

# Climate Change Resilience through Migration: A Case of Pakistan\*

Kashif Salik, Ayesha Qaisrani, Muhammad Awais Umar, Rana Junaid Zahid, Syed Mohsin Ali Kazmi, Ayesha Qaisrani

## Abstract

*This study assesses the role of rural to urban migration in enhancing livelihoods resilience and introducing new economic opportunities in semi-arid regions of Pakistan. Pakistan has a considerably high urbanisation rate with estimates from 2010 to 2015 averaging between 2.8 to 3.3 percent annually, thereby transforming the demography of certain areas, especially semi-arid regions which include 'migration hotspot' areas. The authors developed a Livelihood Resilience Index comparing the resilience levels of migrant and non-migrant households. Data was collected at the household level, comprising of a sample of 600 households in three semi-arid regions of Pakistan (D.G.Khan, Faisalabad and Mardan).*

*From the results, the authors conclude that migration has the potential to strengthen livelihood opportunities, social and human capital and the overall level of resilience among households.*

*Therefore, it is likely to be a successful adaptation strategy to climate change and other external shocks. However, it does not imply that merely facilitating migration would be a viable option for enhancing resilience. The way remittances are used has a significant contribution to the resilience of a household.*

*The authors' findings call for a policy-mix that promotes the positive impacts of rural-urban migration, while staying cautious of the adverse impacts. Efforts are needed to attract remittances towards strategic development sectors with potential for improving livelihoods and production, thereby enhancing peoples' resilience.*

---

*This chapter has been approved as a Working Paper by the referee. This study is a research product under the project 'Migration Futures in Asia and Africa: Climate Change and Climate Resilient Economic Development' which is part of a multi-country consortium named 'Pathways to Resilience in Semi-Arid Economies (PRISE)'. The project is funded by Department of International Development (DFID, Government of UK) and International Development Research Centre (IDRC, Canada). It is a first in a series that explores the potential of migration in enhancing livelihood resilience by serving as an effective adaptation strategy.*

*\*\* Mr Kashif Salik is a Senior Research Associate at the Sustainable Development Policy Institute (SDPI) in Islamabad, Pakistan. He is currently a PhD scholar at the University of Southampton, UK. Ms Ayesha Qaisrani is a Research Associate, Mr Muhammad Awais Umar is a Project Assistant and Mr Syed Mohsin Ali works as the Senior Data Manager at SDPI.*

## **Introduction**

The fifth assessment report of Intergovernmental Panel on Climate Change (IPCC) raised the level of confidence on (irreversible) impacts of climate change on natural and human systems (IPCC 2014). The slow rise in temperature and variability in rainfall may cause severe negative impacts on crop yields and shifts in high agriculture productive lands into less fertile, that reduce farm incomes and jobs as well as food security in rural areas (Ibid.). There is emerging evidence that such persistent shifts in climate and increased frequency of extreme weather impacts are driving people out of their habitats and pushing them to migrate (Myers 2005; Parry 2007; Saeed et al. 2016). A study on Pakistan by Mueller et al. (2014) concludes that extreme high temperature during winter season caused about one-third decline in wheat yields. As a result, the landless agricultural labour opts to migrate to other villages or urban areas subject to the availability of socioeconomic assets. As most rural population, including poor and landless rural labour, resides in these agricultural lands, many may be persuaded to migrate owing to declining agricultural yields (Saeed et al. 2016). Migration provides them the opportunity to spread risks and diversify livelihoods by taking migration-as-adaptation option (Scheffran et al. 2011). Such migration flows due to climate change are mostly internal or within the country (ADB 2012), where migrants expand their social networks, gain capabilities and improve social and human capital essential for complete family migration and livelihood expansion (Scheffran et al. 2011).

Under this backdrop, there is a need to empirically test whether migration can serve as an efficient adaptation strategy by building the resilience of the migrant households. This study focuses on the state of the resilience of migrant and non-migrant rural households in the context of Pakistan. The study tried to look into what role migration can play in enhancing new economic opportunities (taking into account distributional effects, especially for the poor and women) for improving resilience in semi-arid lands of Pakistan.

## **Migration and Rural Areas: The Socioeconomic Context**

In Pakistan, poverty is largely a rural phenomenon. Latest estimates provided by the Government of Pakistan (Ministry of Planning, Development and Reform 2016) show that about 39 percent of the population of Pakistan is facing multidimensional poverty. There is a stark contrast between urban and rural incidence of poverty: urban poverty is about 9.3 percent, whereas rural poverty is estimated to be about 54.6 percent (Ibid.). On average, rural incomes in Pakistan are 38 percent less than urban incomes based on the estimates of 2013-14 (PBS 2015), while estimates of multidimensional poverty show that about 48 percent people in rural areas are deprived in contrast to 18 percent multidimensional poverty rate in urban areas (SDPI 2012). Agriculture remains pivotal in affecting the rural economy and living standards on the rural side.

A number of studies have attempted to understand the dynamics of rural poverty and well-being of the rural population for the case of Pakistan. Ali (2011) focused on studying the underlying forces behind rural poverty in Punjab and compared different divisions of the province for their poverty trends. He found that northern and central Punjab has relatively less incidence of poverty as compared to southern and western Punjab and rural poverty was

found to be twice the urban poverty rate. Clear depictions of poverty pockets could be observed with the analysis, necessitating the need for area-specific policy packages for alleviating rural poverty in these pockets. Qazi et al. (1997) stated that to some extent, the incidence of poverty in different regions of Pakistan is related to water availability. Areas outside the Indus Basin which include *Barani* lands, *Rod-kohi* areas, *Sailaba*, deserts, coastal areas, etc., tend to be poorer than regions within the Indus Basin.

People living in rural areas are facing a low living standard as compared to urban areas and they continue to suffer from the lack of availability of education and health facilities, safe drinking water and sanitation along with other social services and physical infrastructure (Rahman 2011). The rural population of Pakistan has decreased from 67.9 percent in 1996 to 60.8 percent in 2015; on the other hand, the urban population has increased from 32.1 percent in 1996 to 39.2 percent in 2015 (Hussain 2014). Structural transformation in the economy is driving people towards cities - resources are reallocated from low productive (agriculture) to high productive (industry and service) sectors (Ibid.). The productivity of agriculture sector has declined because of high input prices, water shortage, natural events (flood, heavy rain and drought), which reduces the earnings of the rural population (State Bank of Pakistan 2015).

The role of migration is widely acknowledged globally as a 'positive force' or 'key intervening apparatus' for development, a way for reducing inequalities and poverty (Raghuram 2009; Bakewell 2007). Some consider migration as an important poverty reducing strategy, while others regard it as a reason for increasing poverty in urban and rural areas. The former view relates poverty reduction to the inflow of remittances that supplement rural incomes and contribute to the rural economy by increasing consumption, expenditure on social sector and household savings (IOM 2005). Conversely, other studies exploring the links between poverty and migration recognise that the poorest often cannot afford to migrate (Hear et al. 2012).

Migration patterns in Pakistan indicate a predominant poverty-migration linkage (Gazdar 2005), however, the links between migration and poverty are neither linear nor simple (Deshingkar and Sven 2005). Rural areas are undergoing rapid socioeconomic transition and internal migration is undeniably an important contributor to this change (Marshall and Rahman 2012). However, on the research front, internal migration appears to be less visible, possibly because it is less recorded as compared to international migration (IOM 2005).

### **Analytical Framework, Data and Methodology**

This research follows Tanner et al.'s (2014: 23) definition of livelihood resilience which explains it as 'the capacity of all people across generations to sustain and improve their livelihood opportunities and well-being despite environmental, economic, social and political disturbances'. To estimate livelihood resilience, this study uses the conceptual framework developed by Bahadur et al. (2015) and Tanner et al. (2014). The framework allowed to look into three important aspects of livelihood resilience: (1) Adaptive capacity – 'the ability of social systems to adapt to multiple, long-term and future climate change risks,

and also to learn and adjust after a disaster' (Bahadur et al. 2015:13); (2) Anticipatory capacity – 'the ability of social systems to anticipate and reduce the impact of climate variability extremes through preparedness and planning capacities' (Ibid.:23); and (3) Absorptive capacity – 'the ability of social systems to absorb and cope with the impacts of climate variability and extremes' (Ibid.:30). This framework allowed an *ex-ante* context of livelihood vulnerabilities, coping strategies and community's economic opportunities and well-being (Ibid.).

This study focused on two districts of Punjab and one district of Khyber Pakhtunkhwa (KPK) provinces of Pakistan i.e. Dera Ghazi Khan, Faisalabad, and Mardan. These districts are located in semi-arid regions of the country and constitute largely of agro-based livelihoods. The district of Dera Ghazi Khan was selected mainly because it is a rural district with around 86 percent of the total 1.6 million population living in rural areas (PBS 2014). The district is also the least developed area within the province with one of the highest incidence of multidimensional poverty (Naveed and Ali 2012). The livelihood of majority population is directly related to agriculture sector, while a considerable dependence on remittances is also observed. Further, the district has a dry semi-arid climate having very little rainfall (220mm/year) (Government of Punjab 2015) and is highly vulnerable during the monsoon period to floods and inundation by Indus River resulting in soil erosion and large-scale crop damages. For the remaining year, there is a drought-like condition, especially for the rainfed areas of the district, which often pushes the poverty-trodden people towards canal-irrigated areas as well as other parts of the country in search of food, drinking water, fodder and better economic opportunities (Qaisrani 2015).

The selection of district Faisalabad as the second study site is based on its diverse economic activities including both agriculture and large industrial sector (ASER 2008). This enables one to study migration phenomenon and resilience potential under different contexts of development. The district of Faisalabad has two key limiting factors to its development: firstly, its brackish ground water which is unsuitable not only for human consumption but also for many industrial processes such as dyeing and tanning as well as for crops and livestock production. This has increased many dependencies on surface water supplies through irrigated canals, which are highly challenging due to variable and declining river flows and increasing water demand by different sectors (Irfan et al. 2014). Surface water is primarily used for agricultural purposes only. Secondly, the climate of the district is dry semi-arid and characterised by erratic rainfall and increasing heat waves (Saeed et al. 2016) resulting in increasing incidence of agricultural droughts, frequent crop failures and drop in crop (especially wheat) productivity (Mueller et al. 2014). According to Farooq et al. (2005), this has caused an increase in rural-to-urban migration in Faisalabad district, which is already affected by other factors such as low-paying jobs and lack of economic opportunities in the rural areas, scarcity of agricultural land and social discrimination to rural poor and landless communities.

The third site is district Mardan, which is the second most populous district after Peshawar (the provincial capital city) in the Khyber Pakhtunkhwa province of Pakistan. With an estimated 2.3 million population, the district has 20.2 percent urban population, leaving the

majority residing in rural areas (USAID 2009). The authors selected this site because agriculture sector (which is largely based on the production of wheat, sugarcane, and tobacco) is highly vulnerable to climate variability and declining water for irrigation (Saeed et al. 2016). This has induced the rural population to migrate over the years.

A survey was conducted using a structured household questionnaire (n=600; and n=200 for each site). Multi-level sampling techniques were used. First, within the district, purposive sampling was used to select two union councils that were farthest from the district capital. Within the union council, two villages were randomly selected. Selection of households from within the villages was stratified based on the nature of livelihood i.e. landless, small landholders (farm size less than 12.5 acres), large landholders (farm-size more than 12.5 acres) and non-farm households. Although 'sampling error' cannot be avoided, it can be reduced by obtaining a sample of sufficiently large size and by using an 'appropriate sampling technique'. An appropriate sample size of 600 was calculated (200 from each district). Sample size is calculated on the basis of following factors: Level of Significance, which describes the level of uncertainty in the sample mean or prevalence as an estimate of the population mean or prevalence, will be 95 percent; Margin Of Error (MOE) indicates the expected half-width of the confidence interval. The smaller the MOE, larger the sample size needed. For this project it is 0.05, which makes it 5 percent of the total population. Baseline Levels of Indicators (BLI) elaborate the estimated prevalence of the risk factors within the target population. Values closest to 50 percent are the most conservative, so in this study it is 0.5. Design Effect (Deff) describes the loss of sampling efficiency due to using a complex sample design, in this study it is 1.0. Selection of the sample size is also based on variation in target population (based on secondary population); available resources for this study (calculated in budget portion) and time frame.

The questionnaire was pre-tested (n=30) for the purpose of its flow and refinement at the local level. Migrant households are defined as those households in which at least one member of the household lives away from home for more than three months and who has strong ties with the household (through remittances, transfer of knowledge and information or visits to the rural household, etc.).

The study follows the procedure coined by Cutter et al. (2010) for constructing the resilience index for migrant and non-migrant households. The authors used a comparative approach and utilised proxy variables for the construction of the Resilience Index. A careful review of literature helped in selecting proxy variables for each of the sub-component of the resilience index (references have been provided in Annex 1). Since research based on resilience indices for migrants and non-migrants is still in infancy, selection of variables is ad-hoc in most studies, considering the multifaceted nature of resilience. Comparing the Resilience Index of both migrants and non-migrants is not a straightforward method. It is important to validate that resilience of the sample of migrant households and non-migrant households is, in fact, comparable. In case of two groups, which are fundamentally different from each other, indicating that resilience is a linear function of migration cannot be directly justified. Therefore, it is important to understand the underlying factors that may differentiate between the two groups, in order to comprehend the differences in resilience.

For this purpose, firstly, a Wealth Index was developed by using Principal Component Analysis (PCA). Wealth Index is an economic indicator which is constructed using household asset items such as households' ownership of different durable consumer products i.e. car, television, washing machine, tractor, etc., and assets i.e. type of house, access to water, access to electricity, etc. In other words, a Wealth Index determines the living standard of people and divides them into wealth quintiles. It provided five categories (i.e. Very Poor to Very Rich) of both migrant and non-migrants and these categories are merged to form three categories out of those five (i.e. Poor to Rich). This technique provided three homogenous groups of the selected population. Finally, the resilience of migrants and non-migrants was compared by considering the homogeneity of the selected population.

### **Results of Resilience Index**

The results of Resilience Index for migrant and non-migrant households are shown below in Table 1. The indicators included in each category are provided in Annex 2. This Resilience Index consists of three major components: adaptive capacity, anticipatory capacity and absorptive capacity, each component further divided into sub-components. The results show that migrant households are comparatively better off than the non-migrants in all three major components. Migration is known as an important approach for adaptation if society faces disparities in economic opportunities, political and environmental conditions (Waldinger 2015). According to the results, migrant households are more resilient, show more adaptability to any shock because they generally have a higher level of income, lower dependency ratio, diversified income sources and higher population of employees. Despite the fact that migrant households have a high rate of agricultural and livestock ownership, the rate of dependency for livelihood on agriculture is higher in non-migrant households. The higher response on the percentage use of water for irrigation by the non-migrants represents their dependency on agriculture for employment or livelihood. Along with this, the lower percentage of income diversification of non-migrants indicates the lack of economic opportunities or their reliance on a single sector (agriculture or livestock) for livelihood. Non-migrant households are less resilient because of their largely single sector dependency and a higher percentage of non-commercial use of agricultural products.

The scores of the anticipatory capacity component reveal that migrants have the ability to deal with problems much more easily than non-migrants. Generally, migrants take decisions about their life more freely, have more opportunities to learn new things and show their capabilities. Migrant households are more resilient than non-migrants because they have better future planning, understanding of the climate change impacts, better strategies to cope with food security situation and access to the media, which enhance their capacity to anticipate any upcoming extreme events. Migrants are perceived to have the opportunities to reduce vulnerabilities and contribute to enhancing the resilience of their communities of origin by creating new diversified livelihood sources, having information, knowledge, and understanding to mitigate hazards (Warn and Adamo 2014). In most developing countries, migration is considered an important strategy for risk management to deal with shock or stressor (Waldinger 2015).

Similar to the aforementioned results, migrants have the advantage to efficiently absorb external shocks or stressors as compared to non-migrants. Most of the non-migrants in this survey lived under the poverty line and took formal or informal loans to fulfil their basic needs. On the other hand, the trend of taking loans is lower in migrant households and most of the time they took a loan for investment purpose to improve livelihoods. They also have more advantage of substituting water sources for drinking and domestic purposes. Remittances are the plus point for migrants that help to improve their livelihood and enhance their capacity to absorb any shock. Remittances provide an opportunity to the recipients to invest in the capital stock, enable them to deal with food insecurity, improve their education and lifestyle. Study findings reveal that migrants have a high percentage of real estate / financial property, agriculture land, and livestock ownership, they have more population above the poverty line and are more food secure.

It is clear from the above discussion that migrant households are more resilient to any shock or stressor as compared to non-migrants: their resilient score is comparatively higher than non-migrants. Thus, it indicates that migration has been a viable strategy to cope with any shock or stressor (climatic or non-climatic) (Sallu et al. 2014). In practice, accrediting higher resilience to migration may come off as a little too straightforward. It may be argued that migrant households may already be more resilient than non-migrant households prior to migration and that this difference in resilience may come from other socioeconomic and behavioural discrepancies. In such a case, migration may not be considered a contributing factor to resilience, rather an outcome of already-possessed higher levels of resilience in some households.

To consider this aspect, the authors have constructed the Wealth Index to divide the population into three homogeneous groups based on the differences in their wealth status. Following that, they calculated Resilience Index of migrants and non-migrants for all income groups drawn from the Wealth Index. The results in Table 2 represent that migrant and non-migrant households are following the same trend of resilience (migrants are more resilient as compared to non-migrants) regardless of their wealth status. On the other hand, richer population has higher resilience score as compared to middle-income group, and the middle-income group has a higher score than that of the poor population.

**Table 1: Resilience Index Scores of Migrant and Non-migrant Households in Semi-arid Regions of Pakistan**

Livelihood Resilience/ Determinants	Migrant Score	Non-Migrant Score
<b>Adaptive Capacity</b>		
Assets, access, income and food security	0.526	0.462
Strengthening and adapting livelihoods	0.467	0.401
<b>Anticipatory Capacity</b>		
Preparedness and planning	0.526	0.452
Capacity, information, and mobilisation	0.589	0.536
<b>Absorptive Capacity</b>		
Saving and safety nets	0.504	0.470
Substitutable and diverse assets and resources	0.211	0.146
<b>Resilience Index Score (Sum of Adaptive, Anticipatory and Absorptive Capacities)</b>	<b>2.822</b>	<b>2.467</b>

*Source:* Based on structured questionnaire interview of 600 respondents in D.G. Khan, Faisalabad, and Mardan conducted during February 2016.

**Table 2: Resilience of Migrant and Non-migrant Households with Respect to Wealth**

Categories by Wealth and Migration Status		Resilience Score	Adaptive Capacity	Anticipatory Capacity	Absorptive Capacity
Poor	Migrant	2.301	0.816	0.948	0.537
	Non-Migrant	2.003	0.717	0.820	0.466
Middle	Migrant	2.780	0.999	1.077	0.704
	Non-Migrant	2.607	0.890	1.035	0.683
Rich	Migrant	3.299	1.181	1.252	0.866
	Non-Migrant	3.052	1.115	1.170	0.768

*Source:* Based on structured questionnaire interviews of 600 respondents in D.G. Khan, Faisalabad, and Mardan conducted during February 2016.

## Discussion of Results

The study estimated the livelihood resilience in semi-arid regions of Pakistan to test the hypothesis: does improving resilience through migration movements aspire to encourage adaptation (to climate change) as well as to boost economic opportunities? Or does migration prove to be a maladaptive strategy that results in socioeconomic deprivation for the left-over family members (including poor and vulnerable, women, elderly people and others) who are unable to work or participate in productive activities? It was found that migration movements critically strengthen the livelihoods opportunities, social and human capital and overall resilience in out-migration regions. This research also concludes that there is a positive role of migration in improving the resilience of migrant's left-over families through better living standards, access to resources, and higher potential to utilise remittances for productive purposes.

Adaptive capacities are essential to sustain and improve livelihood strategies against any social, economic, political and environmental stresses (Tanner et al. 2014) as well as to learn and the ability to the change in behaviour after a disaster (Scheffran et al. 2011; Jones et al. 2010). The study found a strong association between migration and increase in adaptive capacities of rural areas. It is concluded that migrant families are more capable of gathering livelihood assets, improving incomes and ensure food security than non-migrants families.

Better resilience can further be achieved through anticipatory capacities that refer to the ability to prepare and plan pro-actively for an upcoming stress (Boyd et al. 2009). It requires predictive capacities, knowledge, skills and experience (Folke 2006) to explain the notion of anticipatory capacity (Tschakert and Dietrick 2010). Study analysis suggests that anticipatory capacities of migrant households are better as compared to non-migrants households. They are more capable of anticipating through learning new skills, better social networks to deal with issues, access to information and understand ways to mitigate risks and hazards.

Resilience also requires enhancing absorptive capacity which is the ability to absorb and cope (during and after) with the impacts of disturbances (OECD 2014). Similarly, Béné et al. (2012) explain absorptive capacity in terms of 'persistence and stability' influenced by supportive economic resources such as asset holdings and savings, as well as links to informal safety nets and social capital (Starr and Tabaj 2015). The absorptive capacity index score indicates that migrant households have better access to financial resources and more alternative options than non-migrant households. Migration diversifies household assets and human capital that result in better housing and living standard, access to health facilities and transport, etc., essential for appropriate response to any shock or stress.

However, understanding resilience in societies with varying social, economic and cultural values is challenging. Tanner et al. (2014) raised an important concern: 'resilience of what type, for whom'? Resilience is a concept about the system's capacity to 'bounce back' to its original conditions. What if these previous circumstances are 'undesirable', people may be locked in poverty, injustice, inequality and discriminations (Ibid.). In other words, resilience (especially for poor and marginalised) needs to be redefined and there is a need to develop consensus on 'desired states' (Ibid.). For example, migration occurs in the state of inequalities as it is beneficial for those who were previously well-off and would only help them to build resilience, leaving behind poor and marginalised worse off (Lipton 1980). This study was carried out under this limitation and only presents the *ex-ante* perspective of resilience with respect to migration. A focus to incorporate transformational aspects of resilience with some thinking on desired states of adaptation essential to respond climate change impacts is needed to fill the gap in the future.

Migration is a normal social aspect of human life emerging from the historical and current patterns of inequality in development among regions, poverty and unemployment, human insecurity, disparities in living standards and discrimination embodied within and across societies of origin and destination (Castles 2010, 2013; Hear, Bakewell and Long 2012; Adepoju 1998; King and Skeldon 2010). The results from the authors' three case studies

show similar causes of migration. Most of the migrants moved from areas of origin because of the extremely low wage rates and lack of work opportunities in the villages as they find better job opportunities in the cities. Some other factors are considered important such as lack of quality education and health services in rural areas; and adverse environmental or climatic factors. These reasons for migration indicate that the agriculture sector of Pakistan, in general, has struggled to provide enough opportunities to rural communities and pushed them to look for opportunities elsewhere. The growth in agriculture sector in Pakistan slowed drastically since the 1980s and its share to Gross Domestic Product declined to 21 percent in 2014 from 49 percent in 1951 (Salik et al. 2015; Zaheer 2013). Given the lack of support of the government in the agriculture sector, the decline in agricultural productivity is mainly due to the lack of water for irrigation; high input prices; frequent heavy and abrupt rainfalls and recurrent floods; soil salinization and seepage, etc. Most migrant families indicate that staying in the agricultural profession could not yield enough benefits for their families. It is evident from the fact that in the study areas, majority of the small to medium farmers do subsistence agriculture and have nothing or very less to sell in the market. The majority of the rural households have faced high food insecurity situations for many months in a year. In order to spread the risk of food insecurity, the youth in rural areas finds no incentive to stay and decides to migrate for better and stable livelihoods in the cities.

Evidence suggested that in the study areas, remittances are mostly used for household consumption and spent on food, health, weddings, education, repaying debts, etc. and, less on investment for expanding livelihoods or other productive purposes. For example, from all income groups, up to 80 percent of migrant families are receiving remittances that constitute 50 percent or even more of their monthly household income. This also highlighted the contribution of remittances in the reduction of rural poverty in the study areas. Nevertheless, remittances have also been used for the purpose of investment in advanced agricultural practices and agro-based businesses by the return migrants in the authors' study areas that have boosted local industry and growth.

The debate on migration and its effects on inequality are varied and inconclusive (Black et al. 2005). When considering the context and selectivity of migration, literature indicates that inequality of any kind (such as in income, social order, access to opportunities, gender, or lifestyle) can generate specific type of migration (internal or international; short distance or long distance, etc.) and define migrants work and benefits (Lipton 1980; de Haan 1999). Because migration involves risks and costs, the poorest people are less likely to migrate (Black et al. 2005). This study showed similar inequalities, as the majority of non-migrants are willing to migrate (at least one member of the household) within the country to improve livelihoods if they are able to manage the financial resources up to PKR 100,000 (USD 1000). This willingness to migrate is more common among the landless, small landholders and non-farm poor households. However, within the current migrant households, migration is also common among rural poor and landless farmers at least over a short distance to work in nearby factories as labourers.

Many scholars argue that migration and inequality outcomes need to be looked at in the wider spectrum of political, economic and social-cultural institutional perspectives, rather

than only in terms of income or wealth outcomes (Black et al. 2005; de Haas 2006). The role of formal and informal networks in sharing the cost and risks of migration especially for marginalised groups are critical in reducing initial level of inequalities and poverty in both migrations sending and receiving regions (Ibid.). This study also suggests that social networks and advice from relatives and friends played an important role in the decision to migrate. In conclusion, this research found a positive role of migration in improving the socioeconomic conditions of rural households, such as reduction in overall poverty, securing livelihoods, and improving opportunities for household development and growth.

## **Conclusion**

This study provides an assessment of the state of resilience of migrant and non-migrant rural households in the semi-arid regions of Pakistan. The authors used livelihood resilience framework and case study approach to answer some key questions about the role of migration in improving resilience in semi-arid lands of Pakistan. Further, the study tried to explain how migration can possibly be shaped as an adaptation strategy and its potential to introduce new economic opportunities through the role of remittances and return migration. It has been found that the major causes of internal migration in semi-arid regions are extremely low wage rate; lack of work opportunities, quality education and health services in rural areas; high food insecurity; and adverse environmental or climatic factors.

It is concluded that migration movements critically strengthen livelihood resilience in out-migration regions. The migrants are able to diversify livelihoods opportunities, reducing risks of income failure and able to expand social and human capital. Migrant families experience the positive outcome of migration by getting better living standards, access to resources, and higher potential to utilise remittances for productive purposes. Remittances are important to make livelihoods more secure, to reduce income uncertainty and to provide a source of new investment in land and property purposes. They can also help to reduce rural poverty in the study areas. Return migrants can invest in advanced agricultural practices and agro-based business. The research also found inequality in opportunities of migration in rural areas. The majority of non-migrants are willing to migrate internally (at least one member of the household) to improve livelihoods if they are able to manage the minimum financial resources essential to migrate.

Results of this study call on the government to revisit its approach of viewing rural-to-urban migration in a pessimistic context. Pakistan does not have an internal migration policy, however, the general concern of internal migration discourse has always called for measures to 'control' urban in-flows. The government should recognise the resilience-enhancing potential of migration rather than viewing it as a rapid urban agglomeration issue. Policy focus needs to promote the positive impacts of migration while considering the negative impacts.

## References

- ADB 2012, 'Addressing Climate Change and Migration in Asia and the Pacific', Manila: Asian Development Bank.
- Adepoju, A. 1998, 'Linkages Between Internal Andinternational Migration: The African Situation', *International Social Science Journal*, vol.50, no. 157, pp.387-395.
- Ali, A. 2011, 'An Analysis of the Spatial Dimension of Poverty in the Punjab', Unpublished M. Phil Dissertation, Islamabad: Pakistan Institute of Development Economics.
- ASER 2008, 'Annual Report on Faisalabad', The Annual Status of Education Report (ASER), Pakistan.
- Bahadur, A. Peters, K. Wilkinson, E. Pichon, F. Gray, K. and Tanner, T. 2015, 'The 3As: Tracking Resilience across BRACED', Working Paper, London: Overseas Development Institute.
- Bakewell, O. 2007, 'Keeping Them in their Place: The Ambivalent Relationship between Development and Migration in Africa', *Third World Quarterly*, vol. 29, no.7, pp.1341-1358.
- Béné, C. Wood, R. Newsham, A. and Davies, M. 2012, 'Resilience: New Utopia or New Tyranny? Reflection about the Potentials and Limits of the Concept of Resilience in relation to Vulnerability Reduction Programmes', Working Paper no. 405, UK: Institute of Development Studies.
- Black, R. Natali, C. and Skinner, J. 2005, 'Migration and Inequality', *Development Research Centre on Migration, Globalisation and Poverty*, Sussex: University of Sussex, pp. 1-26.
- Boyd, E. Grist, N. Juhola, S. and Nelson, V. 2009, 'Exploring Development Futures in a Changing Climate: Frontiers for Development Policy and Practice', *Development Policy Review*, vol. 27, no. 6, pp. 659-674.
- Brooks, N. and Adger, W. 2005, 'Assessing and Enhancing Adaptation Policy Framework for Climate Change: Developing Strategies, Policies and Measures', Cambridge University Press, pp. 165-181.
- Brown, K. 2011, 'Sustainable Adaptation: An Oxymoron?', *Climate and Development*, vol.3, pp. 21-31.
- Castles, S. 2013, 'The Forces Driving Global Migration', *Journal of Intercultural Studies*, vol.34, no. 2, pp.122-140.
- Castles, S. 2010, 'Understanding Global Migration: A Social Transformation Perspective', *Journal of Ethnic and Migration Studies*, vol. 36, no.10, pp. 1565-1586.

## Climate Change Resilience through Migration: A Case of Pakistan

Colten, C.E. and Kates, R.W. and Laska 2008, 'Community Resilience: Lessons from New Orleans and Hurricane Katrina', CARRI Research Report 3, Tennessee: Oak Ridge National Laboratory.

Cutter, S.L. Barnes, L. Berry, M. Burton, C. Evans, E. Tate, E. & Webb, J. 2008, 'A Place-Based Model for Understanding Community Resilience to Natural Disasters', *Global Environmental Change*, vol. 18, no. 4, pp.598-606.

Cutter, S. Burton, C. and Emrich, C. 2010, 'Disaster Resilience Indicators for Benchmarking Baseline Conditions', *Journal of Homeland Security and Emergency Management*, vol. 7, no. 1.

de Haan, A. 1999, 'Livelihood and Poverty: The Role of Migration-A Critical Review of the Migration Literature', *The Journal of Development Studies*, vol. 36, no. 2, pp. 1-47.

de Haan, A. and Rogaly, B. 2002, 'Introduction: Migrant Workers and their Role in Rural Change', *The Journal of Development Studies*, vol. 38, no. 5, pp. 1-14.

de Haas, H. 2006, 'Engaging Diasporas. How Governments and Development Agencies can Support Diaspora Involvement in the Development of their Origin Countries', Oxford: International Migration Institute (IMI), University of Oxford.

Deshingkar, P. and Sven, G. 2005, 'International Migration and Development: A Global Perspective', IOM Migration Research Series, Geneva: International Organisation for Migration.

Ellis, J. 2014, 'Climate Resilience Indicator Literature Review', Prepared as part of 'Using Columbia Basin State of the Basin Indicators to Measure Climate Adaptation', British Columbia, Canada: Columbia Basin Trust.

Farooq, M. Mateen, A. and Cheema, M. 2005, 'Determinants of Migration in Punjab, Pakistan: A Case Study of Faisalabad Metropolitan', *Journal of Agriculture and Social Sciences*, vol. 1, no. 3, pp. 280-282.

Folke, C. 2006, 'Resilience: The Emergence of a Perspective for Social-Ecological Systems Analysis', *Global Environmental Change*, vol. 16, no. 3, pp. 253-267.

Frankenberger, T. Spangler, T. Nelson, S. and Langworthy, M. 2012, 'Enhancing Resilience to Food Insecurity Amid Protracted Crisis', Rome: Food Insecurity in Protracted Crises - High Level Expert Forum, Food and Agriculture Organization (FAO), pp. 1-16.

Gazdar, H. 2005, 'A Review of Migration Issues in Pakistan', Regional Conference on Migration, Development and Pro-Poor Policy Choices in Asia, Dhaka: Department for International Development.

Government of Punjab 2015, 'Punjab Skills Development Sector Plan 2018: Providing Skills for Productive Employment', Lahore: Planning and Development Department.

Hear, N. V. Bakewell, O. and Long, K. 2012, 'Drivers of Migration, Migrating Out of Poverty', Brighton: The Department for International Development (DFID).

Himes-Cornell, A. and Hoelting, K. 2015, 'Resilience Strategies in the Face of Short- and Long-Term Change: Out-Migration and Fisheries Regulation in Alaskan Fishing Communities', *Ecology and Society*, vol. 20, no. 2.

Hussain, I. 2014, 'Urbanisation in Pakistan', Karachi: South Asia Cities Conference and Pakistan Urban Forum, 9 January, <[https://ishrathusain.iba.edu.pk/speeches/new-2013.../Urbanization\\_in\\_Pakistan.docx](https://ishrathusain.iba.edu.pk/speeches/new-2013.../Urbanization_in_Pakistan.docx)>.

IOM 2005, 'Migration, Development and Poverty Reduction in Asia', Geneva: International Organisation for Migration.

IPCC 2014, 'Summary for Policymakers', in *Climate Change 2014: Impacts, Adaptation and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge and New York: Cambridge University Press.

Irfan, M. Ehsanullah, A. R. and Hassan, A. 2014, 'Effect of Sowing Methods and Different Irrigation Regimes on Cotton Growth and Yield', *Pakistan Journal of Agricultural Sciences*, vol. 51, no. 4, pp. 789-795.

Jones, L. Jaspars, S. Pavanello, S. Ludi, E. Slater, R. Arnall, A. Grist, N. and Mtisi, S. 2010, 'Exploring How Disaster Risk Reduction, Social Protection and Livelihoods Approaches Promote Features of Adaptive Capacity', London: Overseas Development Studies.

King, R. and Skeldon, R. 2010, 'Mind the Gap- Integrating Approaches to Internal and International Migration', *Journal of Ethnic and Migration Studies*, vol. 36, no. 10, pp. 1619-1646.

Lipton, M. 1980, 'Migration from Rural Areas of Poor Countries: The Impact on Rural Productivity and Income Distribution', *World Development*, vol. 8, no. 1, pp. 1-24.

Lisa, E. Schipper, F. and Langston, L. 2015, 'A Comparative Overview of Resilience Measurement Frameworks', London: Overseas Development Institute.

Marshall, R. and Rahman, S. 2012, 'Internal Migration in Bangladesh: Character, Drivers and Policy Issues', Dhaka: United Nations Development Programme.

Ministry of Planning, Development and Reform 2016, 'Multidimensional Poverty in Pakistan', Islamabad: Government of Pakistan.

## Climate Change Resilience through Migration: A Case of Pakistan

- Mueller, V. Gray, C. and Kosec, K. 2014, 'Heat Stress Increases Long-Term Human Migration in Rural Pakistan', *Nature Climate Change*, vol. 4, no.3, pp. 182-185.
- Muthoni, J. and Wangui, E. 2013, 'Women and Climate Change: Strategies for Adaptive Capacity in Mwangi District, Tanzania', *African Geographical Review*, vol. 32, no. 1, pp. 59-71.
- Myers, N. 2005, 'Environmental Refugees: An Emergent Security Issue', Prague: 13<sup>th</sup> Economic Forum, Organisation for Security and Cooperation in Europe, May, pp. 23-27.
- Naveed, A. and Ali, N. 2012, 'Cluster Deprivation: District Profile of Poverty in Pakistan', Islamabad: Sustainable Development Policy Institute.
- Nelson, D. Adger, W. and Brown, K. 2007, 'Adaptation to Environmental Change: Contributions of a Resilience Framework', *Annual Review of Environment and Resources*, vol. 32, p. 395-419.
- OECD 2014, 'Guidelines for Resilience Systems Analysis', Organization for Economic Co-operation and Development (OECD) Publishing, <<https://www.oecd.org/dac/Resilience%20Systems%20Analysis%20FINAL.pdf>>.
- Ostrom, E. 2009, 'A General Framework for Analyzing Sustainability of Socio-Ecological Systems', *Science*, vol. 325, pp. 419-422.
- PBS 2015, 'Household Integrated Economic Survey (HIES) 2015-16', Pakistan Bureau of Statistics, <<http://www.pbs.gov.pk/content/household-integrated-economic-survey-hies-2015-16>>, accessed 21 May 2016.
- PBS 2014, 'Punjab Development Statistics', Lahore: Bureau of Statistics, Government of Punjab, Pakistan.
- Parry, M.L. 2007, 'Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability', in *Contribution of Working Group II to the Intergovernmental Panel on Climate Change Fourth Assessment Report*, Cambridge: Cambridge University Press.
- Qaisrani, A.A. 2015, 'Connecting the Dots: Linking Climate Change Resilience to Human Capital', Islamabad: Sustainable Development Policy Institute and PRISE.
- Qazi, H. Ahmad, S. and Majid, A. 1997, 'Climate Change Impacts and Adaptation Assessments in Pakistan', Unpublished.

- Raghuram, P. 2009, 'Which Migration, What Development? Unsettling the Edifice of Migration and Development', *Population, Space and Place*, vol. 15, no. 2, pp. 103-117.
- Rahman, A.R. Hayat, Y. Habib, Z. and Iqbal, J. 2011, 'Rural-Urban Disparities in Khyber Pakhtunkhwa Pakistan', *Sarhad Journal of Agricultural Sciences*, vol. 27, no. 3, pp. 477-483.
- Saeed, F. Salik, K. and Ishfaq, S. 2016, 'Climate Induced Rural-to Urban Migration in Pakistan', Islamabad: PRISE and Sustainable Development Policy Institute.
- Salik, K. Jahangir, S. Zahdi, W. and Hasson, S. 2015, 'Climate Change Vulnerability and Adaptation Options for the Coastal Communities of Pakistan', *Ocean & Coastal Management*, vol. 112, pp. 61-73.
- Sallu, S.M. Islam, M. Hubacek, K. and Paavola, J. 2014, 'Migrating to Tackle Climate Variability and Change? Insights from Coastal Fishing Communities in Bangladesh', *Climatic Change*, vol. 124, no. 4, pp. 733-746.
- Scheffran, J. Marmer, E. and Sow, P. 2011, 'Migration as Contribution to Resilience and Innovation in Climate Adaptation: Social Network and Co-development in Northwest Africa', *Applied Geography*, vol. 33, pp. 119-127.
- SDPI 2012, 'Annual Report 2012', Islamabad: Sustainable Development Policy Institute.
- Starr, L. and Tabaj, K. 2015, 'Resilience Capacities and the Gender Agenda: Moving towards Transformative Change [Powerpoint presentation]', Dhaka: TOPS Knowledge and Learning Event, 4 March,  
<[http://www.fsnnetwork.org/sites/default/files/Resilience%2C%20gender\\_TOPS\\_Asia.pdf](http://www.fsnnetwork.org/sites/default/files/Resilience%2C%20gender_TOPS_Asia.pdf)>.
- State Bank of Pakistan 2015, 'Annual Report 2014-2015 (State of the Economy)', Karachi: Govt. of Pakistan.
- Swanson, D. Hiley, J. Venema, H.D. and Grosshans, R. 2007, 'Indicators of Adaptive Capacity to Climate Change for Agriculture in the Prairie Region of Canada: An Analysis based on Statistics Canada's Census of Agriculture', Manitoba: International Institute for Sustainable Development.
- Tanner, T. Lewis, D. Wrathall, D. Bronen, R. Craddock-Henry, N. Huq, S. Lawless, C. Nawrotzki, R. Prasad, V. Rahman, M.A. and Alaniz, R. 2014, 'Livelihood Resilience in the Face of Climate Change', *Nature Climate Change*, vol. 5, no. 1, pp. 23-26.
- Tschakert, P. and Dietrich, K. 2010, 'Anticipatory Learning for Climate Change Adaptation and Resilience', *Ecology and Society*, vol 15, no. 2.
- Twigg, J. 2007, 'Characteristics of a Disaster-Resilient Community', London: DFID Disaster Risk Reduction Interagency Coordination Group, University College.

## Climate Change Resilience through Migration: A Case of Pakistan

USAID 2009, 'District Health Profile, Mardan', Pakistan Initiative for Mothers and Newborns, USAID, Pakistan Office.

Waldinger, M. 2015, 'The Effects of Climate Change on Internal and International Migration: Implications for Developing Countries', Working Paper No. 192, London: Grantham Research Institute on Climate Change and the Environment.

Warn, E. and Adamo, S.B. 2014, 'The Impact of Climate Change: Migration and Cities in South America', *World Meteorological Organization Bulletin*, vol. 63, no. 2.

Wright, H. Lake, L. and Dolman, P. 2012, 'Agriculture-A Key Element for Conservation in the Developing World', *Conservation Letters: A Journal of the Society for Conservation Biology*, vol. 5, no. 1, pp. 11-19.

Zaheer, R. 2013, 'Analyzing the Performance of Agriculture Sector in Pakistan', *International Journal of Humanities and Social Science Invention*, vol. 2, no. 5, p. 2319 – 7722.

## Annexures

### Annex 1: List of Variables Used for the Construction of Resilience Index

Livelihood Resilience/ Determinants	Explanatory Variables	Effect on Resilience	References
<b>Adaptive Capacity</b>			
<b><i>Assets, Access, Income and Food Security</i></b>			
Household income	Percent of households living above poverty line	Positive	Tanner et al. (2014); Brown (2011)
Dependency	Ratio of individuals in non-working age group to working age group	Negative	Barr et al. (2010)
Nature of dwellings	Percent of households having houses made of permanent material	Positive	Brooks and Adger (2005)
Food insufficiency	Percent of households food insecure	Negative	Wright et al. (2012)
Livestock ownership	Percent of households having livestock	Positive	Nelson et al. (2007); Ostrom (2009)
Land ownership	Percent of households having agriculture land	Positive	Nelson et al. (2007); Ostrom (2009)
Employment rate	Percent of work force employed	Positive	Adger et al. 2002
Education	Percent of people educated at secondary level and above	Positive	Himes-Cornell and Hoelting (2015)
Access to drinking water	Percent of households having access to improved drinking water facility	Positive	Salik et al. (2015)
Unequal access to resources	Gini-coefficient (0=equality; 1=inequality)	Negative	Twigg (2007)
<b><i>Strengthening and Adapting Livelihoods</i></b>			
Youth Population	Percent of non-elderly (14-29) population	Positive	Adger et al. (2002)
Income diversification	Percentage of households with more than one source of income	Positive	Adger et al. (2002)
Main purpose of agriculture and livestock produce	Percent of households selling crop and livestock produce in the market	Positive	Adger et al. (2002)
Source of water for irrigation	Percent of farming households having access to surface/tube well water	Positive	Ellis (2014)
Destabilisation of the livelihood system	Percent of households faced problems in livelihood activities	Negative	Adger et al. (2002)
Natural disasters	Percent of households affected by natural disaster in last five years	Negative	Ellis (2014)
Female involvement in workforce	Percent female labour force participation in livelihood activities	Positive	Muthoni and Wangui (2013)
Professional well-being	Percent of households satisfied with current profession	Positive	Tschakert and Dietrich (2010)
<b>Anticipatory Capacity</b>			
<b><i>Preparedness and Planning</i></b>			
Risk management perception	Percent of households dealing with problems with ease	Positive	Jones and Tanner (2015); Tschakert and Dietrich (2010)
Learning new skills	Percent of households learn new things in life	Positive	Tanner et al. (2014); Tschakert and Dietrich (2010)

## Climate Change Resilience through Migration: A Case of Pakistan

<b>Livelihood Resilience/ Determinants</b>	<b>Explanatory Variables</b>	<b>Effect on Resilience</b>	<b>References</b>
Degree of self-determination	Percent of households decide freely about life	Positive	Tanner et al. (2014); Tschakert and Dietrich (2010)
Planning for future	Percent of households do planning for future	Positive	Tanner et al. (2014)
Coping (food) strategies	Percentage of households dependent on more than three coping strategies	Positive	Tanner et al. (2014)
<b><i>Capacity, Information and Mobilisation</i></b>			
Lack of representation/ Social inequality	Percent of households think that have little chance to show their capabilities	Negative	Tanner et al. (2014); Tschakert and Dietrich (2010)
Degree of well-being and self-satisfaction	Percent of households think that they are satisfied and have valuable contribution to society	Positive	Tanner et al. (2014); Tschakert and Dietrich (2010)
Understanding climate change impacts	Percent of households perceive that climate change has impacted livelihood activities	Positive	Tschakert and Dietrich (2010)
Access to TV/newspaper	Percent of households have access to TV/newspaper	Positive	Swanson et al. (2007); Colten et al. (2008)
<b>Absorptive Capacity</b>			
<b><i>Saving and Safety Nets</i></b>			
Credit accessibility	Percent of households who have loans	Positive	Himes-Cornell and Hoelting (2015)
Reasons for taking loan	Percent of households take loans for livelihood improvement	Positive	Himes-Cornell and Hoelting. (2015)
Real state/financial property	Percent of households have real state/financial property	Positive	Cutter et al. (2008)
Transport	Percent of households with a vehicle of any type	Positive	Cutter et al. (2010)
<b><i>Substitutable and Diverse Assets and Resources</i></b>			
Substitute of domestic use water supply	Percent of households have substitute source of domestic use water supply	Positive	Frankenberger et al. (2013)
Substitute of drinking water supply	Percent of households have substitute source of drinking water supply	Positive	Frankenberger et al. (2013)
Water storage	Percent of households able to store water	Positive	Scheffran, Marmar, and Sow (2011)
Use of remittances for investment	Percent of households use remittances for livelihood investment purposes	Positive	Scheffran, Marmar, and Sow (2011)

## Annex 2

Livelihood Resilience/ Determinants	Explanatory Variables	Effect on Resilience	Migrant	Non-Migrant
<b>Adaptive Capacity</b>				
<i>Assets, Access, Income and Food Security</i>				
Household income	Percent of households living above poverty line	Positive	0.717	0.548
Dependency	Ratio of individuals in non-working age group to working age group	Negative	0.394	0.323
Nature of dwellings	Percent of households having houses made of permanent material	Positive	0.766	0.652
Food insufficiency	Percent of households food insecure	Negative	0.193	0.138
Livestock ownership	Percent of households having livestock	Positive	0.693	0.657
Land ownership	Percent of households having agriculture land	Positive	0.544	0.489
Employment rate	Percent of workforce employed	Positive	0.445	0.406
Education	Percent of people educated at secondary level and above	Positive	0.309	0.253
Access to drinking water	Percent of households having access to improved drinking water facility	Positive	0.816	0.764
Unequal access to resources	Gini-coefficient (0=equality; 1=inequality)	Negative	0.380	0.390
		<b>Average</b>	<b>0.526</b>	<b>0.462</b>
<i>Strengthening and Adapting Livelihoods</i>				
Youth Population	Percent of non-elderly (14-29) population	Positive	0.353	0.325
Income diversification	Percentage of households with more than one source of income	Positive	0.819	0.388
Main purpose of agriculture and livestock produce	Percent of households selling crop and livestock produce in the market	Positive	0.445	0.392
Source of water for irrigation	Percent of farming households having access to surface/tube well water	Positive	0.561	0.610
Destabilisation of the livelihood system	Percent of households faced problems in livelihood activities	Negative	0.350	0.366
Natural disasters	Percent of households affected by natural disaster in last five years	Negative	0.389	0.435
Female involvement in workforce	Percent female labour force participation in livelihood activities	Positive	0.067	0.083
Professional well-being	Percent of households satisfied with current profession	Positive	0.750	0.612
		<b>Average</b>	<b>0.467</b>	<b>0.401</b>
<b>Anticipatory Capacity</b>				
<i>Preparedness and Planning</i>				
Risk management perception	Percent of households dealing with problems with ease	Positive	0.418	0.306
Learning new skills	Percent of households learn new things in life	Positive	0.287	0.199
Degree of self-determination	Percent of households decide freely about life	Positive	0.721	0.697
Planning for future	Percent of households do planning for future	Positive	0.775	0.711

## Climate Change Resilience through Migration: A Case of Pakistan

<b>Livelihood Resilience/ Determinants</b>	<b>Explanatory Variables</b>	<b>Effect on Resilience</b>	<b>Migrant</b>	<b>Non-Migrant</b>
Coping (food) strategies	Percentage of households dependent on more than three coping strategies	Positive	0.427	0.348
		<b>Average</b>	<b>0.526</b>	<b>0.452</b>
<b><i>Capacity, Information and Mobilisation</i></b>				
Lack of representation/ Social inequality	Percent of households think that have little chance to show their capabilities	Negative	0.324	0.404
Degree of well-being and self-satisfaction	Percent of households think that they are satisfied and have valuable contribution to society	Positive	0.820	0.691
Understanding climate change impacts	Percent of households perceive that climate change has impacted livelihood activities	Positive	0.547	0.478
Access to TV/newspaper	Percent of households have access to TV/newspaper	Positive	0.664	0.570
		<b>Average</b>	<b>0.589</b>	<b>0.536</b>
<b>Absorptive Capacity</b>				
<b><i>Saving and Safety Nets</i></b>				
Credit accessibility	Percent of households who have loans	Positive	0.693	0.809
Reasons for taking loan	Percent of households take loans for livelihood improvement	Positive	0.462	0.347
Real state/financial property	Percent of households have real state/financial property	Positive	0.103	0.062
Transport	Percent of households with a vehicle of any type	Positive	0.758	0.662
		<b>Average</b>	<b>0.504</b>	<b>0.470</b>
<b><i>Substitutable and Diverse Assets and Resources</i></b>				
Substitute of domestic use water supply	Percent of households have substitute source of domestic use water supply	Positive	0.045	0.034
Substitute of drinking water supply	Percent of households have substitute source of drinking water supply	Positive	0.066	0.059
Water storage	Percent of households able to store water	Positive	0.471	0.489
Use of remittances for investment	Percent of households use remittances for livelihood investment purposes	Positive	0.263	0
		<b>Average</b>	<b>0.211</b>	<b>0.146</b>
		<b>Sum of Averages</b>	<b>2.822</b>	<b>2.467</b>