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Social Vulnerability Indices of Seasonal Rural-to-Rural Migrant: A Comparative Study of Migrant-Sending and Non-Migrant Households in Northwest Ethiopia

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Abstract

Subsistence agriculture is the base of smallholder farmers' livelihood in Ethiopia, though it is challenged by different risks. Seasonal migration is therefore a common phenomenon for rural poor people in western Ethiopia to reduce risks. As a result, the increased migration of people is the manifestation of the pervasive risk of the day in the country. Hence, this study investigated the social vulnerability of seasonal migrant-sending households comparing with non-migrant households. Two-stage sampling technique was adopted to select 188 households for primary data collection using household interview schedule, key informant interview, and focused group discussion. Also, relevant published and unpublished documents were reviewed to collect secondary information's. Descriptive statistics like mean, percentage, and inferential statistics like Chi-square were employed for data analysis. The Principal Component Analysis (PCA) was applied to develop the social vulnerability index (SVI). The result of data analysis showed that migrant-sending households are less vulnerable than non-migrant households (X2=9.0823, p<05). The income from migrant household members increased migrant sending households' livelihood diversification, and reduced the food shortage in the households compared to non-migrant households. This paper concludes that seasonal rural-to-rural migration in the Northwest Ethiopia is found to be livelihood risk minimization and means of livelihood. Thus, pay attention by stakeholders is demanded to enhance the positive impact of seasonal rural-to-rural migration to the livelihood of migrant sending households.

Keywords: *Livelihood, Migrant, Principal Component Analysis, Social Vulnerability*

1. Introduction

In Ethiopia, agriculture is the mainstay of the economy and primary means of livelihood of smallholder farmers (MoFED, 2011; UNDP, 2016); contributing about 35% of the country's Gross Domestic Product (GDP), 68.2% of employment, and 90% of the total export

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earnings of the country (FAO, 2019). However, its productivity is critically constrained by reduction of farm size with high population growth, institutional, environmental, and technology factors (Kirsten et al., 2012; Salami et al., 2010; World Bank, 2007). This affects the livelihood of smallholder farmers due to the sector low performance (Amogne et al., 2013).

As a result, recent studies (Deshingkar & Grimm, 2005; Hermans & Garbe, 2019; Zeleke et al., 2008) showed that internal and international migration is a common livelihood risk diversification and livelihood improvement strategy adopted by agricultural households. It helps to bridge the financial gap and input requirements of the rural farmers or 'asset accumulation' (Abate et al., 2020). Empirical evidences in Ethiopia or other migrant sending areas confirmed that migration has a positive impact on improving livelihood (Hua et al., 2017; Semela & Cochrane, 2019; Wondimagegnhu & Zeleke, 2017).

However, Ethiopia is experienced with higher level of internal migration than international migration due to the natural and socio-economic factors (Mberu, 2006). It is initiated by natural risk such as landlessness, degradation, climate change, drought and to cover immediate need like food shortages (Atinkut & Mebrat, 2016; Hermans & Garbe, 2019). It is also practiced to supplement the income from agriculture and to overcome the problem of farmland scarcity through the income earned from migrants (Asfaw et al., 2010).

Similarly, in the Northwest Ethiopia, internal migration becomes the common livelihood strategy of rural farm households (Teweldebrihan et al., 2020). Farm household members migrated from a low level of agricultural production in highlands to cash crop-producing lowland areas of Metema, Quora, Tegedie, Humera, Tach Arimachiho and Lay Arimachiho districts, mainly during the peak labor demanding months of the weeding seasons (June-October) (Zeleke et al., 2008) at the destination. Limited number of migrants also migrated from February to May for clearing and preparing the farmland; and in the harvesting season of November and December (Asfaw et al., 2010; Marie et al., 2018).

Besides the fact that, rural-urban migration and multidimensional aspect of international migration have got a great concern (Abire & Sagar, 2016; Adugna, 2019; Clech et al., 2020; Delango, 2019; Eshetu & Beshir, 2018). However, limited information is available about the impact of seasonal rural-to-rural migration on social vulnerability of migrants sending households (Abate et al., 2020; Ayele & Degefa, 2019, 2020). This implies that further disaggregated evidence about the seasonal rural-to-rural migration in the region is crucial to better notify policy formulation. Hence, this study aimed at investigating the level of social vulnerability of migrant-sending households in comparison with non-migrant households in the Northwest Ethiopia.

Research Methods

The study was conducted in Northwest Ethiopia taking the sample of three dominant international and internal migrant (rural-to-rural migration) source districts of Amhara Region namely East Dembia, West Dembia, and Wogera (Adugna, 2019). Wogera district is located 36 kms from Gondar town and 763 kms from Addis Ababa, elevated at an average altitude of 2,812m above sea level. It is found at between 37.36ºE and 12.460N longitude. The annual rainfall ranges between 1000 mm to 1200 mm, and the minimum and maximum mean temperature of the study area is 14oC and 330C, respectively (Derbe et al., 2018). According to the district agricultural office report (2016) cited in (Derbe et al., 2018), the total population of the district was 268,833 of which 131,776 were females. While, East Dembia and West Dembia districts are located 35 kms and 50 kms from Gondar town and 775 and 790 kms from Addis Ababa,

respectively. It is found between 37.2544ºE and 12.4099ºN longitude and the altitude ranges from 1700 to 2700 meter above sea level. The annual rainfall of the area ranges 772mm and 1160mm, and the maximum and minimum temperature is 290C and 11.8oC, respectively (Yonas et al., 2018). According to the district agriculture office report (2015) cited in (Yonas et al., 2018), the total population of the district was 321,198.

The study used both quantitative and qualitative approaches to assess how social vulnerability is conceived in the local circumstances. A two-stage sampling procedures were employed. At first, sampled districts were selected due to high seasonal rural-to-rural migration source in Amhara Region. The associated recurrent occurrences of some natural risks like drought and their impact on smallholder household's livelihood were also considered. Next, six representative kebeles (two in each district) were selected using the practice of movement of people from their residence to other areas in search of livelihood income. Then, a list of the households in the selected rural kebeles were categorized into two groups (migrant-sending and non-migrant households) for the selection of the sample households. Finally, sample of 188 households was selected using a systematic random sampling technique of which 59% (111) were migrant sending and the rest 41% (77) non-migrant households.

Household survey was undertaken to collect primary data on the households socio-economic and demographic characteristics, livelihood portfolios, coping strategies, natural risk, and household vulnerability related issues with indicators between January-May 2019 using structured interview schedule. It was supplemented by qualitative information gathered through 20 key informants' and two focused group discussion using KII and FGD guides on the basis of the knowledge of peoples about the area and who have the first-hand experience of migration. Secondary data were also obtained from reviewing relevant published and unpublished documents.

Data obtained from household survey were encoded to STATA ver. 14 for statistical analysis. Descriptive statistics were employed to describe the socio-economic characteristics of households. Inferential statistics like Chi-square was employed to test the significant differences of variables between migrant-sending households (in this study; the household that has a member of household who had been living in the seasonal rural-to-rural migration destination areas for a minimum of three consecutive months (Kuschminder et al., 2018; Marie et al., 2018)) and non-migrant households. Multivariate principal component analysis (PCA) was applied to compute the social vulnerability index (SVI).

Measurement of Social vulnerability

Social vulnerability, focus of this study, is a function of exposure to risk and sensitivity (Adger, 2006), considered assets, technologies, knowledge, and other contextual factors and what their consequences are for change (Leichenko & O'Brien, 2008). Asset accumulation (Redehegn et al., 2019), improved markets, infrastructures, and access to savings reduce the vulnerability of the poor to shocks via promoting social and political cohesion (Ehui et al., 2002; Ignacio, 2010). The households will suffer disproportionally following a damaging event, depending up on variations towards access to resources and information, the ability to absorb the impacts, housing choice and location, and the level of political marginalization (Cutter et al., 2003).

The multitude dimensions of social vulnerability (Mazziotta & Pareto, 2019) requires the construction of the social Vulnerability Index to capture the multiplicity of its aspects (Alinovi et al., 2010) such as measures of shocks, wellbeing indicators and identifying determinants of vulnerability (Davies et al., 2014). Based on the extensive literature re-

view (Ciani, 2012; Deressa et al., 2008; Dumenu & Obeng, 2016; Ge et al., 2017; Tessema & Simane, 2019), the measure of household social vulnerability to migration in this study was obtained by applying PCA on the most important measurable socio-economic, and exposure to risk indicators (Dharmawardena et al., 2015). It is because, PCA is frequently being employed to construct indices for which there are no well-defined weights for the measurements of indices (Goncalves & Zezere, 2018; Mavhura et al., 2017; Rusinamhodzi et al., 2012). However, indicators were standardized to avoid measurement unit biasedness and ease of analysis, (using the basic formula equ. 1) (Cutter et al., 2003; Mello, 2016; Sharp, 2003). Then, ten main indicators were generated from selected 38 variables or sub indicators such as access of infrastructure index, agricultural technology index, social network index, risk exposure index, financial asset index, human asset index, access of productive land index, livelihood diversity, crop diversity and food shortage. Following that the variables were combined and analyzed to construct the SVI with the help of PCA. The Kaiser criterion (eigenvalues > 1) was employed for the component identification and confirmed (kmo =0.5755) the appropriateness of the indicators to the PCA (kmo>.5) as shown in table 2 (Field, 2005).

$$Indexsv = \frac{Si - Smin}{Smax - Smin} \quad \ldots\ldots 1$$

Where Indexsv = standardized value of each indicators, Si = the actual value each indicator for the respective factors of social vulnerability; Smin and Smax = minimum and maximum value respectively for each indicator.

Results and Discussion

Characteristics of the sampled households

SSex of the household head (HH) is an important variable influencing the migration of household members. About 81.4% of households were male headed while the remaining 18.6% were female headed. The majority of (77.5%) migrant-sending households were male headed households and 22.52% of were female headed household. Likewise, the non-migrant households dominated by male headed households; 87% and 12.99% of non-migrant households were male and female headed households, respectively.

Regarding to family size; the number of people living in a household, the average family size of migrant sending and non-migrant households were estimated at 6.84, and 6.65, respectively, which is higher than the national figure 4.6 (CSA & ICF, 2016). The mean age of the household was estimated at 50.27 years; 50.65 for migrants sending and 49.73 for non-migrants households. Concerning the educational status of HHs, more than half of them (61.7%) were unable to read and write; 65.77% of migrant sending and 55.84% of non-migrant households.

Livestock ownership of the households is one of the basic economic activities and asset accumulation (Derbe, 2020; Derbe et al., 2018). Livestock rearing are practiced for different purpose such as to produce animal products, drought power, generate income, means of transport, and produce animal dung for organic fertilizer and domestic energy consumption. The average livestock ownership of the households in terms of tropical livestock unit were estimated at 6.55 TLU; 6.33 TLU for migrant sending households and 6.87 TLU for non-migrant households (table 1). The livestock endowment of the area is much greater than the national 2 TLU (FAO, 2018). Land holding is also the other vital base of the household's economic diversification. The mean landholding that used for crop cultivation, homestead, grazing of the sampled households estimated

at 1.6 hectare; 1.49 hectare for migrant sending and 1.76 for non-migrant households. The household's landholding of the study area is also higher than the national average land holding, which is 1.06 hectare (CSA, 2016). The above information infers that the area has a better resource endowment compared to the national average endowment.

Table 1. Socio-economic and household characteristics of sampled households

Categorical Variables		**Migrant-sending**		**Non-migrant**		**Total**	
		Freq.	Percentage	Freq.	Percentage	Freq.	Percentage
Sex of HH	Male	86	77.5	67	87	153	81.4
	Female	25	22.52	10	12.99	35	18.6
Education level of HH	Literate	38	34.23	34	44.16	72	38.3
	Illiterate	73	65.77	43	55.84	116	61.7
Continuous variables		Min/max	Mean	Min/max	Mean	Min/ max	Mean
Family size		2/13	6.84	1/16	6.65	1/16	6.76
Age of HH		22/81	50.65	20/81	49.73	20/81	50.27
TLU		0/39.85	6.33	0/18.54	6.87	0/39.85	6.55
Landholding		0/4	1.49	.25/3.5	1.76	0/4	1.6

Social vulnerability

The result of PCA produced four components and explained 62.69% of the total cumulative variance in social vulnerability. Component one, two, three and four were explaining 19.84%, 17.13%, 14.7% and 11.02% of the variations in the data, respectively. A complained SVI score was generated by adding all four component scores (factor loadings), and adjusted to the scale of 0 (minimum) to 1 (maximum), value (Mello, 2016). Finally, the SVI scores were classified into five classes (Goncalves & Zezere, 2018; Mavhura et al., 2017) to see the social venerability level of the study households as shown in table 3.

Table 2. Rotated factor loadings (pattern matrix) and variances

Variable	Comp1	Comp2	Comp3	Comp4	Unexplained
Infrustructure index	-0.14	0.3208	-0.1241	0.451	0.5483
Agricultural technology index	0.0464	-0.0665	0.0167	0.7364	0.3739
Social network index	0.3064	-0.3131	0.2654	0.2455	0.3744
Risk exposure index	0.0792	0.6659	-0.0086	0.0067	0.2434
Financial asset index	0.2785	0.1619	0.5524	0.1487	0.2436
Human asset index	0.3997	-0.0418	-0.0005	-0.3743	0.5857
Access of productive land index	0.5191	0.3834	-0.0825	-0.0077	0.2836
Livelihood diversity	-0.1449	-0.0993	0.6937	-0.0684	0.2801
Crop diversity	0.5375	-0.0977	-0.0443	0.0289	0.395
Food shortage	-0.2476	0.3961	0.3445	-0.1617	0.4035
Eigen Value	2.15434	1.6878	1.37921	1.04716	
Proportion of variance	0.1984	0.1713	0.1470	0.1102	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy				0.5755	

The result showed variations in the vulnerability of the households in the study area (table 3). The results of PCA analysis revealed that 15.32% and 21.63% of migrant sending households are very highly and highly vulnerable households, respectively. However, 25.97% and 29.87% of non-migrant households are very highly and highly vulnerable households, respectively. This indicates that migrant sending households were less vulnerable than non-migrant households. The chi-square results also confirmed that the difference is statistically significant (X2=9.0823; p<05). This revealed that migration is the vulnerability reduction strategy in the area.

Hence the migrant sending households have diversified income sources and better food access (Figure 1.). The results of KII and FGDs also confirmed that the migration in the study area increased the household's livelihood diversity (Zeleke et al., 2008), and reduced the food shortage in the migrant sending households (Redehegn et al., 2019). This was particularly true during the high food shortage season of Jun – October, and during the crop failure (Ayele & Degefa, 2020; Mihret, 2010). This would also imply that rural-to-rural migration is one of an adaptation mechanism and survival strategy during the occurrences of shocks or stresses (Fransen & Kuschminder, 2009; Mberu, 2006) of the households in the study area. Similarly, it improves the adaptive capacity and well-being of households (Admassie et al., 2017; Birhan, 2011; Brauw et al., 2012; Teshome & Belete, 2017), and reduces the households' vulnerability and poverty (Blunch & Laderchi, 2015) in the face of unexpected natural events.

Table 3. Social vulnerability status of migrant sending and non-migrant households (N = 188)

Vulnerability level	**Migrant sending (n=111)**		**Non-Migrant (n=77)**		**Total**		**X^2 test**
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**	
Very low vulnerable (0-0.2	5	4.5	3	3.90	8	4.26	9.0823** (p<05)
Low vulnerable (0.200001-0.4)	17	15.32	13	16.88	30	15.96	
Moderately vulnerable (0.400001-0.6)	48	43.24	18	23.38	66	35.11	
Highly vulnerable (0.600001-0.8)	24	21.62	23	29.87	47	25	
Very highly vulnerable (0.800001-1)	17	15.32	20	25.97	37	19.68	

** significant at 5% (p<0.05)
Source: Own Survey Computation

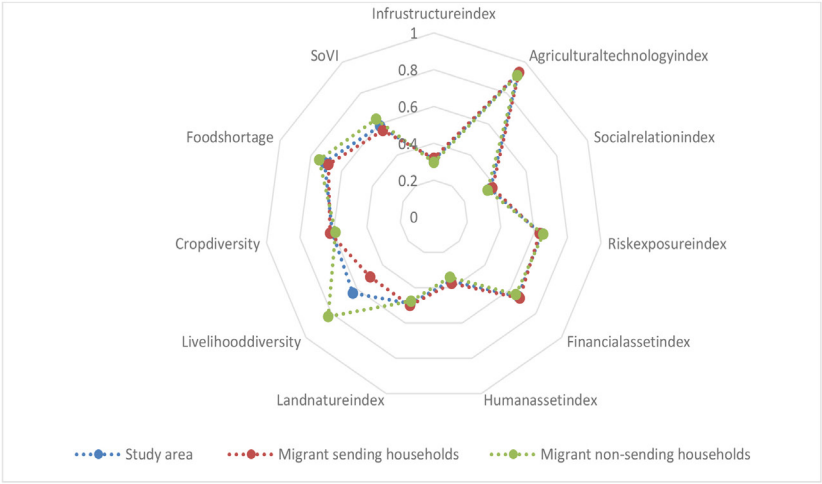

Figure 1. Mean Social Vulnerability Indicators weight of the sample households and study area

Conclusion

Besides the prevalence of subsistence agriculture in the Northwest Ethiopia, seasonal rural–to-rural migration becomes a common trend by smallholder farming households as alternative livelihood improvement strategy. The findings of this study confirmed that migration increase the household's income sources and reduces the food shortage in the migrant sending households. It has also an immense contribution to poverty reduction among migrant sending households in the study area. Therefore, attention by various stakeholder is important on seasonal rural-to-rural migration is needed to improve the livelihood contribution of migration for migrant sending households. A detailed assessment of migrant's attitude, satisfaction, challenges on the process and at the destination area; and the migrant's overall impact in the destination areas are required.

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