7</td>
<td>226</td>
</tr>
</tbody>
</table>
Out of 106 surveyed households, 54 answered with facing labor shortage in the area, even during peak agriculture season finding hired-in labor is difficult when household had to employ additional labor. This problem is exhibited by the increase in incidence of migration from the study area from a long time.

6.4) Cropping Pattern

From past ten years, paddy is most important cereal crop in the study area followed by wheat, millet etc. Traditionally staple cereal crop in the study area was a millet and maize, but since last two to three decades, people choice had shifted to paddy. Therefore, they use land primarily for the production of paddy and then followed by other crops. Nonetheless, over a period, preference for other crop has gone down but household still prefer to cultivate more than two crops annually.

Table: 6.8: Yield of various crops

<table>
<thead>
<tr>
<th></th>
<th>Paddy (Kg)</th>
<th>Wheat (Kg)</th>
<th>Maize (Kg)</th>
<th>Millet (Kg)</th>
<th>Potato (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant HH</td>
<td>24500</td>
<td>9500</td>
<td>7380</td>
<td>6320</td>
<td>2500</td>
</tr>
<tr>
<td>Average</td>
<td>544</td>
<td>206</td>
<td>210.8</td>
<td>162</td>
<td>250</td>
</tr>
<tr>
<td>Non-Migrant HH</td>
<td>14920</td>
<td>6620</td>
<td>3700</td>
<td>5235</td>
<td>4350</td>
</tr>
<tr>
<td>Average</td>
<td>281</td>
<td>124.9</td>
<td>217.6</td>
<td>100.6</td>
<td>483</td>
</tr>
</tbody>
</table>

6.5) Consumption pattern

Corresponding to change in pattern of production of traditional cereal crop, over the period, the consumption pattern has also changed, now preference for rice and wheat has been increased substantially in place of Millet. Nevertheless, dependency on traditional crop likes millet for daily consumption is continued to exist among relatively poor households. Out of 106 households, 100 households consumes rice every day, also the consumption frequency is high for wheat and millet as well. Higher consumption of rice is also due to the status factor in the region, households that prefer rice and wheat attains higher status in community. Therefore, from present information on preference of
production and consumption, we have opted for two crops, namely paddy and millet, to measure the impact of emigration and other factor on production.

Table: 6.9: consumption pattern of various crops

<table>
<thead>
<tr>
<th>Crop</th>
<th>Not at all</th>
<th>Every day</th>
<th>Very few days</th>
<th>Only on festivals</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>0</td>
<td>100</td>
<td>4</td>
<td>2</td>
<td>106</td>
</tr>
<tr>
<td>Wheat</td>
<td>2</td>
<td>90</td>
<td>14</td>
<td>0</td>
<td>106</td>
</tr>
<tr>
<td>Meat</td>
<td>1</td>
<td>5</td>
<td>16</td>
<td>84</td>
<td>106</td>
</tr>
<tr>
<td>Millet</td>
<td>6</td>
<td>81</td>
<td>19</td>
<td>0</td>
<td>106</td>
</tr>
</tbody>
</table>

6.6) Perception question:

Survey questionnaire was also designed with perception question to know the peoples real experience in study area in relation to the impact of various factors, alternatively, factor which are affecting food production and food production. Therefore, perception question was primarily designed for migrant household only in order to fulfill the objective of research.

Table: 6.10: Perception of migrant household

<table>
<thead>
<tr>
<th>Decline in production due to migration of HH member</th>
<th>Labor shortage due to the migration of male member</th>
<th>Women have to work more in the farm due to migration</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>43</td>
<td>49</td>
</tr>
</tbody>
</table>

Out of 54 surveyed migrant household, 40 household reported having experiencing fall in agriculture production due to the migration of member. Further, 43 household admit that they are facing labor shortage problem due to male migration, also difficulty in finding hire labor to substitute the loss of migrant member. Women’s participation in agriculture and number of hours women need to spend in agriculture has increased in the absence of male member. Among migrants household, women’s of 49 household have to spend more time in the field and women’s participation in agriculture have also increased.

6.7) Food Security:
Survey report also suggest that problem of food insecurity primarily exists among lower caste population. All the dalit households are food insecure and the extent of food insecurity among dalits are higher than the other higher caste.

Table: 6.11: State of food security

<table>
<thead>
<tr>
<th></th>
<th>Bramins and Chettris (No of HH)</th>
<th>Dalits (No of HH)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Insecure</td>
<td>23</td>
<td>37</td>
<td>60</td>
</tr>
<tr>
<td>Average (In Months)</td>
<td>3.60</td>
<td>5.73</td>
<td>4.91</td>
</tr>
</tbody>
</table>