



**AgEcon** SEARCH

RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

## **Research Report: Impact of Remittance on Household Welfare: Evidence from the Western Region of Nepal**

Laxmi D. Adhikari <sup>a</sup>Ⓣ and Sayed Saghaian<sup>b</sup>

<sup>a</sup>*Master's Student, Department of Agricultural Economics,  
340 Charles E. Barnhart Bldg., University of Kentucky,  
Lexington, KY 40546, USA*

<sup>b</sup>*Professor, Department of Agricultural Economics,  
314 Charles E. Barnhart Bldg., University of Kentucky,  
Lexington, KY 40546, USA*

---

---

### **Abstract**

This study examines the impact of remittance on household welfare measured by consumption expenditures in the western region of Nepal. We used regional-level microeconomic data obtained from the Nepal Living Standards Survey (2010/2011) and employed Propensity Score Matching (PSM). Our results show that remittance-receiving households spend 34% and 20.33%, respectively, more per capita on agriculture and education than non-remittance-receiving households. However, there is no effect of remittance per capita on food expenditures. The findings of this study will be helpful to the federal-level policy makers in the western region of Nepal in deciding on scaling up migration-related programs.

**Keywords:** Nepal, PSM, remittance, western region

---

ⓉCorresponding author:

Tel: (859) 257-5762  
Email: laxmi.adhikari@uky.edu

## **Introduction**

Nepal's labor market has experienced a remarkable shift in foreign labor migration in the last two decades. According to the Central Bureau of Statistics (CBS) Nepal, it is estimated that in 2001, migration was 3.2%, whereas in 2011 migration increased to 7.3%. The same report shows that more than 520,000 labor permits were issued to Nepalis planning to work abroad in the fiscal year 2014 (CBS, 2014). Sluggish economic growth and political instability with weak infrastructure development, such as education, electricity, lack of access to jobs, and opportunities, force the young and active generations to pursue international migration in the effort to find employment. The outmigration has further proliferated decade-long internal conflicts. Malaysia is the number one destination country for Nepali migrants (40.9%), followed by Saudi Arabia (22.9%), Qatar (20.3%), United Arab Emirates (11.2%), and Kuwait (2.1%) (International Organization for Migration, 2019).

A few past studies on the impact of remittance on household welfare were carried out, considering all parts of Nepal (Thapa and Acharya, 2017; Wagle and Devkota, 2018). Findings from these studies are national and recommendations are general. Previous research argues that migration has a heterogeneous effect on different places. In other words, migration has a more positive effect in some areas and a positive or negative effect in other areas, so the impact of migration is region specific (de Haas, 2006). In this context, an important question arises: Does this general recommendation apply to a specific region in the country that has many regional disparities? The answer to this question demands region-specific research that helps in understanding the household spending behaviors of remittance receivers and non-remittance receivers. Therefore, using regional-level microeconomic data obtained from the Nepal Living Standards Survey (NLSS) (2010/2011), our research focuses on the western region of Nepal. The region-wide policy is important for the western region of Nepal for two reasons. First, Nepal has adopted a new federal-state structure following the promulgation of the Constitution of Nepal in 2015 (Dahal, 2020). This change from a unitary to a federal system facilitates an inclusive and responsive system of governance and promotes an effective and efficient service delivery system to the people (Acharya, 2018). Second, the western region of Nepal had the highest rates of poverty with a poverty gap in the range of 4.27 to 10.74 in 2011 (Asian Development Bank, 2013). In this context, the major objective of this research was to understand the impact of remittance on household welfare, which is measured in terms of food expenditures, agricultural expenditures, and educational expenditures.

This study employed Propensity Score Matching (PSM) to estimate the causal impact of remittance on consumption expenditures. Our results show that remittance-receiving households spend almost 34% and 20.33%, respectively, more per capita on agriculture and education than non-remittance-receiving households. The findings of this study will be helpful to the federal-level policymakers in the western region of Nepal in developing strategies that can help people benefit more from the migration that is taking place.

The remainder of the paper is organized as follows. The next section provides a background and literature review of the impact of remittance, while the subsequent section describes data, variable

definitions, and pre-outcome analysis. The following section describes the model. The next section presents the results, while the final section contains the conclusion, policy implications, and limitations of this research.

## **Background and Literature Review**

Literature on welfare suggests that consumption expenditure is the better measure of household welfare in developing countries because consumption indicates what people get, and it remains almost the same throughout the year (Skoufias, Davis, and Behrman, 1999). Therefore, we measure welfare in terms of food expenditures, agricultural expenditures, and educational expenditures. Findings of the previous literature on these three welfare indicators follow.

Starting with remittance and food expenditures, Andersson (2014) found that remittance-receiving households in Ethiopia spend almost 50% of remittance income on food. However, using the National Sample Survey data from India, Parida and Mohanty (2013) concluded that food expenditures of remittance-receiving households was 2% less at the margin compared to the non-remittance-receiving households. Similarly, Thapa and Acharya (2017), using the Nepal Living Standards Survey data, noted that remittance-receiving households tend to spend less on food. Adams and Cuecuecha (2013), using the data of Ghana Living Standards Survey (GLSS), found no significant difference in spending behaviors on food among remittance-receiving and non-remittance-receiving households. Thus, reviewing the results of previous literature to this point suggests mixed findings of remittance's effect on household food expenditures.

Regarding remittance and agricultural expenditures, a study conducted by Castaldo and Reilly (2015) asserted that remittance income is used by many households to reduce their workload by hiring outside labor, thereby increasing the leisure time of household members. Singh, Singh, and Jha (2012) studied the effect of migration on agricultural productivity in Bihar, India, and concluded that remittance-receiving households spend remittance on adopting modern agricultural technologies and improved seeds of rice, causing higher agricultural production. Similarly, Mendola (2008), using the cross-sectional household survey data from Bangladesh, noted the positive role of remittance on the adoption of new agricultural technology, which has a positive effect on agricultural expenditures, leading to improved agricultural production. Thus, findings of previous studies indicate a positive association between remittance and agricultural expenditures.

Finally, regarding remittance and educational expenditures, Thapa and Acharya (2017) studied the impact of remittance using the NLSS data of 2010/2011 and concluded that remittance-receiving households in Nepal tend to spend more on educational attainment. Parida and Mohanty (2013), using large-scale household survey data, studied the role of remittance on household expenditure patterns in India. They found that marginal spending behaviors of the remittance receiver in education were 12% higher than the non-receiver. Based on these results, the authors concluded that remittance has a positive effect on human capital investment. Another study by Calero, Bedi, and Sparrow (2009), using the National Living Standards Survey (NLSS) data from Ecuador, found that remittance has a positive effect on educational attainment and reduces child labor.

Hence, reviewing research findings inside and outside Nepal show the positive impact of remittance on education.

## Data, Variable Descriptions, and Pre-Outcome Analysis

Data for this study came from the Nepal Living Standards Survey (NLSS) provided by the Central Bureau of Statistics, Nepal. Until now there have been three waves of data collected by CBS: 1995/1996, 2004/2005, and 2010/2011. We are using the third wave of data from 2010/2011. Data have been collected using various socioeconomic questionnaires, including demographics, consumption, remittance, assets, access to facilities, housing condition, education status of the family members, and employment status. The total sample size was 2,436 households. Variable definition and pre-outcome analyses in Table 1 show that remittance-receiving households and non-remittance-receiving households are significantly different in certain observed characteristics. In other words, two groups are different, and two groups are required to make a comparable on all observed characteristics for the causal inference of remittance on household welfare.

**Table 1.** Variable Definition and Pre-Outcome Analysis

Variable	Definition	Remittance Receiver (mean)	Remittance Non-Receiver (mean)	P-Value
Gender	Gender of household head	0.617	0.707	0.000
Age	Age of the household head in years	45.047	46.069	0.092
HH size	Total number of members in the household	4.464	4.767	0.000
Dependent young members	Dependent 0-4 years of age	0.467	0.565	0.002
Mid-age members	Age 15-29	1.252	1.225	0.598
Adult age members	Age 30-60	1.346	1.454	0.004
HH job code	Household head job in 6 sectors: Service, Technical, Teaching, Wage earning, Agriculture and Other	4.410	4.469	0.280
Education	Years of schooling of the household head	15.403	15.852	0.003
Total land	Total land size of a household in hectares	0.151	0.176	0.011
Per capita educational expenditure	Total annual education expenditure divided by household size	1541.117	1320.08	0.008
Per capita agricultural expenditure	Total annual agriculture expenditure divided by household size	4664.421	3324.506	0.001
Per capita food expenditure	Total monthly food purchase divided by household size	2579.198	2423.939	0.046
Sample size		869	1,567	

## Model

We use the Propensity Score Matching (PSM) proposed by Rosenbaum and Rubin (1983) to estimate the causal effect of remittance on food expenditures, agricultural expenditures, and educational expenditures. Because remittance is not randomly assigned, remittance-receiving households and non-remittance-receiving households are different in certain characteristics, which we already observed from the pre-outcome analysis in Table 1. Thus, we cannot compare these two groups without making them comparable. In the case of observational data, PSM is one of the approaches to compare two groups. PSM was also applied by Clement (2011) and Thapa and Acharya (2017) to study the impact of remittance. We implement PSM in following three steps;

### *Estimating the Propensity Score Using Logit Model*

$$D_i = \widehat{\beta}_0 + \widehat{\beta}_1 X_{1i} + \widehat{\beta}_2 X_{2i} + \widehat{\varepsilon}_i \quad (1)$$

Where,  $i$  is a household,  $D$  is an indicator variable for remittance-receiving households and is treated as 1 if a household is receiving remittance and zero otherwise;  $\varepsilon$  is the error term; and  $\beta$  is the coefficient. The vectors  $X_1$  and  $X_2$  represent household characteristics and farm characteristics, respectively. Examples of household characteristics include gender of the household head, age of the household head, household size, number of dependent members, middle-aged and adult-aged members in a household, occupation of the household head, and education of the household head. Similarly, an example of farm characteristics is total land size.

### *Choosing Matching Algorithm*

We use the Nearest Neighbor matching because Rubin (1973) argues that it is one of the most common and easiest to implement matching method. In Nearest Neighbor matching, the treated household is matched with the nearest control household having similar propensity scores.

### *Assessing the Matching Quality*

We assess the matching quality by comparing the means of observed characteristics (covariates) in treated and control groups. After matching, no significance difference between means of observed characteristics indicates a good matching quality. Additionally, visual analysis of similar covariates distribution in treated and control group confirms that two groups are similar in observed characteristics.

### *Estimating Average Treatment Effect on the Treated*

Average treatment effect on the treated (ATT) gives the impact of remittance on remittance-receiving households. ATT is estimated as;

$$\widehat{\tau}_{ATT} = E[Y_i(1)|D_i = 1] - E[Y_i(0)|D_i = 1] \quad (2)$$

Where  $E[Y_i(1)|D_i = 1]$  is an average outcome if they have received remittance, and  $E[Y_i(0)|D_i = 1]$  is an average outcome had they not received remittance denoting counterfactual.

## Results

### *Propensity Score Matching*

A logit model is used to estimate the propensity scores of remittance receivers and non-remittance receivers. The results from the logit model and the variables used in the matching procedures are reported in Table 2. Our results show that a household headed by a male who is older reduces the likelihood of receiving remittance. Similarly, having a higher number of children below 4 years of age reduces the likelihood of receiving remittance. This finding implies that a household having dependent young children cannot receive remittance because the parents must take care of them. In addition, a wage-earning head of household's major occupation also reduces the likelihood of receiving remittance.

**Table 2.** Propensity Score Matching

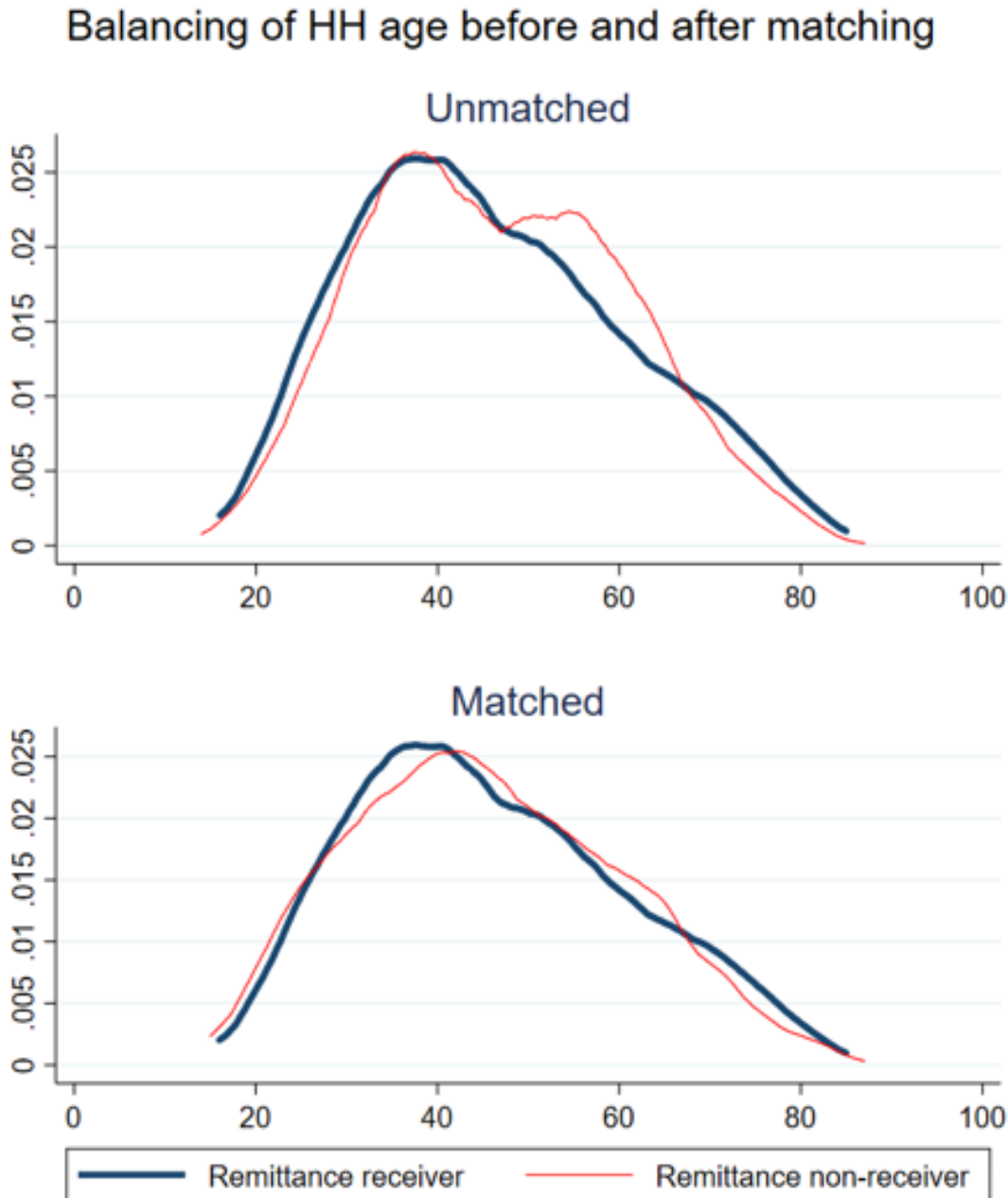
Dependent Variable-Remittance	Coefficient	Standard Error	P-Value
Gender_HH	-.256**	.126	0.043
AgeHH	-.056**	.028	0.044
AgeHH_sq	.000**	.000	0.048
HH size	.032	.042	0.442
Dep_young(0-4 yrs)	-.299***	.088	0.001
Mid-age members (15-29 years)	.043	.060	0.472
Adult age members (30-60 years)	-.040	.099	0.684
Technical skill	.702	.509	0.167
Teaching	-.001	.314	0.996
Wage earning	-.481*	.274	0.079
Agriculture	-.189	.223	0.395
Other	-.202	.316	0.522
Education of HH head(years)	-.015	.017	0.369
Total land	-.191	.569	0.737
Total land_sq	-.311	.504	0.537
Constant	1.333	.652	0.041

Note: Single, double, and triple asterisks (\*, \*\*, \*\*\*) denote significance at the 10%, 5%, and 1% levels, respectively.

### *Assessing the Matching Quality*

We assess the matching quality by plotting the distributions of all explanatory variables before and after matching. Distributions of all variables after matching are similar in both remittance receivers and non-remittance receivers. For the sake of brevity, we have presented the distribution of the variable age of the head of household in Figure 1. Distribution is almost similar in both groups after matching. A similar distribution of variables in two groups increases the likelihood that the

two groups are similar in all observed characteristics, and any difference in outcome indicator is due to remittance. This lends credence to the validity of our experimental design for determining the causal impact of remittance on household food, agriculture, and educational expenditures.



**Figure 1.** Assessing the Matching Quality in Age of the Household Head



*Estimation of Remittance Effects on Household Welfare*

Our results using the Nearest Neighbor matching in Table 3 show that there is no significant effect of remittance on food expenditures. Similar results have been found by Randazzo and Piracha (2014) and Castaldo and Reilly (2015). They reported that international transfer reduces food expenditures, whereas domestic transfer shows no effect on household expenditure decisions. However, our results show that remittance-receiving households spend 34% more per capita on agriculture. This result is consistent with the result from de Haas (2006) using data from Morocco, where the author found that remittance income is primarily invested in housing and agriculture. Because the remittance-receiving households are substantially more likely to spend on agriculture, these results are highly suggestive of the role of remittance on the improvement of agriculture development in the western region of Nepal. Similarly, our results show that remittance-receiving households spend 20.33% more per capita on education compared to non-remittance-receiving households. This finding is consistent with the previous results from Bansak and Chezum (2009) and Bohra-Mishra (2011), where the authors found the positive impact of remittance on educational expenditures in Nepal. In conclusion, remittance-receiving households spend more on agriculture and education than the non-remittance-receiving households.

**Table 3.** Nearest Neighbor Matching

<b>Outcome Variable</b>	<b>Remittance-Receiving Household</b>	<b>Non-Remittance-Receiving Household</b>	<b>ATT</b>
Per capita food expenditure	9.021	9.046	-.025(-0.72)
Per capita agricultural expenditure	9.217	8.877	.340***(3.60)
Per capita educational expenditure	8.306	8.103	.203**(2.07)

Note: *t*-statistics in parentheses. Double and triple asterisks (\*\*, \*\*\*) denote significance at the 5% and 1% levels, respectively.

**Conclusions**

Using the western region-level microeconomic data obtained from the Nepal Living Standards Survey in 2010/2011 and employing propensity score matching, we found evidence that remittance-receiving households spend 34% and 20.33%, respectively, more per capita on agriculture and education than non-remittance-receiving households. However, there is no impact of remittance on food expenditures.

The findings of this study can be used by federal-level policy makers in the western region of Nepal. The policy-level implication of positive and significant impacts of remittance on agriculture is important for necessary federal-level policy considerations for improving the agricultural sector in the western region of Nepal. The federal government can work on developing proper infrastructure and modern agricultural technology to create an environment conducive to

remittance receivers investing more in agriculture. Similarly, at the household level, higher spending on education among remittance-receiving households can help build human capital in the western region. The focus of this study on poverty and income disparity in the western region provides an important perspective on the impact of remittance. Finally, our results should be interpreted with the following caveats in mind. First, we consider remittance as money sent by absentees, so remittance can be both national and international. Second, the western region used in our study includes the western development region, the mid-western development region, and the far-western development region in Nepal. Third, the data we use is ten years old and things might have changed during this time. Thus, a household's expenditure pattern ten years ago could be significantly different from current expenditure.

## References

- Acharya, K.K. 2018. "Local Governance Restructuring in Nepal: From Government to Governmentality." *Dhaulagiri Journal of Sociology and Anthropology* 12:37–49.
- Adams, R.H., and A. Cuecuecha. 2013. "The Impact of Remittances on Investment and Poverty in Ghana." *World Development* 50:24–40.
- Andersson, L. 2014. "Migration, Remittances and Household Welfare in Ethiopia." UNU-MERIT Working Papers. Available online: <http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=BEB7FEFEDF76B9195FB43EF9BAADCC4D?doi=10.1.1.645.9220&rep=rep1&type=pdf>.
- Asian Development Bank. 2013. *Country Poverty Analysis—Nepal*. Available online: <https://www.adb.org/sites/default/files/linked-documents/cps-nep-2013-2017-pa-detailed.pdf>.
- Bansak, C., and B. Chezum. 2009. "How Do Remittances Affect Human Capital Formation of School-Age Boys and Girls?" *American Economic Review* 99(2):145–148.
- Bohra-Mishra, P. 2011. *Migration and Remittances during the Period of Civil Conflict in Nepal*. PhD dissertation, Princeton University. Available online: <http://www.proquest.com/docview/872183999/abstract/118233FF9F094983PQ/1>.
- Calero, C., A.S. Bedi, and R. Sparrow. 2009. "Remittances, Liquidity Constraints and Human Capital Investments in Ecuador." *World Development* 37(6):1143–1154.
- Castaldo, A., and B. Reilly. 2015. "Do Migrant Remittances Affect the Consumption Patterns of Albanian Households?" *South-Eastern Europe Journal of Economics* 5(1). Available online: <https://195.251.214.125/index.php/seeje/article/view/5570>.
- Central Bureau of Statistics-Nepal. 2014. *Nepal Living Standards Survey 2011 Statistical Report*. Kathmandu, Nepal: Central Bureau of Statistics-National Planning Commission Secretariat, Government of Nepal.

- Clement, M. 2011. "Remittances and Household Expenditure Patterns in Tajikistan: A Propensity Score Matching Analysis." *SSRN Electronic Journal*. Available online: <http://www.ssrn.com/abstract=2001145> [Accessed May 25, 2021].
- Dahal, H., M. Karki, T. Jackson, and D. Panday. 2020. "New State Structure and Agriculture Governance: A Case of Service Delivery to Local Farmers in the Eastern Gangetic Plains of Nepal." *Agronomy* 10(12):1874.
- de Haas, H. 2006. "Migration, Remittances and Regional Development in Southern Morocco." *Geoforum* 37(4):565–580.
- IOM. 2019. *Migration in Nepal. A Country Profile*. Geneva, Switzerland: International Organization for Migration.
- Mendola, M. 2008. "Migration and Technological Change in Rural Households: Complements or Substitutes?" *Journal of Development Economics* 85(1–2):150–175.
- Parida, J.K., and S.K. Mohanty. 2013. "Role of Remittances on Households' Expenditure Pattern in India." MPRA Paper No. 62395. Available online: <https://mpra.ub.uni-muenchen.de/62395/>.
- Randazzo, T., and M. Piracha. 2014. "Remittances and Household Expenditure Behaviour in Senegal." Rochester, NY: Social Science Research Network No. ID 2426860. Available online: <https://papers.ssrn.com/abstract=2426860> [Accessed July 28, 2021].
- Rosenbaum, P.R., and D.B. Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70(1):41–55.
- Rubin, D.B. 1973. "Matching to Remove Bias in Observational Studies." *Biometrics* 159–183.
- Singh, R.K.P., K. Singh, and A. Jha. 2012. "Effect of Migration on Agricultural Productivity and Women Empowerment in Bihar." *SSRN Electronic Journal*.
- Skoufias, E., B. Davis, and J.R. Behrman. 1999. "An Evaluation of the Selection of Beneficiary Households in the Education." In *Health, and Nutrition Program (PROGRESA) of Mexico, Final Report*. Washington, DC: International Food Policy Research Institute.
- Thapa, S., and S. Acharya. 2017. "Remittances and Household Expenditure in Nepal: Evidence from Cross-Section Data." *Economies* 5(2):16.
- Wagle, U.R., and S. Devkota. 2018. "The Impact of Foreign Remittances on Poverty in Nepal: A Panel Study of Household Survey Data, 1996–2011." *World Development* 110:38–50.