Supplementary Material – S1

The Nepal Community Forestry Program and REDD+ Participation

Nepal experienced heavy deforestation and environmental degradation starting in the 1960s, which has been primarily attributed to the nationalization of forests (Ojha et al. 2007; Guthman 1997; Timilsina and Paudel 2003). The government and its development partners began to recognize the limitations of centralized management and as a result looked to decentralization and community-based forest management as alternatives. Community forest management has been pursued since the late 1970s and was formalized in the early 1990s.

The introduction of the National Forestry Plan in 1976 first raised the possibility of 'handing over' forest management responsibilities to local governments (Fox 1993). The emergence of participatory discourse and increased international pressure (Hobley 1996) for devolution led to the enactment of the Decentralisation Act of 1982, which empowered local governments to manage local of forests (Regmi 1984). While the government has enacted various policies and programs to support different community strategies over the past two decades, these share common directions in that they transfer management rights to locally formed groups and provide them greater tenure security and more benefits of forest management (Springate and Blaikie 2007; Carter and Gronow 2005; Nurse and Malla 2005).[1]

The Master Plan for the Forestry Sector of 1989 provides the foundation for CF governance. It was followed by the Forest Act of 1993, which provided a clear legal basis for CF, enabling the government to hand over areas of national forest to locally formed CFUGs. The provisions were later detailed in the 1995 Forest Regulations and the Community Forestry Operational Guidelines of 1995

[1] There are six different community forest management programs in Nepal: community forestry (CF), leasehold forestry, watershed management, collaborative forest management, conservation areas and buffer zone community forests (BZCF) around protected areas.

that were updated in 2009. According to the Forest Act and associated regulations, the CFUGs are recognized as self-governing, independent, autonomous, perpetual and corporate institutions, so they can acquire, possess, transfer, or otherwise manage movable or immovable property (HMGN/MoLJ 1993: Article 43). The District Forest Officer, who is the main local-level forest officer, may hand over any part of a National Forest to user groups provided both parties agree to operational plans. The groups are entitled to receive all the benefits from the management of the forest. As of 2016 the CF program has expanded to over 19,000 CFUGs with the involvement of over 1.45 million households (almost 35% of the households) managing over 1.8 million ha of forests (MoFSC 2017). Almost 65% of the forests in the hills and 18% of Terai forests are CFs (MOFSC 2013).

The REDD+ process in Nepal started in 2008 after the United Nations Framework Convention on Climate Change COP 13. Right after COP 13 the government of Nepal submitted the REDD Readiness-Plan Idea Note (R-PIN) to the Forest Carbon Partnership Facility (FCPF) of the World Bank. Once the R-PIN was approved, the Ministry of Forest and Soil Conservation (MoFSC) established the REDD Forestry and Climate Change Cell (REDD Cell), an administrative unit to handle REDD+ activities. The development of the Readiness Preparation Proposal (RPP) took place during 2009/2010. There was keen interest and support of donors and NGOs during the RPP development process. The RPP was approved by the FCPF in October 2010. Since 2010 the government has been implementing various activities proposed by the RPP (Dangi, 2013). Apart from forming the national institutional structures for implementing REDD+, the government conducted several studies to support the National REDD+ Strategy, which was finalized in 2015.

Overview of the Sample

The table below presents key descriptive statistics from our sample of 1300 households. These are the variables we use as potential carbon supply function shifters. Respondents were mainly male,

but with a significant minority (34%) of respondents being female. The sample includes a variety of ethnic groups, including *Dalit* (i.e. lowest) castes (16%) and 38% of households are classified as poor or ultra-poor. Virtually all households use fuelwood, but 9% also use biogas and 15% use LPG or improved biomass cookstoves. Virtually all households own some land and 42% say that REDD+ will very likely or extremely likely benefit them personally.

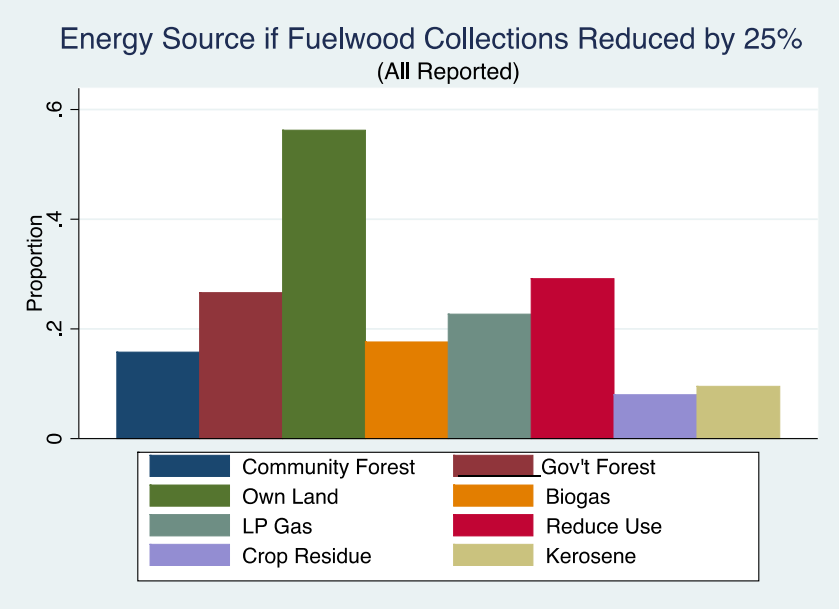
Table S1: Descriptive Statistics of Sample and Potential Carbon Supply Shifters

Variable	Mean	Standard Deviation
Member of CF (1 = yes, 0 otherwise)	0.50	0.50
Respondent age (years)	50.61	13.76
Respondent is female (1 = yes, 0 otherwise)	0.34	0.48
Female-headed households (1 = yes, 0 otherwise)	0.16	0.37
Household size (number of people)	5.96	2.52
Household is classified as poor or ultra-poor (1 = yes, 0 otherwise)	0.38	0.48
Dalit ethnic group (1 = yes, 0 otherwise)	0.16	0.37
Indigenous or Newar ethnic group (1 = yes, 0 otherwise)	0.41	0.49
Brahmin or Chetri ethnic group (1 = yes, 0 otherwise)	0.40	0.49
Madheshi ethnic group (1 = yes, 0 otherwise)	0.02	0.14
Respondent migrated to site from another location (1 = yes, 0 otherwise)	0.25	0.44
Uses biogas (1 = use, 0 otherwise)	0.09	0.29
Uses LPG (1 = use, 0 otherwise)	0.15	0.36
Uses improved biomass cooking stove (1 = use, 0 otherwise)	0.15	0.36
Uses firewood (1 = use, 0 otherwise)	0.95	0.22
Household owns land (1 = yes, 0 otherwise)	0.94	0.24
Walking distance from respondent's house to road < 2 hours (1 = yes, 0 otherwise)	0.70	0.46
Respondent says they are very likely or extremely likely to benefit personally from REDD+ (1 = yes, 0 otherwise)	0.42	0.49
Reported firewood used per month (kilograms)	298.87	394.84
Number of formal CFUGs (number of groups)	1.3	0.73

We now present illustrative information on the possibility for leakage as fuelwood collection restrictions are put in place. This information comes from our household survey. Respondents were directed to indicate all options that would apply, given restrictions of 25%, 50%, 75% and 100%. Figure 1 shows that faced with a 25% fuelwood collection restriction, over half of respondents would shift to fuels produced on their private lands. About 30% would include reductions in their energy

consumption in their response portfolio, about 25% would gather from other forests and substantial portions would shift to biogas and LP gas or gather in CFs. Very limited portions of households would use crop residues, kerosene or dung (not shown).

Fig. 1 Alternative Energy Sources Identified for 25% Fuelwood Restrictions in Respondents' Main Forests



This indicative evidence suggests that a low amount of leakage will occur if a PES scheme to sequester additional carbon were put in place that required fuelwood collection by decreased by approximately 25%. We do not know anything about the amounts they would gather as responses are prospective. It is also striking, though, that so many respondents also point to their own land as an alternative source of fuel. These extractions would presumably not represent leakage as households are likely to manage their biomass resources in their best interests and replant as appropriate to maintain flows thus making extraction from own land carbon neutral. Cleaner fuels like biogas and LPG are also expected to be important fuel sources if REDD+ programs were to be instituted in rural Nepal.

Supplementary Material – S2

Choice Experiment Methods and Analysis

In this paper, we are interested in fuelwood ecosystem services and what level of compensation households would require to give up those services. Choice experiments are ideal for estimating the value of ecosystem services within such frameworks (Boxall et al. 1996, Louviere et al. 2000, Dissanayake and Ando 2014), because they allow the researcher to elicit marginal values for each attribute. Alpizar et al. (2003), Hanley et al. (2001), Hensher et al. (2005), and Hoyos (2010) provide reviews of the choice experiment methodology. The analysis we conduct, to elicit individual coefficients for the preferences for the REDD+ contracts, follows Vincent (2014). We examine preferences for REDD+ contracts in 1300 households in 130 formal and informal forest user groups across Nepal.[2] The sample was developed based on a nationally representative sample of 137 forests analyzed during an evaluation of the Nepal Community Forestry Program (MoFSC, 2013). We randomly chose 65 official community forests (CFs) from this sample and then matched it with 65 communities outside the program so our samples of CFs and non-CFs could be compared; half of respondents are in CFs and half in non-CFs. We limited our sample to communities in the middle hills and Terai regions of Nepal and omitted the high mountain region, which offers limited carbon sequestration potential.

We start with a nationally representative CF sample and matched those areas with a sample of non-CF communities that have similar ecological and socio-economic characteristics. Using this methodology, we are able to draw inferences for rural areas across the country. This sample has been used for a variety of analysis, including examining carbon sequestration effects of CFs (Bluffstone et al., 2018), collective action drivers of carbon sequestration (Luintel et al., 2018) and equity effects of

[2] Comprehensive results from the analysis can be found in Dissanayake et al. (2015), but this paper did not explicitly use the results to analyze carbon supply. We therefore extend our earlier paper here.

the CF program (Luintel et al., 2017), and, as was already mentioned, responses to hypothetical REDD+ contracts (Dissanayake et al., 2015a and Dissanayake et al 2015b), among others.

The attributes were selected through focus group discussions in a total of 18 communities, half CFs and half non-CFs, including both hill and *Terai* regions.[3] These attributes are presented in Table 1. As shown in the table, respondents who were not CF members had four attributes; contract payment denominated per household, percentage of the payment going to the household (as opposed to the community), required reduction in fuelwood and the required reduction in grazing. The grazing restriction attribute was not included in choice experiments for those who are members of CFs, because CF's virtually always have grazing restrictions in place. An important implication of having different choice experiments for CF member and nonmember households is that these samples must be analyzed independently; we therefore do not pool the data.

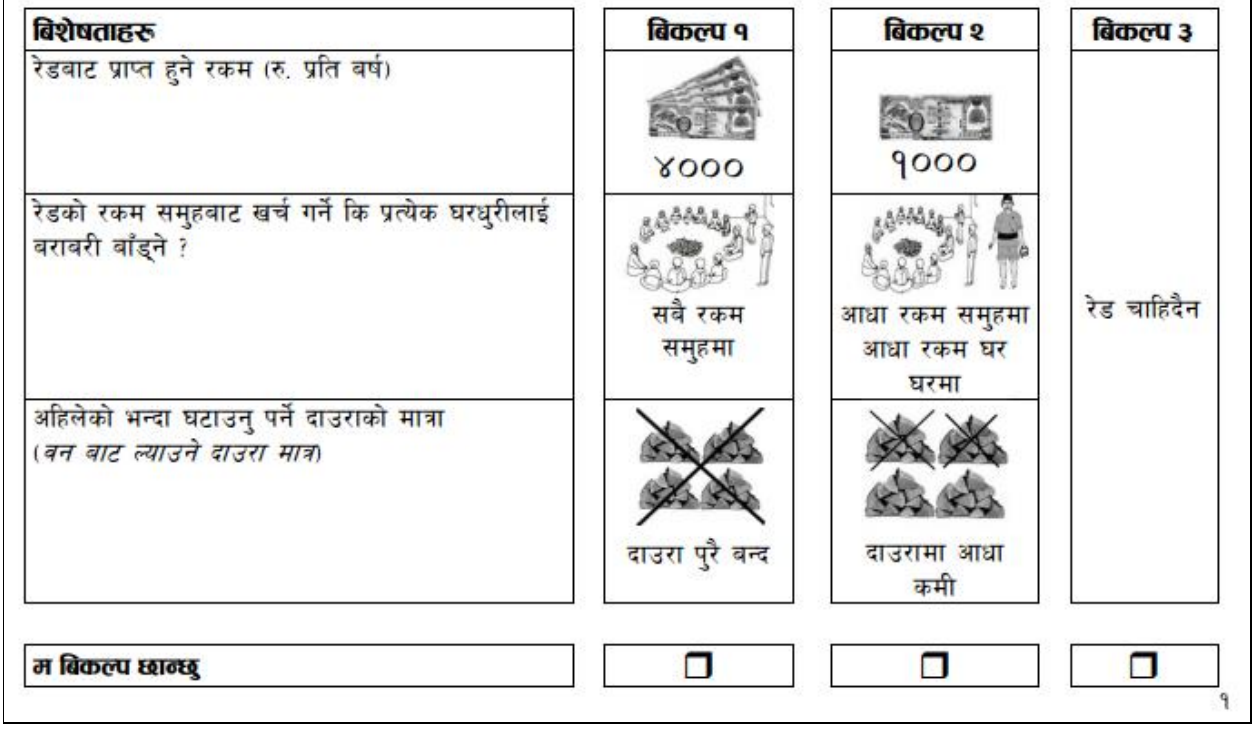
Table S2 -1: Attributes and Levels in the Choice Experiment

Attributes	Description	Levels
REDD + payments (Rs. per household per year)	Annual total REDD+ payment to your community.	• Rs. 1000 • Rs. 2000 • Rs. 3000 • Rs. 4000 • Rs. 5000
Portion of the REDD+ payment going to the household.	The portion of REDD+ payments that go to communities for community projects and /or equally divided between households in your group.	• 100% community • 50% community and 50% household • 100% household
Reduction in amount of fuel wood collected	Required fuelwood reduction measured as a portion of your current use.	• 25% • 50% • 75% • 100%
Only Households who are Not CF Members		
Grazing restrictions (only for non-CF households)	Open grazing is prohibited	• Yes • No

[3] The attributes were refined after examining the REDD+ literature and analyzing focus group results. Lancaster (1966) was one of the first to suggest that consumers get benefits from the characteristics of services rather than services themselves. Choice experiments can therefore be considered analogous to hedonic pricing, except for a stated preference setting. As is the case with all experimental methods, hypothetical bias and lack of external validity are potentially important concerns (e.g. see Carlsson, F. and P. Martinsson, 2001).

Once an initial list of attributes was developed, we pretested the instrument with potential respondents and generated choice sets using an efficient experimental design following Kuhfeld (2010). Details of the experimental design and choice set generation are provided in Dissanayake et al. (2015a). The final choice experiment contains background information about the REDD+ program, a description of the attributes and levels, seven choice sets, and a small demographic questionnaire. The preamble and information provided to the respondents are included at the end of this supplementary information section. Figure S2-1 presents an example of a choice set, with the first row showing the payment, the second presenting the distribution of the payment (100% household, 100% community and 50:50) and the last indicating the required fuelwood reduction. All attributes are depicted pictorially as well as numerically/using-text, because many respondents were illiterate.

Figure S2-1 Example of One Choice Set for CF Member Households in Nepali Language



Following the more recent literature in choice experiment estimation, we use a mixed multinomial logit model (MMNL)[4] that incorporates heterogeneity of preferences and relaxes the IIA assumption in addition to the conditional logit model (Hensher and Greene 2003, Carlsson et al. 2003, Dissanayake 2014). Assuming a linear random utility model, the utility gained by person *q* from alternative *i* in choice situation *t* is given by

$$U_{qit} = \alpha_{qi} + \beta_q X_{qit} + \varepsilon_{qit} \quad (1)$$

where X_{qit} is a vector of non-stochastic explanatory variables. The parameter α_{qi} represents an intrinsic preference for the alternative (also called the alternative specific constant, ASC). In this setting the unconditional choice probability for individual *q* is given by

$$P_q(\Omega) = \int L_q(\beta) f(\beta \mid \Omega) d\beta \quad (2)$$

where the density of β_q is given by $f(\beta \mid \Omega)$, the true parameter of the distribution is Ω and the conditional choice probability of individual *q* choosing alternative *i* in choice situation *t* is $L_q(\beta_q)$. We estimate the model using the mixlogit command in STATA (Hole 2007).

Given that the mixlogit model identifies a distribution for each parameter, it is possible to use the results to generate individual levels coefficients. We do so by following Revelt and Train (2000), Hensher and Green (2003), Hole (2007), and Vincent (2014) and calculate the likelihood of a respondent choosing a specific set of choices from a set of alternatives. It is important to note that the individual estimates we generate are the conditional means of the coefficient distribution for the respondents who made identical choices when faced with the same choice set (Campbell et al. 2006;

[4]Also referred to as the mixed logit, hybrid logit, random parameter logit, and random coefficient logit model.

Hole 2007). The expected value of β_q conditional on a given response pattern *p* and a set of alternatives *a* is given by

$$E[\beta \mid p_q, a_q) = \frac{\int \beta \prod_{t=1}^{T} \prod_{i=1}^{I} \left[\frac{\exp(\alpha_{qi} + \beta_q X_{qitq})}{\sum_{j \in J} \exp(\alpha_{qj} + \beta_q X_{qjt})} \right]^{p_{qit}} f(\beta \mid \Omega) d\beta}{\int \prod_{t=1}^{T} \prod_{i=1}^{I} \left[\frac{\exp(\alpha_{qi} + \beta_q X_{qitq})}{\sum_{j \in J} \exp(\alpha_{qj} + \beta_q X_{qjt})} \right]^{p_{qit}} f(\beta \mid \Omega) d\beta} \quad (3)$$

The value of $E[\beta \mid p_q, a_q)$ can be approximated using simulation and we use the *mixlbeta* command in STATA to derive the individual parameter estimates (Hole 2007). For the results included in the text of the paper, we assume the preferences for attributes are the payment vehicle and fuelwood reduction attributes are random and lognormally distributed. This assumption assures that willingness to accept compensation for fuelwood reductions are always positive. As robustness checks, we present results that assume attributes are normally distributed (Supplementary Information S4). As the findings are not appreciably different from those presented in the paper, we only briefly mention these results in the text.

Choice Experiment Preamble Read to Respondents

Introduction to Climate Change and REDD+

I would like to ask you to participate in a brief survey to understand what you like and dislike about a possible agreement between your community and international organizations. This agreement would focus on your community forest [*mention the name of the CFUG/non-CFUG here*]. As you might know, the climate is changing. The climate of the earth on average is becoming warmer and weather patterns are changing. This climate change is caused by carbon pollution into the atmosphere from factories and vehicles mainly in the richer countries like Japan, United States of America and Europe [*show and discuss the RECOFTC graphic on climate change*]. As a result of international agreements that were first made about 20 years ago, these rich countries and others are responsible to reduce their carbon emissions. These countries are finding it difficult to reduce their emissions and the world climate has therefore continued to change. This climate change is considered a serious problem.

To help with, or in addition to, the efforts to reduce the amount of carbon that the rich countries are emitting, an international program was created to use the abilities of forests to store carbon to help reduce climate change. As you may know, trees grow by combining solar energy, water and carbon from the atmosphere. Healthy forests therefore actually remove carbon from the atmosphere, which helps the climate *[show and discuss RECOFTC graphic on carbon sequestration]*.

Money has been collected from richer countries for the purpose of reducing deforestation and forest degradation in low-income countries like Nepal. Using these funds it is expected that international organizations will pay money to governments, individuals and communities like yours to reduce deforestation, improve forest quality and capture carbon. This program is called REDD+ *[show and discuss RECOFTC graphics on REDD+]*. The program is voluntary and no communities or individuals in Nepal will be forced to participate.

Do you have any questions about what I've just said? Do you agree to participate? *[Proceed if respondent agrees*]

Experiment Background

There has been no decision to implement REDD+ in your area and to my knowledge there is no plan to do so. It may, however, come to Nepal and it is therefore very important to understand what you and others in your community who use and protect forests would like to see in such agreements. That is why we want to ask you for your views. The choice of whether to participate will be made by you and your fellow forest users. Though you and your neighbors may decide to participate in REDD+, there will be no coercion.

If REDD+ were to come to Nepal, there will be an opportunity for Nepali communities to be paid money to capture carbon from the atmosphere in their forests. There would also be an opportunity for communities to enjoy other benefits from higher quality forests, such as more animals and plants, non-timber forest products and simply the chance to help and protect the forest environment.

REDD+ agreements would be between international organizations interested in stopping climate change and the Government of Nepal. The Government would then make an agreement with your community, with active involvement of and some oversight by international organizations. The agreement will specify the responsibilities your community takes on, such as reductions in fuelwood collections and open grazing elimination (if appropriate). All these steps can improve forest quality and increase carbon sequestration. Progress will need to be monitored and verified every year. You may also need to make work and money contributions to your forest user group community in addition to what you are currently doing.

The agreement will also specify the payment in rupees that will be made each year and will detail how those resources can be used. For example, resources coming to the community may be used for community development projects like children's education, health and community recreation. They might also be used to fund household or individual projects administered by the community like support for income generation activities, installation of biogas digesters, purchase of tractors or use of improved seeds and fertilizers.

Alternatively, resources (or some part) could be divided equally among households in your group. Each household might therefore receive an equal share of the annual REDD+ payment and those funds could be used as each household prefers.

If you are part of a community forest user group (CFUG), this REDD+ agreement would be with the CFUG. If you have not established a CFUG, to participate in REDD+ and receive payments for increasing carbon in your forest you will need to establish a CFUG.

As of now, there are no specific activities related to forest management that focus on REDD+. To participate in REDD+, your CFUG would need to develop or revise its forest management plan to increase carbon sequestration. Monitoring and verification would also need to be included in such plans and as I mentioned, a formal agreement would be developed. The government, probably through the District Forestry Office, with financial resources from international organizations, would provide training and financial support to help you develop these plans. Because international organizations are providing the REDD+ funds, there will be good and open record-keeping, which will help control any potential mismanagement of community funds. The participation of such international organizations will also contribute to more equitable distributions of benefits among community members.

We emphasize that the main responsibility for organizing the CFUG and its members to meet REDD+ requirements and distribute rewards will be with you and your neighbors. If you and your community would like to participate in REDD+, any conflicts or controversies within your community that block the making and implementation of a REDD+ agreement will need to be resolved. If you and your neighbors would like additional support, depending on the capacity, availability and goodwill in the District Forestry Office, help may be available with organizing your CFUG (if needed) or to improve its operation.

We will now ask you to make 6 choices among possible REDD+ contracts. Each choice will have three options, one of which is the current situation with no REDD+. These options are described by the following attributes:

Annual total REDD+ payment to your community. *These amounts are presented as rupees per household (to calculate the total payment, multiply the per household amount by the number of households in your community)*
The portion of REDD+ payments that go to communities for community projects and /or equally divided between households in your group *The word after the word "community" is the portion going to communities and the word after the word "households" is the portion to households like yours.*
REDD+ required fuelwood reduction measured as a portion of your current use
Open grazing is prohibited or not *(for non-CFUGs only)*

Do you have any questions?

Choice Sets

Choice Set Non-CF Households

Attribute in English	**Possible Levels by Level number**
Annual total REDD+ payment to your community. *These amounts are presented as rupees per household (to calculate the total payment, multiply the per household amount by the number of households in your community)*	1. Rs. 1000 2. Rs. 2000 3. Rs. 3000 4. Rs. 4000 5. Rs. 5000
The portion of REDD+ payments that go to communities for community projects and /or equally divided between households in your group *The word after the word "community" is the portion going to communities and the word after the word "households" is the portion to households like yours.*	1. Community None, Households All 2. Community Half, Households Half 3. Community All, Households None
Required fuelwood reduction measured as a portion of your current use	1. One-quarter 2. One-half 3. Three-Quarters 4. All
Open grazing is prohibited	1. Yes 2. No

The exchange rate at the time of the experiment was RS. 85/$US

Choice Set CF Households

Attribute in English	**Possible Levels by Level number**
Annual total REDD+ payment to your community. *These amounts are presented as rupees per household (to calculate the total payment, multiply the per household amount by the number of households in your community)*	1. Rs. 1000 2. Rs. 2000 3. Rs. 3000 4. Rs. 4000 5. Rs. 5000
The portion of REDD+ payments that go to communities for community projects and /or equally divided between households in your group *The word after the word "community" is the portion going to communities and the word after the word "households" is the portion to households like yours.*	1. Community None, Households All 2. Community Half, Households Half 3. Community All, Households None
Required fuelwood reduction measured as a portion of your current use	1. One-quarter 2. One-half 3. Three-Quarters 4. All

The exchange rate at the time of the experiment was RS. 85/$US

Supplementary Material – S3: Estimation of Marginal Effects

These marginal effects are the willingness to accept payment (in Nepali Rupees) for a one-percent reduction in fuelwood collections from common forests. We use the percentage reduction metric, in contrast to a pure quantity-based measure, because it is relevant to all households regardless of their circumstances. It is also true, though, that different households have different family sizes, food consumption patterns, live at different altitudes, exist in environments of different qualities and characteristics, etc. They therefore will have different meanings of one-percent reductions. We address this issue below.

Choice experiments only produce a single estimated WTA, value for each household. To examine small reductions that are greater than 1%, we must assume homothetic preferences for cash (in the form of REDD+ payments) and fuelwood collections up to the fuelwood collection reduction percentage required by the simulated program. This implies that if we increase the total payment by a given percentage, households will reduce their fuelwood collections by this same percentage.

This assumption, which is necessitated by our use of the choice experiment methodology, therefore implies a scaling of the payment and response by the same factor. It also implies that each household's willingness-to-accept per ton of fuelwood reductions is unresponsive to the level of the reduction program. Our carbon supply function estimates are therefore conservative (i.e. less reduction generated for a given payment), because in reality we would expect that individual households require higher prices to supply more carbon reductions; this is consistent with standard increasing marginal cost if greater levels of carbon sequestration are to be supplied, which we expect not only across households as we analyze here, but also within households. Because we assume that household-level opportunity cost functions are constant, we do not also assume those estimates apply to highly non-marginal fuelwood reductions.

We therefore discuss our results in two ways. First, we present the proportion of households who are willing to participate in a hypothetical REDD+ fuelwood reduction program at various prices. We then simulate the quantity effects for a hypothetical nationwide program that reduces fuelwood collections by 25% from current levels, assuming constant household-level marginal costs.

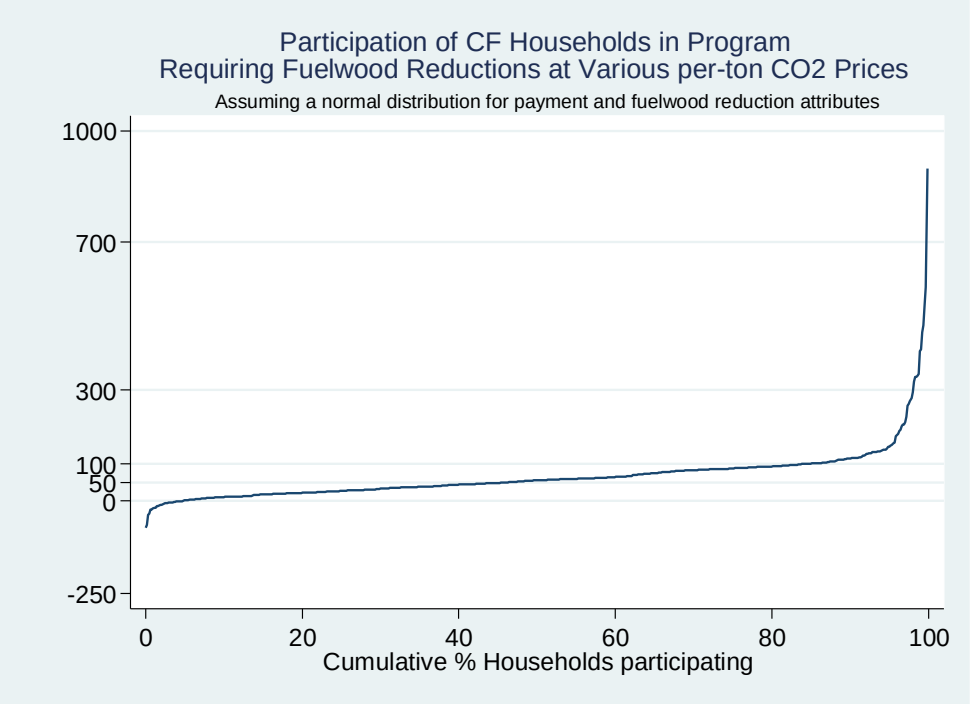
Though a percentage reduction will have relevance to all respondents, people will have different meanings of one-percent reductions.[5] We ideally would like to customize these meanings to each household. Our data indeed include information on average monthly fuelwood consumption and across our sample we find that the average fuelwood consumption is reported to be 298 kilograms per month. Only 3/4 of our sample respondents reported their fuelwood consumption, however, and we are concerned that those who did not provide information may differ systematically from those who provided information. We also worry that consumption may differ from fuelwood collections, which is our interest in this paper. For example, some households may buy fuelwood, which would cause collections and consumption to differ.

Therefore, to create a standard meaning of a one-percent reduction in fuelwood collections, we utilize a nationally representative estimate from the literature. We argue that this approach is appropriate, because our communities are randomly chosen from a nationally representative random sample, with half CFs and half non-CFs, half of which are in the hills and half in the *Terai*, which are the two most important and relevant stratification dimensions. Households within communities are also chosen randomly, so the moments of the sample should be representative of the population. Using these features of our sampling frame, we assume that a one-percent fuelwood collection reduction in our sample on average has the same meaning as a one-percent reduction in average, national, rural household fuelwood collections.

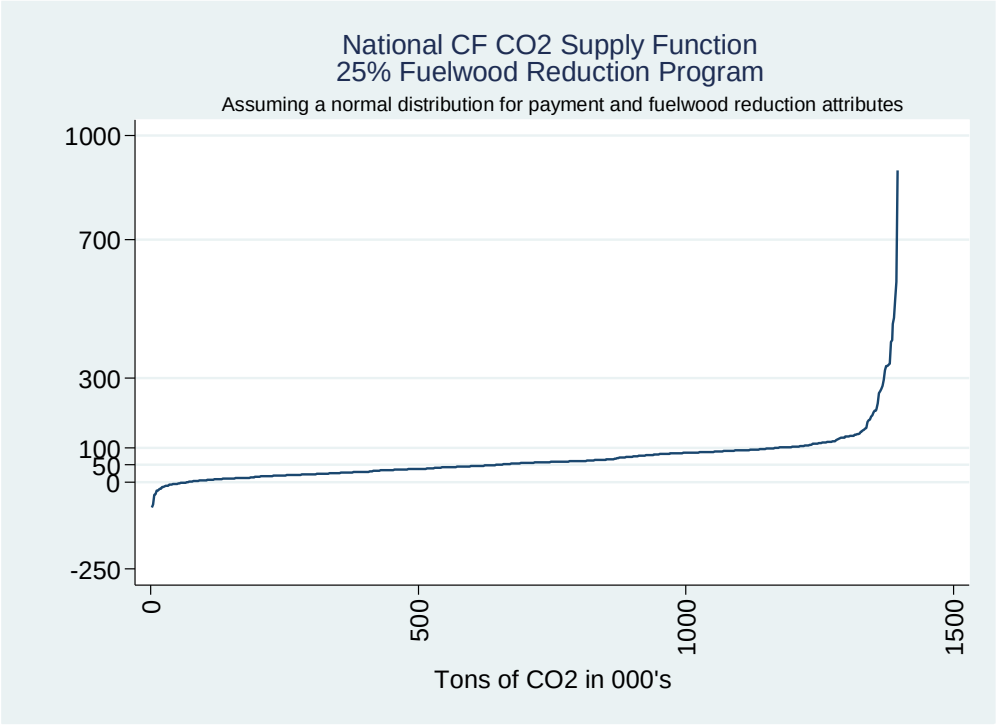
[5] This is not unique to our analysis, but is inherent in all carbon forestry PES programs implemented in primarily subsistence agriculture settings.

Supplementary Material – S4: Robustness Checks

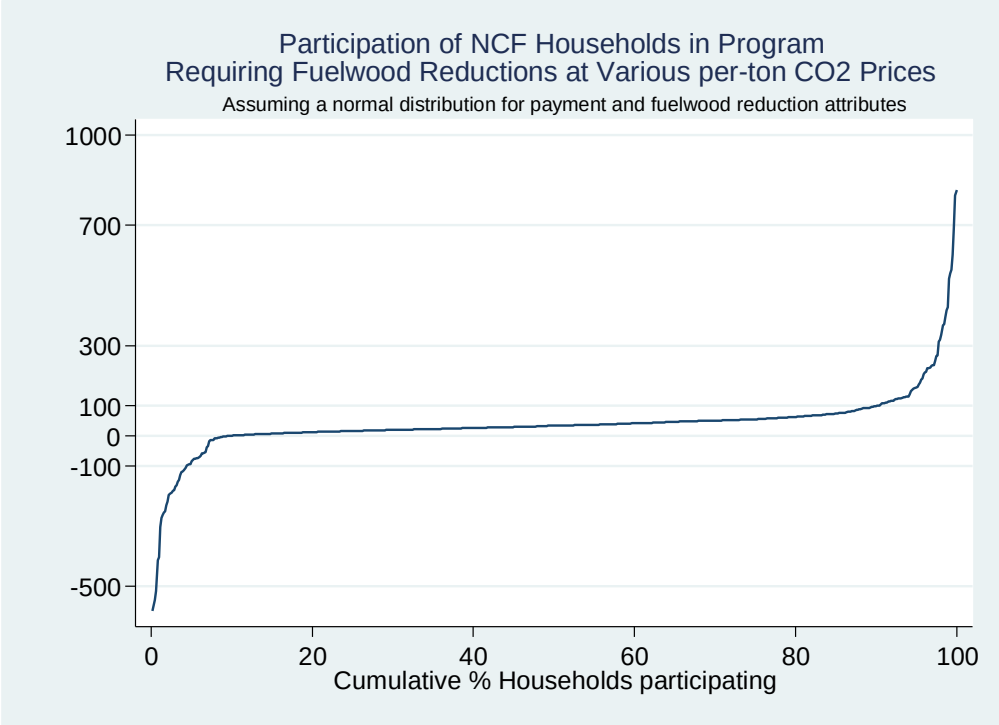
Participation in REDD+ Program and Estimated CO_2 Sequestration Costs at Various Prices



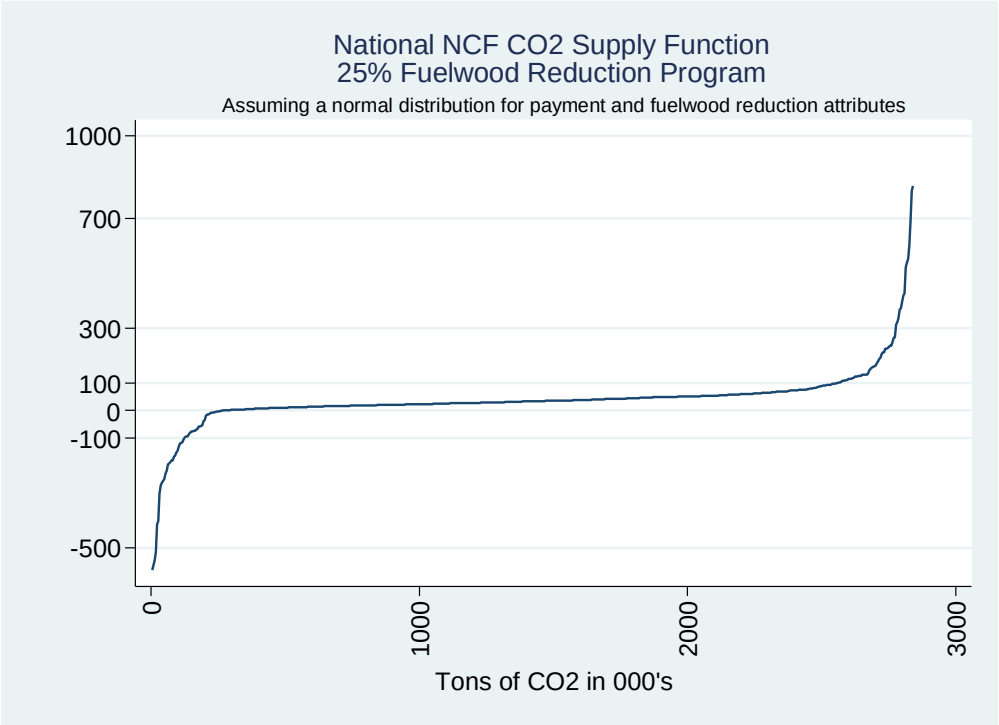
N=644. 2 Observations with estimated WTA < -$1000 trimmed as extreme values. No WTA values >$1000.



N=644. 2 Observations with estimated WTA < -$1000 trimmed as extreme values. No WTA values >$1000.



N=637. 12 Observations with estimated WTA < -$1000 or WTA > $1000 trimmed as extreme values.



N=637. 12 Observations with estimated WTA < -$1000 or WTA > $1000 trimmed as extreme values.

Supplementary Material – S5: OLS Regressions of Potential Supply Shifters

OLS Regression of Potential Supply Shifters on Marginal WTA (in Nepali Rupees) of Non-CF Households to Participate in REDD+ Program Requiring Reduction in Fuelwood Collections

Variable	Regression Coefficient	P Value
Respondent age (years)	0.93	0.38
Respondent is female (1 = yes, 0 otherwise)	-20.24	0.56
Female-headed households (1 = yes, 0 otherwise)	16.98	0.76
Household size (number of people)	12.24*	0.09
Household is classified as poor or ultra-poor (1 = yes, 0 otherwise)	47.78	0.17
Dalit ethnic group (1 = yes, 0 otherwise)	-5.59	0.89
Indigenous or Newar ethnic group (1 = yes, 0 otherwise)	20.92	0.59
Madheshi ethnic group (1 = yes, 0 otherwise)	19.86	0.70
Respondent migrated to site from another location (1 = yes, 0 otherwise)	-20.99	0.52
Uses biogas (1 = use, 0 otherwise)	-73.20*	0.03
Uses LPG (1 = use, 0 otherwise)	48.95	0.35
Uses improved biomass cooking stove (1 = use, 0 otherwise)	11.30	0.83
Uses firewood (1 = use, 0 otherwise)	10.60	0.78
Household owns land (1 = yes, 0 otherwise)	-34.11	0.54
Walking distance from respondent's house to road < 2 hours (1 = yes, 0 otherwise)	-22.47	0.55
Respondent says they are very likely or extremely likely to benefit personally from REDD+ (1 = yes, 0 otherwise)	-9.94	0.62
Reported firewood used per month (kilograms)	-0.04	0.39
Number in formal CFUGs (number of groups)	-4.53	0.81
Constant	91.93	0.41

***, **, * indicate significant at 1%, 5% and 10% levels. N= 608, R^2=0.023, F=1.77, prob>F=0.05
Assumes normally distributed payment vehicle and fuelwood reduction attributes

OLS Regression of Potential Supply Shifters on Marginal WTA (in Nepali Rupees) of CF Member Households to Participate in REDD+ Programs Requiring Reduction in Fuelwood Collections

Variable	Regression Coefficient	P Value
Respondent age (years)	-1.53**	0.03
Respondent is female (1 = yes, 0 otherwise)	7.44	0.77
Female-headed households (1 = yes, 0 otherwise)	59.72**	0.03
Household size (number of people)	12.53***	0.01
Household is classified as poor or ultra-poor (1 = yes, 0 otherwise)	18.64	0.41
Dalit ethnic group (1 = yes, 0 otherwise)	-32.12	0.34
Indigenous or Newar ethnic group (1 = yes, 0 otherwise)	0.47	0.99
Madheshi ethnic group (1 = yes, 0 otherwise)	-59.49	0.26
Respondent migrated to site from another location (1 = yes, 0 otherwise)	-45.76**	0.05
Uses biogas (1 = use, 0 otherwise)	-36.32	0.39
Uses LPG (1 = use, 0 otherwise)	-41.69*	0.07

Uses improved biomass cooking stove (1 = use, 0 otherwise)	72.14	0.11
Uses firewood (1 = use, 0 otherwise)	-106.97	0.22
Household owns land (1 = yes, 0 otherwise)	-143.40**	0.05
Walking distance from respondent's house to road < 2 hours (1 = yes, 0 otherwise)	20.30	0.55
Respondent says they are very likely or extremely likely to benefit personally from REDD+ (1 = yes, 0 otherwise)	-52.96***	0.00
Reported firewood used per month (kilograms)	0.00	0.81
Number in formal CFUGs (number of groups)	-20.52	0.25
Constant	690.69***	0.00

Assumes lognormal payment and fuelwood reduction attributes
***, **, * indicate significant at 1%, 5% and 10% levels. N= 600, R^2=0.10, F= 2.74, prob>F=0.0018

OLS Regression of Potential Supply Shifters on Marginal WTA (in Nepali Rupees) of Non-CF Households to Participate in REDD+ Program Requiring Reduction in Fuelwood Collections.

Variable	Regression Coefficient	P Value
Respondent age (years)	-1.31*	0.06
Respondent is female (1 = yes, 0 otherwise)	0.55	0.98
Female-headed households (1 = yes, 0 otherwise)	12.97	0.62
Household size (number of people)	3.94	0.30
Household is classified as poor or ultra-poor (1 = yes, 0 otherwise)	2.71	0.89
Dalit ethnic group (1 = yes, 0 otherwise)	-9.72	0.66
Indigenous or Newar ethnic group (1 = yes, 0 otherwise)	-14.32	0.51
Madheshi ethnic group (1 = yes, 0 otherwise)	-33.73	0.29
Respondent migrated to site from another location (1 = yes, 0 otherwise)	-8.13	0.64
Uses biogas (1 = use, 0 otherwise)	-42.74*	0.07
Uses LPG (1 = use, 0 otherwise)	-34.32*	0.08
Uses improved biomass cooking stove (1 = use, 0 otherwise)	-40.14	0.11
Uses firewood (1 = use, 0 otherwise)	64.88***	0.01
Household owns land (1 = yes, 0 otherwise)	-26.25	0.50
Walking distance from respondent's house to road < 2 hours (1 = yes, 0 otherwise)	-0.40	0.99
Respondent says they are very likely or extremely likely to benefit personally from REDD+ (1 = yes, 0 otherwise)	-26.24**	0.02
Reported firewood used per month (kilograms)	-0.01	0.72
Number in formal CFUGs (number of groups)	10.30	0.42
Constant	287.99***	0.00

Assumes lognormal payment and fuelwood reduction attributes
***, **, * indicate significant at 1%, 5% and 10% levels. N= 618, R^2=0.03, F=1.76, prob>F=0.05

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