Impact of Social Networks on Labor Migration Decision in Nepal

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1. Introduction

The purpose of this paper is to identify the relationship between choice of destination to migrate and the social networks variables, and to investigate if the impact of social networks on choice of destination to migrate varies with different regions. Migration is a strategy for livelihood and spontaneous process for re-distribution of population in the process of economic development. Migration unlike fertility and mortality is the least researched and understood component of demographic dynamics in Nepal despite the fact that many of Nepal's socio-economic and political problems are interwoven with the process of both internal and international migration (KC [9]). What are the major determinants that influence labor for the choice of destination to migrate? Do the social networks matter for the labor to choose destination for migration? These are some brain storming questions which need to get solution during the course of this paper.

The findings of this paper suggest that social networks have a more important role for rural to urban migration of labor than rural to rural or urban to urban migration. On average, the impact of social networks in case of rural-urban migration of labor is found to be 6 times stronger in comparison to rural-rural migration and 24 times stronger in comparison to urban-urban migration. Urban origin labors are found interested to migrate to other urban areas with the help of their social networks but they are found unwilling to migrate to rural area. Economic variables such as wage differentials between origin and destination and high unemployment rate in origin are also found to be positive stimulus for choice of destination to migrate.

Migration is caused by migrant networks in origin and destination, which minimizes risk and cost and maximizing opportunities (Gurak and Caces [6], Massey [11], Taylor [14]). Migrant networks are sets of interpersonal ties that help to connect migrants, former migrants and non-migrants in origin and destination through kinship, friendship and shared community origin (Massey et al. [12]). To decide either to migrate or not depends upon the desire to minimize risks (Guilmoto and Sandran [5]). There is a positive influence of migrant networks on decision to migrate (Winters, Janvry and Sadoulet [16]).

The effect of migration networks varies by the gender in both international and internal migration (Curran and Fuentes [3]) and for women, family networks are more important (Heering, Erf and Wissen [8]). Female migrants and migrants without household registration status are more likely to rely on well-developed migration networks; whereas younger migrants and those with higher level of education are less likely to depend on migration networks (Liang and Morooka [10]).

The study about the labor migration in Nepal is based on relative deprivation theory (Bhandari [1]) and environmental security (Shrestha and Bhandari [13]) suggesting that there is an important role of deprivation factors (such as relative land deprivation) and environmental insecurity (such as decrease in access to firewood) for labor migration decision in Nepal. None of the studies has focused on the impact of social networks on choice of destination to migrate within Nepal which validates the significance of this research.

2. Data and Methods

The source of data is NLSS II (CBS [2]). In 2003/2004 a household survey was implemented by the Government of Nepal, which contains information on broad range of economic and social indicators such as housing, consumption, education, health, migration, employment, maternity, credit, savings, remittances and community characteristics. The sampling frame consisted of enumeration areas such as: wards and sub wards spread over 3

ecological zones, 5 development regions, 75 districts, 58 municipalities and 3914 Village Development Committees (VDCs) and covers information from 21,531 individuals living in 3,912 households from 334 Primary Sampling Units (PSU) of the country[1]. The sample of 334 PSUs was selected from six strata[2] using Probability Proportional to Size (PPS) sampling with the number of households as a measure of size.

2.1 Construction of Social Networks

To construct social networks of migration the following two assumptions are made: first is that presences of family members or friends in destination are the links that work as networks for the migrants before migration, and second is that family members or friends sending remittances are the links that work as networks for the non-migrants. In this paper, labor is from an economically active group of population having (15-59) years of age. Among the 11,004 labors under survey, 1,857 were with social networks which is 16.9% (among them 14.3% had family networks and 2.6% had friend networks). Family networks further include wife/husband, son/daughter, grandchild, father/mother, sister/brother, niece/nephew, son/daughter in-law, brother/sister in-law, and father/mother in-law.

2.2 Empirical Model[3]

For utility maximization, a person chooses to migrate for work if the utility obtained from earning afterwards is greater than that would be obtained if one does not migrate. Choices may be 1, 2 or 0 where 1= a person chooses to migrate for work within that region (rural/urban), 2= a person chooses to migrate to another region (rural/urban) and 0= a person chooses to stay at origin (not to migrate). The indirect utility (U_{ij}) of i^{th} person with j^{th} alternative for migration can be written as follows:

(1) $$U_{ij} = X_{ij}\,\beta_j + Z_i\,\gamma + \varepsilon_{ij}$$

Where, X_{ij} is attributes of choices and varies across the choice alternatives and across individuals as well (Female*Family networks, Male*Family networks, Female*Friend networks, Male*Friend networks, Unemployment rate, Wage differential), Z_i is characteristics of the individual and same for all choices but varies across individuals (Household size, Age, Marital status, Education level, Percent of male in household and Distribution by regions), β_j and γ are respective parameters, and ε_{ij} is error term. Probability that i^{th} person chooses a j^{th} alternative for migration can be expressed as follows:

(2) $$P_{ij} = \Pr\,(U_{ij} > U_{ik}) \text{ for } k \neq j,$$

Let define Y_i by argmax(U_{i0},U_{i1},U_{i2}, ... ,U_{iJ}), so that Y_i takes on a value in {0,1,2,...,J}. It is assumed that ε_{ij} are independent and identically distributed (i.i.d.) with the type I extreme value distribution. Let j=0 be reference category and using convenient normalization, we obtain;

(3) $$\Pr(Y_i = j) = \frac{e^{(X_{ij}\,\beta_j + Z_i\,\gamma)}}{1+\sum_{j=0}^{J} e^{(X_{ij}\,\beta_j + Z_i\,\gamma)}} \quad (j = 1,2,\cdots,J)$$

(4) $$\Pr(Y_i = 0) = \frac{1}{1+\sum_{j=0}^{J} e^{(X_{ij}\,\beta_j + Z_i\,\gamma)}}$$

Thus, log of Odds Ratio (OR) is given as follows (Wooldridge [17]):

(5) $$\log\left[\frac{\Pr(Y_i = j)}{\Pr(Y_i = 0)}\right] = X_{ij}\,\beta_j + Z_i\,\gamma \quad (j=1,2,\cdots,J)$$

Differentiating equation (5) with respect to a regressor, the marginal effects are given as follows (Greene [4]):

$$\frac{\partial P_j}{\partial (X)_k} = [P_j(1 - P_k)]\,\beta_k \tag{6}$$

$$\frac{\partial P_j}{\partial (Z)_k} = [P_j(1 - P_k)]\,\gamma_k \tag{7}$$

Where, P_j and P_k are response probabilities, β_k and γ_k are the k^{th} element of β and γ. For simplicity, the results are presented as marginal effects (Odds Ratio-OR) and change in marginal effects (OR-1) as in table 2 and 3.

2.3 Specification of Variables

Dependent Variable: *Choice of destination to migrate* is the dependent variable and it is operationalized as multinomial and takes three values. If choose to migrate within the area 1, to other area 2 and stay at origin 0.

Independent Variables: *Social networks variables* are the main independent variables. The construction of social networks variables is already discussed above. These are binary variables and take values 1 and 0. Social networks variables are divided into family networks and friends networks. With interaction to the gender male and female they are further divided as: female family networks, male family networks, female friend networks and male friend networks. Other independent variables are *economic variables* (unemployment rate and wage differentials). Unemployment rate of origin is taken as unemployment rate variable. It varies from district to district. Mean daily wage differential between origin and destination is taken as wage differential variable for migrants and for non-migrants nearest urban area or where they have networks is assumed as possible destination to find the destination wage.

Control Variables: *Human Capital Assets Variables* are household size, age, marital status (married=1), education level and gender composition (percent of male in household) and *Regions* – the regional dummies based on ecological zones (Mountains, Hills and Terai).

3. Empirical Results

Table 1 shows the summary statistics. On average 33% migrant labor are from rural origin and 4% are from urban origin. The average unemployment rate at origin is 32.2% and the average daily wage differential is 54.6 Nepali Rupees (NPR). 63% labors are married with average household size of 6.7 and age 27.7 years. Majority of migrants (84%) have 6-12 years of education while 10% have lower level and 6% have higher level of education. Almost 60% of labors are from Hills.

3.1 Multivariate Results for Rural Origin Labor

The estimates for rural origin labor are presented in table 2. In the second column of the table estimated coefficients are shown, while in third and fourth column the marginal effects (Odds Ratio-OR) and the change in marginal effects (OR-1) in comparison to reference category are given for the labors those choose to migrate from rural to rural areas. The rest columns of the same table shows the similar coefficients for the labors that choose to migrate from rural to urban areas. As suggested by pseudo-R squared, more than 14 % of the variation in the dependent variable is explained by the model.

Rural-Rural Migration of Labor: For rural-rural migration, social networks variables, economic variables, human capital assets variables and regional dummies are significant but percentage of male in household is not significant.

The rural origin female labors with family networks are about 2 times (1.98) likely to choose rural area to migrate and the rural origin male labors with family networks in destination are more than 2 times (2.47) likely to choose rural area to migrate in comparison to the rural origin labor with no such networks. Similarly, rural female labors with friend

networks are more than 6 times (6.43) likely to migrate and rural male labors with friend networks are more than 5 times (5.44) likely to migrate to rural area. Friend networks are more influential than family networks to choose the rural destination for rural labor to migrate. Labor migration from rural to rural area is likely to increases with increase in unemployment rate in origin, wage differential and household size but decreases with increase in age and marital status (married). Higher educated labors are more likely to migrate than those with only lower level education. Similarly, labors from Mountains and Hills are less likely to migrate than the labor from Terai regions.

Table 1. Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.
Dependent Variables (multinomial: 1,2 or 0)				
Choice of destination to migrate (Rural Origin)	0.33	0.47	0	2
Choice of destination to migrate (Urban Origin)	0.04	0.21	0	1
Social Networks Variables (interaction dummies)				
Female*Family networks	0.07	0.26	0	1
Male* Family networks	0.07	0.26	0	1
Female* Friend networks	0.01	0.12	0	1
Male* Friend networks	0.01	0.11	0	1
Economic Variables				
Unemployment rate (in percent)	32.19	9.90	11.11	54.21
Wage differential (in Nepali Rupees)	54.59	24.99	0	128
Human Capital Assets Variables				
Household size (number of persons)	6.66	3.26	0	33
Age (in years)	27.73	11.97	15	59
Marital Status (dummy, married=1)	0.63	0.48	0	1
Education Level (dummies)				
Lower (0-5 years)	0.10	0.31	0	1
Middle (6-12 years)	0.84	0.37	0	1
Higher (13 and above)	0.06	0.23	0	1
% of male in Household	44.97	22.58	0	100
Distribution by Regions (dummies)				
Mountains	0.11	0.31	0	1
Hills	0.57	0.50	0	1
Terai	0.32	0.47	0	1

Source: Author's calculation based on NLSS II, 2004 (CBS [2])

Rural-Urban Migration of Labor: Rural female labors with family networks are more than 23 times (23.39) likely to choose urban destination and rural male labors with family networks are more than 13 times (13.03) likely to choose urban destination in comparison to the labors with no such networks. Similarly, rural female labors with friend networks are more than 22 times (22.31) likely to migrate to urban area and rural male labors with friend networks are more than 25 times (25.55) likely to migrate to urban area compared to those with no such networks. Comparing between these networks, family and friend networks are influential in same manner for female but for male; friend networks are more influential for rural-urban migration. Unemployment rate, wage differential and age are significant in similar manner but unlike rural-rural case, married labors are more likely to choose urban destination from rural origin. Labors with middle level of education (6-12 years) are likely to migrate from rural to urban destination than those with only lower level education.

While comparing between rural-rural migrations to rural-urban migration, estimation results suggest that the impact of social networks is stronger for rural-urban migration than for rural-rural migration. This is because for those labor who involve in rural-rural migration, though the destination is new, they face the same type of rural environment as origin and they can easily settle even without networks but in case of rural-urban migration the environment is

completely strange and different than the origin. In new and strange environment, the migrated labor needs support to settle. Their networks help them in daily activities and also give valuable information about their living. They also supply free foods and lodging for some days before settlement. This will facilitate the migration process and reduce the cost and risk of migration. This shows that the impact of migration networks varies with regions and they are more important for rural-urban migration of labor than rural-rural migration.

Table 2. Multinomial Logistic Estimates for Rural Origin Labor#

Variable	Rural- Rural			Rural - Urban		
	Coefficient	OR	OR-1	Coefficient	OR	OR-1
Social Networks Variables (interaction dummies)						
Female*Family networks	1.09***	2.98	1.98	3.19***	24.39	23.39
Male* Family networks	1.24***	3.47	2.47	2.64***	14.03	13.03
Female* Friend networks	2.00***	7.43	6.43	3.14***	23.31	22.31
Male* Friend networks	1.86***	6.44	5.44	3.27***	26.55	25.55
Economic Variables						
Unemployment rate (in percent)	0.03***	1.03	0.03	0.08***	1.07	0.07
Wage differential (in Nepali Rupees)	0.002***	1.01	0.01	0.04***	1.04	0.04
Human Capital Assets Variables						
Household size (number of persons)	0.03***	1.03	0.03	0.042	1.04	0.04
Age (in years)	-0.18***	0.83	-0.17	-0.37***	0.68	-0.32
Marital Status (dummy, married=1)	-0.11***	0.89	-0.11	1.37***	3.93	2.93
Education Level (dummies)						
Lower (0-5 years)	-----	----	----	----	----	---
Middle (6-12 years)	0.33**	1.39	0.39	2.44***	11.48	10.48
Higher (13 and above)	0.24**	1.28	0.28	1.63	5.13	4.13
% of male in Household	0.001	1.007	0.007	0.009	1.009	0.009
Distribution by Regions (dummies)						
Mountains	-0.22***	0.79	-0.21	0.09	1.09	0.09
Hills	-0.13***	0.87	-0.13	-0.43	0.64	-0.36
Terai	----	---	---	----	----	----
Constant	0.92***	2.50	1.50	-8.45***	0.0002	-0.9998
Pseudo R –squared	0.1405					
Chi-square	1996.15***					
Log likelihood value	-6086.45					
N	11004					

Note: *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level
Dependent variable: Choice of destination to migrate, Reference: Not to migrate
Source: Author's estimation based on NLSS II, 2004 (CBS [2])

3.2 Multivariate Results for Urban Origin Labor

The estimates for urban origin labor are presented in table 3. As suggested by pseudo-R squared, more than 17 % of the variation in the dependent variable is explained by the model.

Urban-Urban Migration of Labor: The social networks variables, economic variables, some of human capital assets variables, some of regional dummies are found to be significant but the household size and age are insignificant. Comparing between the family and friends networks, friend networks are more influential than family networks to choose the urban destination for urban labor to migrate which is consistent as the results shown above in the case of rural-rural and rural-urban migration. Labor migration from urban area to urban area increases with increase in middle level education and proportion of male in household but decreases with married labor. Similarly, labor from Mountains are more likely to migrate from urban to urban areas while those from Hills are 13% less likely to migrate from urban to urban area than the labor from Terai regions.

Urban-Rural Migration of Labor: Since in the data set there is no observation which supports the urban to rural migration, by our intuition we can say that labor does not migrate from urban to rural area. This is because in urban areas, there are more facilities and more opportunities than rural areas. As the theories say migration is a strategy to cope with risk and search for better opportunities for livelihood, being no evidence of urban-rural migration of labor supports this theory.

4. Concluding Remarks

Estimated results suggest the positive influence of social networks on choice of destination to migrate which is consistent to the findings of Winters, Janvry and Sadoulet [16]. The impact of friend networks is found to be stronger than the impact of family networks for rural-rural labor migration decision. For rural-rural migration, it is 3 times more in female and 2 times more in male. For rural-urban migration, it is almost similar between male and female.

The family and friend networks are more influential for rural-urban migration than rural-rural and urban-urban migration. While comparing the results of rural-urban migration to rural-rural and urban-urban migration, on average the social networks are found 6 times more influential in case of rural-urban migration than rural-rural migration and 24 times more influential than urban-urban migration. This is because in case of intra-regional (within rural or urban) migration, the settlement is easier even without the help of networks due to similarity in environment but in case of inter-regional (from rural to urban) migration the environment totally changes from the previous one and the migrants labor needs more help from the networks. This shows that impact of social networks for the choice of destination varies with the regions. Since migration of labor is for betterment of life there is no evidence of labor migrating from urban to rural areas.

Table 3. Multinomial Logistic Estimates for Urban Origin Labor##

Variable	Urban - Urban		
	Coefficient	OR	OR-1
Social Networks Variables (interaction dummies)			
Female*Family networks	0.71***	2.03	1.03
Male* Family networks	0.23***	1.25	0.25
Female* Friend networks	1.12***	3.06	2.06
Male* Friend networks	1.16***	3.19	2.19
Economic Variables			
Unemployment rate (in percent)	0.03***	1.03	0.03
Wage differential (in Nepali Rupees)	0.02***	1.02	0.02
Human Capital Assets Variables			
Household size (number of persons)	0.02	1.02	0.02
Age (in years)	-0.016	0.98	-0.02
Marital Status (dummy, married=1)	-1.44***	0.23	-0.77
Education Level (dummies)			
Lower (0-5 years)	....	.....	.....
Middle (6-12 years)	0.39**	1.47	0.47
Higher (13 and above)	-0.31	0.73	-0.27
% of male in Household	0.009**	1.009	0.009
Distribution by Region (dummies)			
Mountains	0.79***	2.20	1.20
Hills	-0.13***	0.87	-0.13
Terai	....	---	---
Constant	-5.01***	0.006	0.994
Pseudo R –squared	0.1754		
Chi-square	925.01***		
Log likelihood value	-1654.72		
N	11004		

Note: *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level
Dependent variable: Choice of destination to migrate, Reference: Not to migrate
Source: Author's estimation based on NLSS II, 2004 (CBS [2])

The economic variables, unemployment rate of origin and mean daily wage differential between origin and destination are conformed important determinants of both intra-regional and inter-regional migration having positive association with choice of destination to migrate. This result is consistent with the theory of migration (Todaro [15], Harris and Todaro [7]). The younger and middle level educated labor is found more movable in nature in search of better

education, skills and opportunities. This result is consistent to many studies in migration literatures which indicate that migration is common among younger and more educated workers.

Since, community level organizations of migrants that can play major role for migration of labor, are not so developed in Nepal and lacked in data; that's why, in this paper, the other aspects of the role of social networks in labor migration decision in Nepal such as migration culture, community level organizations could not be covered. There is a need for more empirical research in this area, which can continue to examine the migration patterns and behaviors of the people within these regions.

Notes:

1) The sample frame was based on the 2001 population census.

2) Six explicit strata were: Mountains, Kathmandu Valley urban area, other urban areas in the Hills, Rural Hills, Urban Terai and Rural Terai.

3) Similar type of model was used to study the impact of environmental insecurity variables on labor migration in Nepal (Shrestha and Bhandari [13]).

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