

# Is Male Out-Migration Associated with Women's Participation in Post-Disaster Rebuilding? Evidence from Post-Earthquake Nepal: Appendix and Supplementary Material

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## A. Quantitative Methods and Information on Variables

The R Package *bife* was used to fit the models and correct the results for bias resulting from the incidental parameter problem (Stammann et al. 2020; Stammann, Heiss, and McFadden 2016; Hahn and Newey 2004). The original regression coefficients can be seen in Table A1. The results are fairly robust to model specification, including linear probability models with and without marital status as an interaction. Appropriate controls were to attempt to obtain an estimate as unbiased as possible. Each indicator of rebuilding participation has larger implications in these processes, which are described below.

Table A1: Regression results

	<i>Dependent variable:</i>		
	Consult Knowledge	Visiting Office in Person	Partnership Agreement in Name
	(1)	(2)	(3)
Male Out-Migrant	0.944** (0.323)	1.628*** (0.368)	0.671* (0.304)
Family Members (logged)	-0.102 (0.281)	-1.863*** (0.506)	-1.122** (0.360)
Level of House Damage	0.192 (0.196)	-0.320 (0.330)	0.097 (0.254)
Marital Status	-0.273 (0.375)	-1.676** (0.596)	-2.200*** (0.435)
Age	-0.039*** (0.011)	-0.010 (0.015)	0.031** (0.012)
Started Rebuilding	1.127*** (0.308)	0.233 (0.623)	0.400 (0.442)
District FE	Yes	Yes	Yes
Observations	453	259	389

Resid. Dev.	405.22	233.92	346.57
Null Dev.	563.39	353.75	523.11
Ave Individ. FE	1.833	4.868	1.276

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

*Note: Logistic regression estimation. Standard errors in parentheses.*

#### *A.I. Knowledge of who and where to consult*

Model 1 includes an indicator of whether a respondent has knowledge of who and where to consult for information about rebuilding (Dolan 2011). Specifically, the survey question asked, “Do you know who and where to consult regarding [the] reconstruction process?” Knowledge of a process has been highlighted as a key component of women’s participation, be it political, economic, or related to one’s own health and education (Kabeer 1999; Hashemi, Schuler, and Riley 1996; Ibrahim and Alkire 2007; Wiig 2013; Colfer et al. 2015; Bleck and Michelitch 2018; Sarkar, Sahoo, and Klasen 2019). Presumably, women under conditions of male out-migration will have to have greater knowledge of how to participate if they are, in fact, participating more in the process of rebuilding their private homes. While a positive relationship between male out-migration and knowledge of where to consult does not reveal the process by which a respondent had to undertake to acquire such knowledge, the indicator represents a key factor in rebuilding.

#### *A.II. Visiting local level official*

Model 2 includes an indicator of whether a respondent has visited a local government official in person for information. The survey question asked, “Who goes to inquire about the process of reconstruction to the concerned authority?” This model is of particular interest due to the implications for increased mobility, which is known to be a key part of female empowerment, and contact with local government officials, which is theorized to be connected to forms of active ‘citizenship’ practices—a critical part of democratic agency (Chhibber 2002; Kruks-Wisner 2018). While previous research suggests that women in patriarchal societies might depend on local government more than informal networks during post-disaster reconstruction (Kruks-Wisner 2011), to my knowledge the variation has not been yet connected quantitatively to male out-migration. By establishing the relationship between these two variables, this study seeks to highlight the need for more attention to the intersection of male out-migration and post-disaster reconstruction as concerns reliance on formal, government-sponsored channels for rebuilding support and women’s mobility in the community in particular.

#### *A.III. Entering a rebuilding agreement with local government*

Model 3 uses an indicator of whether the respondent has entered into a formal rebuilding partnership agreement (PA) with the government in her own name. The PA was issued in the name of the head of the household who had to submit his or her citizenship and land ownership certificates to the local government—generally municipal ward offices. Other legal documents such as marriage certificate or

verification of one's relationship to the owner was required if the household head wanted to nominate another family member as the grant beneficiary (Shneiderman et al. 2021). Entering into legal processes like a PA might be indicative of—or even generative—of greater female autonomy and strategic decision-making in the household, which has been tied to greater preparedness in other types of environmental pressures (Grillos 2018).

## B. Qualitative Methods

Interviews were conducted primarily over the phone in Nepali by a CITI-trained (Collaborative Institutional Training Initiative for research with human subjects) research assistant under close supervision. Three were conducted in person. Respondents were made aware of the study, my institution, and our identities per the project's Institutional Review Board (IRB) protocol. Before and after the interviews, the research assistant and I discussed the interviews, including the general tenor and specifics about the data collected. Most interviews were recorded with the respondents' permission. Notes were taken for those that were not recorded. Some interviewees requested that parts of the conversation not be recorded—for these interviews, only that which was recorded was used as data.

Although certain types of metadata like body language are unavoidably lost by conducting interviews over the phone, the decision to conduct interviews through these means began with concerns about the Covid-19 global pandemic and was continued due to the other benefits it provided. Several respondents conveyed that they were able to move to private areas or call back when it was easier for them to talk.

## C. Survey and HRRP

The data from the quantitative portion of this study come from a survey conducted in 2018 by the Housing Recovery and Reconstruction Platform (HRRP) (HRRP 2018). HRRP was created in December 2015 to replace the emergency housing and shelter cluster created as a part of the immediate emergency response. HRRP collects data, writes and disseminates reports, and coordinates among various state and non-state actors to facilitate and monitor the post-earthquake rebuilding. The original survey used for this paper was collected in the spring of 2018 and conducted in Nepali in the second most and most heavily affected districts. Information from the 2011 Nepali Census on the district populations can be found in Table C1 and on the household types in Table C2. The questions for the data used in this paper translated into English can be found in Table C3.

Table C1. Descriptive statistics of districts with the highest two levels of damage

	District level damage	Men abroad	Population	Density
Bhaktapur	Severe	8,077	304,651	2,560
Dhading	Most Severe	20,207	336,067	174
Dolakha	Most Severe	8,266	186,557	85

Gorkha	Most Severe	25,375	271,061	75
Kathmandu	Severe	71,837	1,744,240	4,416
Kavrepalanchok	Severe	12,565	381,937	274
Lalitpur	Severe	17,573	468,132	1,216
Makawanpur	Severe	14,374	420,477	173
Nuwakot	Most Severe	12,466	277,471	248
Okhaldhunga	Severe	9,371	147,984	138
Ramechhap	Most Severe	9,742	202,646	131
Rasuwa	Most Severe	2,236	43,300	28
Sindhuli	Severe	14,003	296,192	119
Sindhupalchowk	Most Severe	13,035	287,798	113

*Note: The second to highest category of district level damage was denoted as 'Crisis Hit' in HRRP (2018). It has been changed to 'Severe' in this table for ease of comparison to 'Most Severe.'*

*Source: HRRP 2018; Nepal Census 2011*

Table C2. Household foundation types by district

	Total HHs (stated)	Type of household foundation					
		Mud bonded brick/stone	Cement bonded brick/stone	RCC with pillar	Wooden pillar	Other	Not stated
Bhaktapur	68,557	28,269	17,894	20,868	290	273	963
Dhading	73,842	63,985	3,416	3,958	1,924	114	445
Dolakha	45,658	42,960	917	887	637	43	214
Gorkha	66,458	58,275	2,284	3,660	1,702	187	350
Kathmandu	435,544	80,811	165,677	174,916	2,522	1,243	10,375
Kavrepalanchok	80,651	68,449	5,382	5,095	613	146	966
Lalitpur	109,505	36,858	34,151	33,934	562	275	3,725
Makawanpur	86,045	44,230	11,671	3,082	26,410	272	380

Nuwakot	59,194	55,189	2,056	1,155	149	26	619
Okhaldhunga	32,466	31,284	124	102	565	75	316
Ramechhap	43,883	42,327	434	287	322	29	484
Rasuwa	9,741	8,736	549	180	203	13	60
Sindhuli	57,544	20,798	1,804	1,222	33,310	67	343
Sindhupalchowk	66,635	61,377	2,708	1,322	651	34	543

Source: Nepal Census 2011

Table C3. Select survey questions

Questions	Options
Is there anyone working abroad in your family? <i>Note on HRRP instrument: 'Targeted to women whose male family member are migrant workers'</i>	a. yes b. no
How many members are there in your family?	open
What is your marital status?	a. single b. married c. divorcee d. widow
What is your age?	open
Was your house...?	a. moderately damaged b. severely damaged c. completely damaged
Have you started reconstructing your house?	a. yes b. no
What is your district?	a. Bhaktapur b. Dhading c. Dolakha d. Gorkha e. Kathmandu f. Kavrepalanchok g. Lalitpur h. Lamjung i. Makwanpur j. Nuwakot k. Okhaldhunga l. Ramechhap

	m. Rasuwa n. Sindhupalchowk o. Sindhuli
Do you know how and where to consult regarding the reconstruction process?	a. yes b. no
Do you [as a household] visit your nearby government offices to inquire about the grant and reconstruction process?	a. yes b. no
Who goes to inquire about the process of reconstruction to the concerned authority?	a. self b. husband c. other family members
Is the partnership agreement in your name, your husband's name, or any other name?	a. own b. husband c. other

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Source: HRRP 2018

#### D. Excerpt of Partnership Agreement

This section includes a translated excerpt of the Partnership Agreement between households and the local government. The PA was drafted before the promulgation of the 2015 Constitution and the restructuring of the local level units from the Village Development Committee (V.D.C.s) to the current administrative units. As such, the excerpt here refers to the administrative units as V.D.C.s. This document existed alongside two other official documents—the Proxy Authorization Form and the Land Authorization Form. Copies of 1.) the Partnership (or Participation) Agreement, 2.) the Proxy Authorization Form, and the 3.) Land Authorization Form in Nepali and in English (unofficial) are available on request.

*Things to understand before signing the agreement:*

1. *Grant agreement is an agreement between the concerned local body and beneficiary. This grant is allotted to help reconstruct private houses destroyed during the earthquake. There is no way to receive a government grant without this agreement.*
2. *One can sign this agreement at relevant V. D.C. (Village Development Committee)/Municipality or at designated camps.*
3. *The owner of the house who is to receive the grant should be present during the agreement. In case, a beneficiary cannot be present during the agreement, an official representative can be appointed in the suggested format.*
4. *A beneficiary house owner shall bring following documents for agreement:*
  - a. *A Citizenship Certificate*
  - b. *Land registration certificate (a document disclosing the ownership of the land and the house)*
  - c. *In case you have the registration number from the survey carried out after the earthquake, please bring that too.*

5. For some reason, if you were unable to register yourself during the survey, please fill up the complaint form at your V.D.C./Municipality.

6. The name of the people who are eligible to sign the agreement will be published at the concerned District office/ Municipality/ V.D.C. You should be present at the designated spot on the designated date to sign the agreement. You can still sign the agreement in case you missed the date. However, make sure to show up in time.

Grant agreement form for the reconstruction of the private houses destroyed during earthquake:

Survey registration no.

Surveyed House owner serial no.

Agreement serial no.

For the reconstruction of the houses damaged due to the earthquake that occurred on 2072 Baisakh 12 (2015-April-25) and its aftershock, I .....(name)..... resident of ..... (write address), grandson/daughter of ....., son/daughter of ..... of age .....yrs. and ..... (name of a concerned VDC/Municipality) have agreed on .....(date)..... to reconstruct the damaged house. We agree to participate in the task of reconstruction according to the following criteria designated by the Nepal Government.

The First party (beneficiary) agrees to the following:

1. It is true that my house was destroyed due to the earthquake of 2072 Baisakh 12 ( 2015-April-25) or its aftershock.
2. I do not own other livable houses. I demand the grant for the reconstruction of one house only.
3. I haven't received grants from other organizations or bodies. I also agree not to claim or ask grants from other institutions after this.
4. The house that is to be reconstructed is under my or one of my family members' names.
5. I agree to follow the procedure described in the grant distribution policy, 2072 while reconstructing the house. I agree to adhere to the terms and conditions of this agreement, use the technologies prescribed and construct the house as per the criteria and quality required by this agreement.
6. I will be obliged to purchase material required for the construction. I will also be obliged to hire the manpower needed for the reconstruction. Moreover, it will also be my duty to make sure that they do their job.
7. I will utilize the grant solely for the reconstruction of the house.
8. The investments beside that covered by the grant, I will make sure I will invest them myself or borrow loans from Convenience Loan/Special Housing Loan allotted to the earthquake victims. I promise to complete the task of reconstructing through these investments.
9. I agree to participate in the orientation and the training provided in relation to the reconstruction program.
10. I will receive the first installment amounting Rs. 50,000 through the bank a/c opened in the designated Bank.
11. I will receive the second installment amounting Rs. 80,000 after I have completed constructing the plinth course. The District Project Implementation Unit working under the Ministry of Urban Development will need to verify that the technologies used and the quality of construction were as per the agreement before allotting the installment.

12. I will receive a third installment amounting Rs. 70,000 only when the District Project Implementation Unit has verified that I have finished constructing all of the house except roof and technologies thus used and quality of reconstruction were as per agreement.
  13. After I have finished constructing the roof of the house, I agree to have it verified whether the house was reconstructed per agreed terms.
  14. In the case that I have failed to reconstruct the house the way the agreement demanded, I agree to make necessary adjustments to match those requirements using my own means and resources.
  15. The details mentioned above are true. In case I failed to fulfill these terms and conditions, I hereby agree to pay a fine as required by the law in trend.
- The Second Party (concerned local Body) agrees to the following:
1. Nepal Government agrees to allot aforementioned housing reconstructing funds through the designated bank provided that the first party fulfills the terms and conditions of this agreement.

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