

Using Behavioral Science to Increase Women's Participation in Natural Resource Management in Mexico

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Abstract

Natural resources management (NRM) helps protect forests and promote sustainable development. Although women are key in strengthening activities in NRM, they are dramatically underrepresented in public funding for forest projects in many countries, such as Mexico, limiting their participation and impact. While structural barriers, such as land tenure and low capacity, cause this problem, this is exacerbated by barriers such as lack of information, complex application processes, gender norms, and rural women's low aspirations and limited agency and self-efficacy to participate in NRM projects. This paper tests whether additions and modifications to the standard outreach strategies of a call for proposals for NRM grants in Mexico increase the number of applications submitted by localities and the share of women participating. The study uses a randomized controlled trial in 113 rural localities, where the standard outreach approach (control) is complemented with additional information channels and simplified materials (treatment 1), aiming to appeal more directly to inexperienced populations. A second treatment

group further modifies the informational materials using insights from behavioral science (loss aversion, norms framing, and others) and adds proactive text message reminders to prompt behavior (treatment 2), hoping to address the barriers to women's participation. The results suggest that treatment 1 localities had, on average, 2.3 more applications per locality than the control group (increasing the participation of both men and women). Treatment 2 complemented this, having, on average, 6.4 more women per locality participating of these applications than in treatment 1. This shows that women manifested interest in participating in these activities. A representative survey of women in the study localities (1,485 women in 52 localities) suggests that women in treatment localities were more likely to recognize the name of the project or informational materials. The analysis also suggests that the complementary strategies had no effect on the likelihood of being selected to receive a grant under the project, suggesting that additional support is needed to translate this increased interest into successful applications that would allow participation in NRM.

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1. Introduction

Women have always been involved in natural resources management (NRM) and they have a central role in the use of NRM because they are frequently in charge of household cooking and firewood collection (Beland et al., 2010), and are crucial in providing nutritious diets and food security to their families (Kimanzu et al., 2021 and Agarwal, 2018). However, women's access to the benefits of natural resources (for example, wood, food, economic benefits) is limited compared to men's (Marcos, P, 2021 and FAO, 2018). Moreover, social, political, and economic inequalities result in differences in men's and women's adaptive capacity and resources to face climate change, and climate change further impacts access, use, and control over resources (World Bank, 2018).

According to Marcos (2021), not involving women in NRM projects can reduce their effectiveness by: i) producing a negative impact on women's and their families' livelihoods; ii) marginalizing women's specific and necessary knowledge (for example, traditional knowledge); iii) strengthening inequalities in participation and influence in decision making; and iv) worsening relations between men and women, mainly when social and economic benefits are not equally distributed. However, if a gender approach is implemented in the project, it can serve to improve project sustainability. Specific efforts should be made to ensure that gender is an integral part of future initiatives (Larson et al., 2018).

In Mexico, forests contribute to both rural and urban economies through the provision of goods such as timber and value-added products, and important ecosystem services. These natural habitats support biodiversity, mitigate erosion, and help maintain soil fertility, water filtration, and the supply of raw material for vital, productive sectors (Armstrong, Siegmann, Alonso Mendieta, Reyes-Retana, 2018). However, the sustainability of Mexico's forests is threatened by socioeconomic stresses, unsustainable agricultural practices, and climate change (CONAFOR, 2020). Drought, irregular rainfall, deforestation, and the degradation of natural resources all increase the risk of natural disasters and the loss of biodiversity (Armstrong, Siegmann, Alonso Mendieta, Reyes-Retana, 2018).

Many of the people living in these forests are poor and vulnerable: 88% of Mexico's 12 million forest dwellers live in highly marginalized localities, and 62% live below the poverty line (INEGI, 2009; DOF, 2016). At the same time, 60% of forests in Mexico are property of communal organizations, with authorization to use the forest resources (Madrid, Núñez, Quiroz and Rodriguez, 2009). Hence, promoting impactful sustainable practices through community forest management provides an important opportunity to sustain forest resources while enabling local populations to create income generating opportunities.

A persistent gender gap exists in productive activities in forest landscapes, the distribution of benefits from these activities, and the associated public sector programs. For example, while important efforts have been made to provide more funding to women in Mexico, in 2020 only 1.15% of the resources of the main forest sector support program funded productive projects led by women. At the same time, according to the Agrarian National Registry, only 26% of all ejido

and community rights holders (ejidatarias and comuneras¹) are women. Hence, governmental forest support programs targeting ejidos and communities mainly benefit men.

Myriad structural barriers limit women's involvement in forest sector programs. These institutional, legal, and economic barriers include longer working hours, poor public infrastructure to travel to submit official documents, weaker social status, poverty, lack of land tenure, and differences in health and educational attainment as compared to men (World Bank, 2018). Although these have been identified in previous research, there is incomplete evidence on the social and psychological aspects associated with gender differences in participation. Integrating an analysis with a behavioral sciences lens can help cover this knowledge gap.

In recent years, behavioral sciences have provided a complementary perspective to explain public policy challenges beyond institutional, legal, and economic barriers. Behavioral barriers—often unconscious and driven by biases, social norms, and mental models—are now increasingly taken into consideration in the design and implementation of public programs (Sanders, Snijders & Hallsworth, 2018; Shafir, 2013; World Bank, 2014). Behavioral science provides insights to design programs addressing how decision-making is influenced by mental shortcuts (i.e., thinking automatically), psychological biases, and mental models (i.e., predefined views and interpretation of ourselves and the world around us).

This paper presents the results of a Randomized Controlled Trial (RCT) that tested additions to an outreach strategy of a call for proposals to fund Natural Resource Management (NRM) initiatives in Mexico, particularly using simplified information, expansion of communication channels and messages informed by behavioral sciences. The intervention was designed to encourage women to engage in these activities, helping understand further whether communication strategies that address behavioral barriers can increase their engagement.

2. Evaluation design

2.1 Policy context

In order to test strategies to encourage women to apply for NRM programs' funding, this study took advantage of a call for proposals for NRM activities in Mexico that was funded by a World Bank (WB) project. The project had a focus on funding sustainable productive activities in forest landscapes proposed by indigenous people to improve community livelihoods, increase community participation, and support local climate change action. This specific call for proposals aimed to increase women's participation in NRM activities by addressing a series of structural barriers that commonly prevented women from being able to apply to forest sector programs. For example, removing the land ownership requirement and having a two-phase process, requiring only a short project description for the first phase with fewer technical and methodological details

¹ Agrarian units (*Nucleos agrarios*) can be *comunidades* or *ejidos*. *Comunidades* are long-standing rural population centers with formal ownership of their traditional or customary lands. *Ejido* refers to a portion of land titled to a rural population nucleus that was formed more recently or relocated from another area. Community members with full ownership rights are legally recognized as ejidatarios or comuneros. Both types of community groups are governed by a similar structure. *Avecindados* refers to people who live in the territory without being ejidatarios or comuneros.

and having a second phase to develop full proposals that included specialized technical assistance. For this evaluation, we focus on the initial proposal submission of phase one. The call for proposals was announced in August 2018 and the deadline to submit phase one applications was at the end of March 2019.

Even though the call for proposals already addressed several structural barriers in the design, additional behavioral barriers were identified in a qualitative study with rural women in Mexico (World Bank, 2018) conducted previous to the current evaluation. The qualitative study (World Bank, 2018) identified: (i) scarcity of time and choices for women, given household chores and the limited activities they can take part in as a result of them; (ii) gender norms and stereotypes that default women to traditional gender roles, limiting their motivation, self-efficacy, self-advocacy, and aspiration to participate in new activities; (iii) process complexity in learning about and applying to the call for proposals, which, if simplified, could encourage unexperienced populations, particularly rural women, to sign up for productivity programs; and (iv) the importance of trustworthy agents of change, such as communal leaders or role models, in building engagement among women and men.

The WB project did not have the resources to apply additional strategies to address these barriers in all localities, which worked as an opportunity to conduct a RCT aimed at testing whether these would increase women's participation in NRM programs.

2.2 Randomized controlled trial

We utilized an RCT with three experimental groups to compare outreach strategies at the locality level that aimed to increase the number of application submissions coming from each locality, with an emphasis on increasing women's participation in the applications. Even though there were many complementary outreach strategies used to address the barriers previously mentioned, we did not have enough resources to test all possible combinations. Hence, we had to combine multiple strategies across two treatment groups (plus an active "business-as-usual" control group), as explained below. Table 1 summarizes the strategies used in each experimental group and the hypotheses underlying each addition, even though we were not able to test each hypothesis independently. Each treatment group mostly *added* strategies rather than replacing them (i.e. localities in T1 had access to all activities from T0, and localities in T2 had access to all activities from T1 and T0), allowing us to test the *additional* effect of the included strategies.²

² This RCT adheres to the principles in the Belmont Report of respect for persons, beneficence, and justice. Inhabitants of all participating localities had full autonomy to decide whether or not to apply to the NRM program or participate in activities. The official outreach strategy covered all localities and no treatment left participants in a worse status.

Table 1. Main hypotheses and components in each experimental group.

Experimental Group	Hypothesis	Outreach strategy added to experimental group
Active Control (T0)	<i>No hypothesis - "Business-as-usual" standard outreach strategy</i>	Standard outreach strategy
T1 (T0 +)	Simplifying the information and forms that potential applicants receive will encourage less-experienced people and those living in scarcity to apply by reducing the cognitive investment needed to get informed (i.e., understand) and apply.	The information presented in the meetings, flyers, posters and forms were simplified with a more direct language and examples.
	Reaching out directly to potential participants in their own locality will encourage less-experienced/aware people and those living in scarcity to apply by reducing the investment needed to get informed and apply (e.g., no commute needed, easier to learn about program).	Two additional meetings performed in each locality by local allies. Hanging posters in important buildings of their localities. Audio messages in megaphones in localities with information about call for proposal.
	Creating additional easy-to-reach and familiar communication channels to get questions answered will encourage less experienced people to apply by increasing the opportunities to solve doubts.	Established a RCT specific helpline that people could reach via phone, text message or WhatsApp.
	Providing trustworthy and/or more relatable agents will improve communication.	Use of local allies for meetings in locality and provide name of agent in helpline
T2 (T1 +)	Providing active reminders and clear steps to follow will increase the likelihood that people already motivated to apply will follow through their intentions (closing intention-to-action gap).	Proactive 37 SMS/WhatsApp reminders were sent and a 1-page checklist with key steps were provided to people that attended (and signed in) during additional meetings of T1.
	Applying behavioral science insights of loss-aversion, providing positive gender norms, and appealing to women's identity will encourage more women to get informed and apply by normalizing and directly encouraging their participation.	Posters and flyers from T1 were additionally modified to include references to women's roles and identities (e.g., "your families and children will benefit", normalized participation of women (e.g., "many women have already applied"), and with loss aversion framing ("don't lose the opportunity").

Note: (i) This table summarizes the hypotheses underlying each strategy addition, even if we were not able to test each hypothesis independently because of budget constraints and the need to combine multiple strategies in two groups; (ii) Localities in T1 and T2 still had access to all meetings and materials from T0 through regular channels. T2 had access to all activities in T1 (and T0), but T1 posters and flyers were modified in this group to incorporate behavioral science insights.

The active control group (T0) corresponded to a 'business as usual' model. Localities in this group received the standard dissemination for the call for proposals designed by the implementing agency in charge of the World Bank project. As noted earlier, this call for proposals targeted marginalized groups that are usually under-represented in forest sector programs and made some adjustments focused on increasing inclusion. This outreach strategy focused on targeting local governance through communal leaders so they could liaise with their communities to participate. The expectation was that this approach would encourage a more participatory development of the applications, involving the entire community. It included an inclusive communication strategy featuring dissemination through partner organizations, radio, and community leaders. The strategy included posters; brochures; central meetings in larger localities, which smaller localities in the area were invited to attend; information on the official website; social networking; and engagement through civil society organizations and universities. In the meetings, the project's representatives presented the characteristics of the initiative, the phases, and the requirements for the application. Community leaders were encouraged to invite women from their localities.

Attendees were given posters and brochures to distribute in their localities, and, when requested, were given contact information of the officials conducting the meetings for future questions.

Localities in all three experimental groups had access to this standard outreach effort. However, localities in T0 received *only* this information, and not the activities described below.³

Treatment Group 1 (T1) had access to the same standard outreach strategies and materials as T0 localities, but it additionally received materials with simplified information and formatting of the call for proposals, as well as additional communication channels. As the qualitative diagnostic study showed the importance of reducing the ‘hassle factors’⁴ that people faced when attempting to access and understand information, this treatment delivered new material where information was presented with less text and using examples and familiar and easy-to-understand terms. In addition, the application forms that localities in T1 had access to were simplified by using more direct and less technical language and included examples. All materials and information used in the intervention were tested in the field prior to finalizing them. These localities also had access to additional communication channels in order to better reach potential applicants, especially those less experienced and motivated or living with time scarcity or poverty: (i) two additional meetings, one informative meeting and one follow-up meeting, with local allies in each locality (local allies were 13 people with previous experience in the region and identified through local civil society organizations to support these activities); (ii) before meetings, local allies requested authorities to hang posters and audio-messages through megaphones in public spaces of the locality that explained the steps to participate in the call for proposals; and (iii) access to a helpline through phone, text messages (SMS) or WhatsApp to answer general questions throughout the application process.

Treatment Group 2 (T2) localities received the same intervention as T1 (T0 + simplification and additional communication channels), and in addition they were exposed to: (i) modified posters from T1 with messages designed to leverage insights from behavioral sciences literature,⁵ such as mentioning aspects of their identity as women and role as mothers when arguing the importance of participating; messages and images normalizing the participation of women in activities outside their home, setting an example of accepted behavior and challenging a social norm; and posters and text messages using loss aversion framing by telling potential participants not to miss out on the opportunity to participate; (ii) up to 37 SMS/WhatsApp messages with reminders and encouragement about the call for proposals, using some of the insights mentioned above and trying to address the intention-action gap with the reminders; and (iii) a checklist to help interested individuals complete the application process and close the intention-action gap.

We can interpret the differences in outcomes between T1 versus T0 localities as the added effect of simplification and expanded communication channels (e.g. local meetings, helpline, etc.), and T2

³ It is important to highlight that, as detailed in the sampling section, the call for proposals and World Bank program were promoted and implemented in many localities across five Mexican states; however, because of budgetary reasons, we restricted our sample to two of the five states: Yucatán and Oaxaca. Moreover, we only ran the RCT and collected data in a subset of the available localities in these states (116, of which only 36 were part of T0).

⁴ Inefficient or unnecessary steps that might delay or prevent people from performing an intended behavior.

⁵ For a summary of these behavioral insights and how they impact these behaviors, see World Bank (2018), Closing the Gender Gap in Natural Resource Management Programs in Mexico.

versus T1 localities as the added effect of including messages based on behavioral sciences principles, reminders and encouragement through proactive text messaging, and the checklist. The differences between T2 versus T0 can be interpreted as the effects of all additions combined. While our main outcome is the average number of applications submitted per locality and the average number of women per locality in those applications, which would suggest manifested interest in participating in NRM programs, we also explored how many were successful in getting their programs funded (actual participation).

The standard outreach was implemented by the agency in charge of the World Bank project and call for proposals, while the additional activities of T1 and T2 were implemented by a local research center.⁶

2.3 Data sources

First, we used administrative data from the Instituto Nacional de Estadística, Geografía e Informática (INEGI) and the National Forestry Commission (CONAFOR) to extract the socio-demographic variables of localities (randomization unit and level of outcome variables). This data is primarily from the latest Population and Household Census of 2010, INEGI Land Use and Vegetation Series VI 2016, National Population Commission (CONAPO) marginalization index by locality 2010, and a private dataset of cell phone and internet coverage provided by the local research center. Outcome data was primarily extracted from the application forms received by the implementation agency of the call for proposals and aggregated at the locality level. Finally, we performed a representative survey of women living in the RCT localities to gather individual-level data of intermediate output indicators (see Section 4.2).

2.4 Sampling

The call for proposals for the World Bank project was promoted and implemented in many localities across five Mexican states; however, because of budgetary reasons, we restricted our sample to two of the five states: Yucatán and Oaxaca. Moreover, we only ran the RCT and collected data in a subset of the available localities in these states, choosing a sample of 113 localities⁷ with characteristics relevant to the project and evaluation, such as the presence of forests. Nevertheless, this was not a representative sample of Mexican rural localities or of those that ultimately applied to this call for proposals (see application-level analysis).

From the 25,631 localities in the official catalog for these two states, 12,880 had locality-level socio-demographic data available in the census dataset.⁸ We applied the filters outlined in Table 2 to the available information as part of the sampling process, also excluding localities without information

⁶ National Laboratory of Public Policy at Centro de Investigación y Docencia Económicas (CIDE).

⁷ Localities are the smallest census units in Mexico. They vary widely in size and demographic characteristics. In the sample, the smallest localities had an adult population of 16 and the largest, 552, although localities can have many thousands.

⁸ The localities not included in the census have no population or have populations larger than 4,999 inhabitants.

on those variables.⁹ Afterwards, a convenience sample was taken to reach 113 localities, accounting for feasibility considerations of the local implementer.

Table 2. Sampling process and localities remaining in each step.

Sampling step	Oaxaca	Yucatán	Total
Starting point - Official list (INEGI census 2010)	13,936	11,695	25,631
Available locality level data (INEGI census 2010)	10,418	2,462	12,880
In agrarian unit with forest coverage (INEGI Land use and Vegetation 2017)	636	238	874
Without land conflict (INEGI census 2010)	542	178	720
With GSM cellphone coverage (private data)	207	115	322
10 adult women (18+) or more in a locality (INEGI census 2010 – also excludes those without detailed data on women population)	124	39	163
Convenience reduction because of logistical limitations	82	31	113

Prior to this call for proposals, localities in the sample received on average 1.48 (min = 0, max = 22) forest grants from CONAFOR¹⁰ between 2007 and 2017, with 67% of localities not receiving any grants. Even though we do not have access to this indicator for localities outside the sample, this information highlights that localities included in this RCT typically had little experience with grant or government program application processes.

2.5 Randomization and balance

Randomization was completed in multiple steps. First, a k-mean algorithm was implemented to create 10 groups of similar localities based on four characteristics: i) proportion of females aged three years or older who spoke an indigenous language in 2010; ii) marginalization index by locality in 2010; iii) number of CONAFOR grants for forest activities received by the locality between 2007 and 2017; and iv) proportion of adult women in the total adult population of the locality in 2010. Second, one-third of each group was randomly assigned to each of the three experimental groups, ensuring a more balanced sample. Prior CONAFOR grants help account for existing forest management capacity, the marginalized locality index (CONAPO, 2010) accounts for socio-economic level, the adult population for the number of potential applicants, and the proportion of adult women and indigenous language speakers account for prioritized groups for this call for proposals.

Finally, localities that were part of an agrarian unit (see footnote 1 for definitions) and that were assigned different experimental groups were re-randomized as a cluster to the same experimental group. The 113 localities were clustered in 84 agrarian units. Most components of the intervention were implemented at the locality level, but some aspects utilized the infrastructure of the agrarian unit, including rooms to have the informational meetings or to hang posters. The re-randomization

⁹ For example, localities that are not part of an agrarian unit are dropped when looking for forest coverage. Also, localities without data for the number of women are dropped when looking for more than 10 adult women. (The census does not include subgroup information of the population for small localities with one or two houses.)

¹⁰ It should be noted that the call for proposals that this RCT leverages is not part of CONAFOR. However, CONAFOR grants are similar in objective and were the best past data available.

at the cluster level prevented contamination of these cluster-level intervention components between experimental groups. The outcome of this randomization is shown in Table 3 disaggregated by state.

Table 3. Localities and agrarian units by experimental group and state

State	Localities				Agrarian Units			
	T0	T1	T2	Total	T0	T1	T2	Total
Oaxaca	27	28	27	82	16	16	24	56
Yucatán	9	9	13	31	8	9	11	28
Total	36	37	40	113	24	25	35	84

With this design, the power calculations indicated that the minimum detectable effect of the RCT was a 32 percentage point difference in number of applications with a power of 0.80 and alpha of 0.05. It should be noted that power might be too low to statistically detect feasibly small differences between treatment arms, especially between T1 and T2.

Table 4 shows the balance test for five variables at the locality level. The p-values were computed from the F-statistics of independent Ordinary Least Square (OLS) models that used each selected variable as dependent variables and the treatments as independent variables. Robust standard errors were clustered by agrarian unit. All p-values are higher than 0.5, which shows they are not significantly different. However, as some differences between groups might be considered economically important, we control for these variables in our models.

Table 4. Balance test at locality level

Variable	T0	T1	T2	p-value
Marginalized Locality Index 2010	0.28	0.37	0.42	0.830
Grants awarded from CONAFOR between 2007-2017	0.97	1.97	1.48	0.548
Proportion of adult women in adult population	51.7%	51.4%	50.5%	0.503
Proportion of women 3 years or older that speak indigenous language	68.4%	53.7%	64.8%	0.551
Adult Population	88.28	97.14	92.20	0.904

Note: Values are product of independent OLS regressions with each variable as dependent variable and treatment as independent variable, clustering robust standard errors by agrarian unit. Descriptive statistics are predicted values and p-values are from the model's F-statistic.

Additionally, we ran independent omnibus tests for each comparison (i.e., T0 versus T1, T1 versus T2, T0 versus T2) in which the treatment variable was the dependent variable of a logistic regression, and the five variables, plus state entity, were independent variables. These logistic regressions also clustered robust standard errors by agrarian unit to account for the randomization. All three models had Wald χ^2 p-values > 0.79 and all independent variables in the model had p-values > 0.196, meaning they are statistically jointly equivalent. Tables of these omnibus tests are available in the online appendix.

2.6 Survey

We conducted a survey to gather representative individual-level data from women in the study area. The survey took place in a subsample of the 113 localities. The survey covered 52 localities of Oaxaca and Yucatán, where data were gathered from 1,485 women between 18 and 45 years old. This sample was constructed using a probabilistic systematic stratified sampling method (with the strata being the state and experimental group), with a margin of error of +/- 2.9% and a confidence level of 95%.

The instrument included questions related to knowledge and awareness of the call for proposals of the WB project and recognition of posters used for the call for proposal. Given the survey was conducted in the middle of the RCT in February 2019, variables that come from this survey should not be considered as outcome variables but as measures of intermediate outputs.

We performed an additional balance test between experimental groups with the survey individual-level sample. Details of it can be found in the appendix. Importantly, the sample of T1 versus T0 was significantly unbalanced (Wald $\chi^2(8) = 23.56$, p-value = 0.0027), mainly driven by “has children” and “speaks indigenous language”. The other omnibus tests were not statistically significant (p-value > 0.288). These variables were used as covariates in the main models to control for this potential unbalance. Still, results from these individual-level regressions should be interpreted with caution given the potential unbalance.

2.7 Analytical approach

The main outcomes of our RCT were captured at the locality level. They include the number of applications sent by locality (either by men or women), the number of women by locality that participated in these applications, the number of applications led by women by locality, and the number of applications by locality whose teams are all women. Secondary outcomes of relevance are the number of applications selected for grants by locality and the total number of people by locality that are part of an application. For these outcomes, we used OLS regressions with treatment status of the locality, controlling for the total adult population in the locality in 2010, the proportion of adult woman in the locality in 2010, the proportion of females three years or older speaking an indigenous language in 2010, the localities' continuous marginalization index in 2010, the number of grants awarded from CONAFOR between 2007 and 2017, and a dummy variable for state entity. We clustered the standard errors by agrarian unit to account for the randomization.¹¹

The main estimates of interest were the coefficients for the treatment variable, particularly the difference between T0 versus T1 and T1 versus T2 to capture the additional effects of the componentes that were added in each group. We also looked at T0 versus T2 given the limitations we have on power, capturing the full package of additions to the standard outreach strategy. These represent Intention-to-Treat (ITT) estimates.

Additionally, the survey data provided us with individual-level outputs, namely whether women had heard about the WB project and call for proposals, and whether they recognized any of the

¹¹ The conclusions do not change if we analyze them without clustering.

posters for each particular experimental group. For the binary (dummy) individual-level outcomes we used logistic regressions with treatment status of the locality in which the individual lived, controlling for age and dummy variables for women married or in a partnership, completed primary education or less, whether they have children, whether they speak an indigenous language, and the state they live in. Rather than clustering by agrarian unit like in the previous regression, for these regressions we clustered standard errors by locality to account for the probabilistic sampling method of the survey.

Additionally, we performed descriptive analyses of the characteristics of individual applications coming from all localities in Yucatan and Oaxaca (rather than only our RCT localities) to explore hypotheses regarding the success and quality of applications from our RCT.

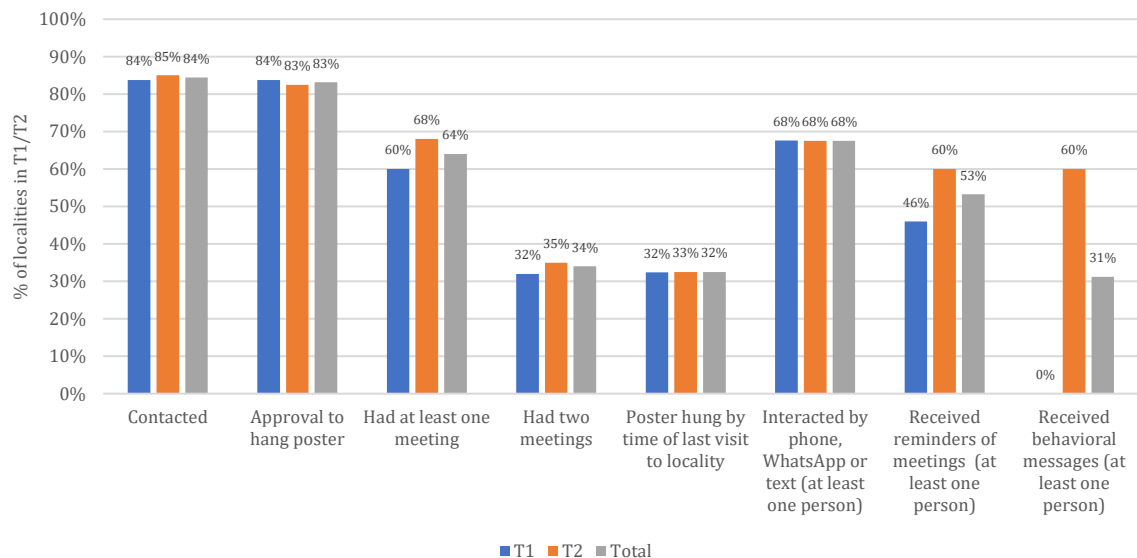
3. Implementation intensity

This section is intended to provide evidence of the different intensities of activities performed in the localities.

According to records from the implementing agency of the standard outreach strategy, there were 17 official meetings in the two states our RCT took place in, involving 256 participants from 198 different localities. At least one person from 30 localities in our RCT attended these meetings (12 localities from T0 [33%], 9 from T1 [24%], and 9 from T2 [23%]). Meeting attendees received the 'standard' (T0) flyers and posters related to the call for proposals to be shared in their communities. We do not have data to assess how many people learned about the call for proposals through other standard channels (e.g., radio, websites, word-of-mouth, etc.).

Additional data was collected by the local research center for the T1 and T2 activities and is presented in Graph 1. Approximately 84.4% of the selected localities in T1 and T2 were contacted by the local allies, with no significant difference between the two treatment groups. Almost all agreed to receive materials and hang them in public spaces, although only 32% kept them hung by the last time the local ally visited the locality. Not all these localities received the two additional meetings designed for T1 and T2: 64% of localities conducted at least one meeting, and only 34% conducted both (with slightly higher percentage of meetings in T2). In both experimental groups, 68% of the localities had at least one person who interacted with the RCT helpline, and 60% of T2 localities had at least one person who received proactive messages informed by behavioral sciences via WhatsApp or text message. Around 55% of people who interacted with the RCT helpline were female, with a slightly higher percentage in T2 (57%). About 49% more people interacted with the helpline in T2 than T1. Regardless of the intensity of the interventions in each locality, all selected localities were included in the analysis, performing ITT estimates.

Graph 1. Percentage of localities with implemented activities in T1 and T2



4. Results

4.1 Main experimental outcomes

Table 5 shows the estimates of T1 and T2 as compared to T0 for different outcome variables, and Table 6 shows additional estimates of T1 versus T2 for the same outcomes.

Table 5. Treatment effects of locality level variables, as compared to T0.

	Applications	Female leader	All-women group	Selected	Total people	Total women
T1	2.308 (0.667)*** [0.001]	1.113 (0.422)*** [0.010]	0.124 (0.106) [0.247]	-0.002 (0.007) [0.765]	7.110 (2.945)** [0.018]	3.508 (1.676)** [0.039]
T2	2.792 (0.748)*** [0.000]	1.889 (0.588)*** [0.002]	0.556 (0.197)*** [0.006]	0.023 (0.023) [0.320]	15.578 (4.954)*** [0.002]	9.889 (3.115)*** [0.002]
Adj Base Mean	.159	.0821	.001	.001	1.671	.740
N	113	113	113	113	113	113
Specification	OLS	OLS	OLS	OLS	OLS	OLS
Base	T0	T0	T0	T0	T0	T0

* p<0.1; ** p<0.05; *** p<0.01. P-values in squared brackets. Robust standard errors clustered by agrarian unit in parenthesis. Covariates include: adult population in the locality, the proportion of adult woman in the locality, the proportion of woman of 3 years or older speaking an indigenous language, the localities' marginalization index of 2010, the number of grants awarded from CONAFOR between 2007-2017, and a dummy of state.

On average, localities in T1 and T2 submitted 2.3 and 2.8 more applications, respectively, than localities in T0. While T2 had a higher average number of applications submitted than T1, the difference was not statistically significant. Given the adjusted base mean of T0 was 0.159 applications (only one application was submitted from the 36 T0 localities, compared to 214 applications among localities in T1 or T2), this increase is quite substantial in relative terms. It represents a 1,452% increase in application rates for T1 localities and a 1,756% increase for T2 in comparison to the control group T0.

The single application in the control group had a team of 22 people, of which half were women, and with a male team leader. Given the strong change in the number of applications between T0 and the other groups, it is not surprising that the average values of these indicators related to the teams also show a large change. While comparisons between T0 and the other groups are still valid because we compare the *average* number per locality, we should note that the comparisons between T1 and T2 for these indicators may be more meaningful given the variety of applications and teams. In terms of number of applications that had a female leader, on average, there was a 1.113 and 1.889 increase for T1 and T2, respectively, as compared to T0. There was again no significant difference between T1 and T2. In terms of applications that had an all women group, T1 did not have a statistically significant effect compared to T0. T2, however, showed an increase of 0.433 applications compared to T1.

Even though the objective of the outreach strategy and the RCT was specifically to increase the number of applications submitted, especially by women, we also looked into the applications that ultimately were selected to receive a grant. As shown in Table 6, the increase in the average number of applications did not translate into a higher average number of applications per locality that were ultimately selected to receive grants. Actually, only one application from T2 was selected. Additional information about this individual analysis may be found in section 4.3.

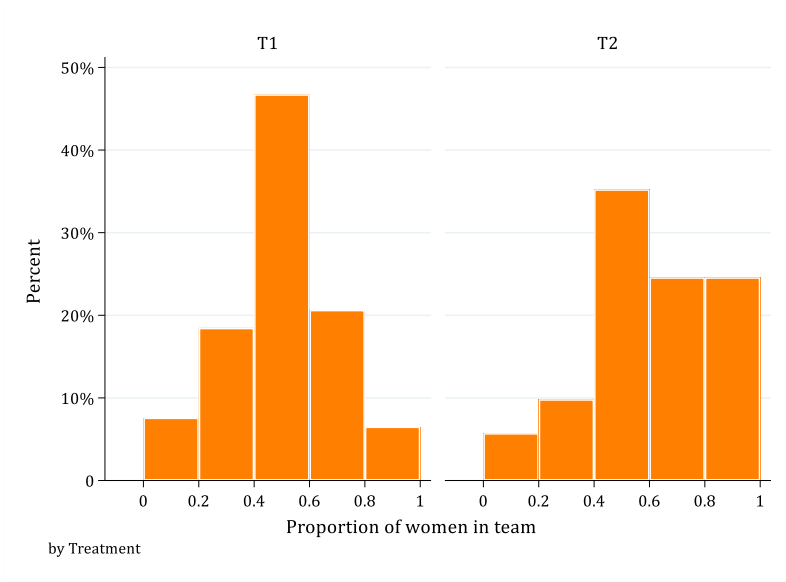
Table 6. Treatment effects of locality level variables, as compared to T1.

	Applications	Female leader	All-women group	Selected	Total people	Total women
T0	-2.308 (0.667)*** [0.001]	-1.113 (0.422)*** [0.010]	-0.124 (0.106) [0.247]	0.002 (0.007) [0.765]	-7.110 (2.945)** [0.018]	-3.508 (1.676)** [0.039]
T2	0.485 (0.910) [0.596]	0.776 (0.606) [0.204]	0.433 (0.190)** [0.025]	0.025 (0.025) [0.323]	8.469 (5.154) [0.104]	6.381 (3.186)** [0.048]
Adj Base Mean	2.466	1.195	.125		8.781	4.248
N	113	113	113	113	113	113
Specification	OLS	OLS	OLS	OLS	OLS	OLS
Base	T1	T1	T1	T1	T1	T1

*p<0.1; ** p<0.05; *** p<0.01. P-values in squared brackets. Robust standard errors clustered by agrarian unit in parenthesis. Covariates include: adult population in the locality, the proportion of adult woman in the locality, the proportion of a woman of 3 years or older speaking an indigenous language, the localities' marginalization index of 2010, the number of grants awarded from CONAFOR between 2007-2017, and a dummy of state.

As applications were submitted as a group, the study analyzed the total number of people that were part of the applications. This statistic was disaggregated by gender. As for previous indicators, on average, there was a significant increase in terms of total people and, specifically, the number of women that applied in both T1 and T2 localities (compared to T0). Both indicators were higher in T2 than T1. Although "total people" only barely missed the 10% significance threshold (p-value = 0.104), "total women" was significant at the 5% confidence level. As partially captured in the indicator of "All-women group", the proportion of women in teams from T2 was higher than in T1, with the distribution of T2 skewed to the right (see Graph 2).

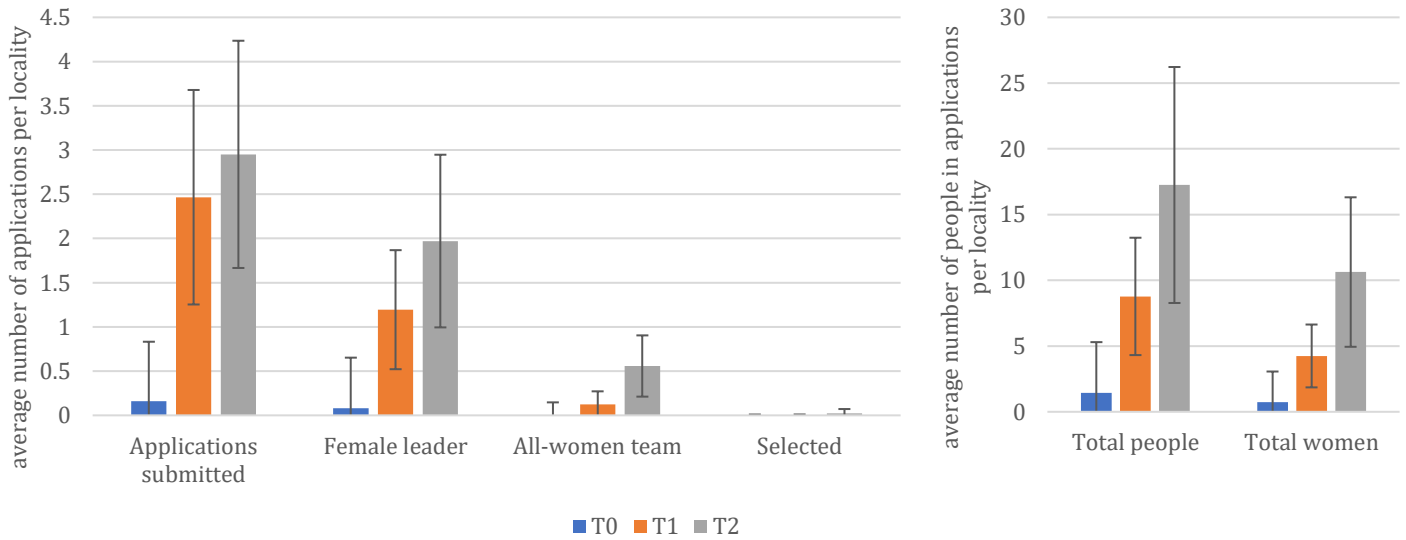
Graph 2. Proportion of women in teams of submitted applications. by treatment.



Note: T0's only application had an even split between women and men

For ease of interpretation, Graph 3 shows bar graphs of the marginal estimates of the main indicators in the above models by experimental group.

Graph 3. Main indicators by experimental groups.



Notes: Whiskers represent 95 Confidence Intervals. Marginal estimates from main OLS regressions with covariates.

The tables in the appendix show the regressions without controls, where robust standard errors were still clustered by agrarian unit, and regressions with controls but without clustering. Conclusions from this analysis remain unchanged.

4.2 Individual level outputs

The survey provided intermediate outputs and mechanisms that could help explain the previously reported impacts: whether an individual had heard about the call for proposals and whether they recognized any of the posters for their particular experimental group. The treatment estimates of these outcomes are in Table 7, controlling for covariates, including the one that was unbalanced.

Table 7: Individual-level outputs (survey)

(Models 1, 3, and 5 use T0 as comparison/base group, while 2, 4, and 6 use T1)

	Heard of call (1)	Heard of call (2)	Recognizes posters (3)	Recognizes posters (4)	Recognizes posters or heard of call (5)	Recognizes posters or heard of call (6)
T1	0.047 (0.025)* [0.060]		0.097 (0.045)** [0.032]		0.081 (0.048)* [0.091]	
T2	0.036 (0.023) [0.120]	-0.010 (0.023) [0.650]	0.108 (0.044)** [0.013]	0.011 (0.056) [0.837]	0.084 (0.044)* [0.058]	0.003 (0.057) [0.959]
T0		-0.047 (0.025)* [0.060]		-0.097 (0.045)** [0.032]		-0.081 (0.048)* [0.091]
Adj Base Mean	0.050	0.097	0.111	0.207	0.152	0.233
N	1,480	1,480	1,483	1,483	1,483	1,483
Specification Base	Logit T0	Logit T1	Logit T0	Logit T1	Logit T0	Logit T1

* p<0.1; ** p<0.05; *** p<0.01. P-values in squared brackets. Robust standard errors clustered by localities in parenthesis. Coefficients of logits are marginal effects. Covariates include: age and dummy variables for women married or in a partnership, complete primary education or less, whether they have children, whether they talk an indigenous language, and state entity.

Approximately 5% (adjusted) of women in T0 had heard about the call for proposal for the World Bank project, compared with 9.7% in T1 and 8.6% in T2. This means survey respondents who live in a locality where T1 was implemented were 4.7 percentage point (pp) more likely to have heard of the call for proposals. Additionally, 11.1% of surveyed women in T0 recognized at least one of the posters related to the call for proposals. Women in T1 and T2 were more likely to recognize posters compared to women in T0 by 9.7pp and 10.88pp, respectively. Taken together, approximately 15.2% of women in T0 had heard about the call for proposals *or* recognized at least one poster. Models 5 and 6 in Table 7 were run with this combined outcome variable. Compared to T0, T1 and T2 saw a respective 8.1 pp and 8.4 pp increase in women that had either heard of the call for proposals or recognized at least one poster, significant at the 10% confidence level.

4.3 Exploratory analysis of applications

Although the objective of the outreach strategy was specifically to increase the number of applications submitted, we wanted to better understand the reasons behind the low success of applications in getting selected for funding. Hence, we performed an exploratory analysis of all applications received by the call for proposals for this program in Oaxaca and Yucatán, even outside the RCT sample localities. The analysis below will focus specifically on comparing applications from our RCT sample with those submitted from other localities. There are two important issues to highlight. First, that this analysis is exploratory rather than causal, as we did not have an experimental variation or comparable groups for this analysis. Second, that we are comparing

groups of localities and populations with different characteristics, since our experimental sample was selected through a series of filters and not a random sampling of eligible localities. In this exploratory analysis, we analyze each specific application, rather than the aggregated number of applications in each locality (i.e., the unit is the application, rather than the locality). Given T0 only had one application (which was not selected for a grant), comparing the characteristics of this unique application to average characteristics of applications from T1 and T2 (which had 214 applications) could be too noisy and not meaningful. While we cannot derive conclusive evidence from this exploratory analysis, it can help generate hypotheses as to why the experimental sample had a low number of applications that were selected for funding.

Only one application that was submitted to this call for proposals from localities in the RCT sample was selected for grants (0.4% - this application came from T2). While localities outside the RCT sample submitted a similar total number of applications (215 in the sample and 226 outside), the rate of applications selected was much higher outside the sample (11% - 26 applications from outside the RCT sample). Furthermore, administrative data shows that 93% of the applications submitted from the RCT sample lacked important details, while only 48% of applications from outside our localities had this characteristic. Unfortunately, we do not have more detailed data to assess and compare the “quality” of the proposals or to isolate the specific issue that caused the difference in success rate, although we include some hypotheses below. Also, the average number of applications per in-RCT-sample locality was much higher (mean from inside sample = 6.52, mean from outside sample = 1.39, $t = -10.81$, $df = 179$, $p\text{-value} < 0.001$), with 76% of localities that submitted an application from outside the sample submitting only one application. Furthermore, when comparing the demographic characteristics of these localities, the localities from the RCT sample that sent applications are smaller on average, have a larger proportion of the population that speaks indigenous languages, have fewer years of schooling, and have a slightly smaller proportion of women and adults in the population (this difference is the result of the selection criteria of the localities used for the RCT). Finally, applications outside the RCT sample were typically projects involving larger land areas and team sizes, and including a broad set of timber and nontimber activities in forest landscapes, possibly showing more diversity of activities.

5. Discussion, conclusions, and policy implications

The strategies used to complement the standard outreach strategy through simplification and expanding the communication channels were effective in achieving the objective of increasing the number of applications sent by localities, including applications that included women. While the control group localities barely submitted applications (one application received from all 36 localities), the treatment groups sent, on average, more than 2.4 applications per locality. Complementing this with insights from behavioral sciences, a checklist, and proactive reminders and encouraging messages had an additional effect on the share of women taking part in these applications. However, this increased number of applications did not translate into more grants being awarded to these localities.

The evidence shows that the largest effect on the number of applications can be attributed to expanded communication channels and simplification process (T1). While the localities that received the content that leveraged behavioral sciences insights and provided proactive reminders

and checklist (T2) had a higher average number of applications compared to T1, this difference was not statistically significant. Unsurprisingly, this strong increase in number of applications translated into many more applicants, including women. Treatment localities had between 7 and 15 more people per locality applying, and between 4 and 10 more women. A survey in these localities also shows that, at the individual level, there was a higher knowledge of the call for proposals or recognition of posters by women in T1 and T2 compared with women that only received the standard outreach strategy.

The intervention in T1 localities tested a set of additions in outreach, such as expanding the communication channels—personal outreach to each locality, setting up two meetings in their localities to explain the call for proposals and process, and the creation of a helpline. While the standard outreach method reaches out to communities through meetings as well, localities that are less accustomed to responding to calls for proposals (as our sample appeared to be) may be less motivated to go out to obtain the necessary information, especially if it involves commuting to a different locality. Additionally, T1 included a simplification process for information. Having easy to understand materials may be especially important in contexts of lower educational levels, language barriers, and lower economic outcomes, as our sample showed. These strategies help prevent “friction costs,” that is, the seemingly small but detrimental barriers that keep individuals from engaging with a service, and which reduce the cognitive bandwidth required to grasp the information. Finally, another aspect included is the support of local allies, which was expected to improve trust issues between localities and outsiders. Among the limitations of our intervention, we faced budget and operational restrictions that did not allow for having multiple treatment arms for each independent activity in the package for T1 or T2. Therefore, the impact of each individual activity cannot be decoupled from the group of activities performed under each treatment group. Nevertheless, the package of interventions from T1 was designed to make it easier for individuals to learn about and apply to the program, and so we generally believe this is the reason for the increase.

Morover, the additions of T2, such as messages informed by behavioral insights, had an independent, positive, and statistically significant effect on the number of women applying, complementing the effect of the expanded channels and simplification process. In particular, T2 seems to have increased the proportion of female team members and the number of applications with teams composed fully of women. T2 intended to address social norms and barriers that could prevent women from applying to NRM programs and projects, by mentioning women directly and suggesting others are participating, compared to T1, where messaging lacked components that specifically targeted women. Reminders, checklists, and use of loss aversion principles were additional components of T2, which we hypothesized would have increased the number of applications overall. While there was a higher average number of applications in T2 compared to T1, the differences were not statistically significant. It may be that the study lacked the power to detect statistical significance or that, following the simplification and more intense outreach of T1, the additional strategies employed were more effective at making teams feel comfortable with being composed of mostly women, rather than at encouraging additional teams or applications.

Even if the additional components of T2 increased the share of women applying when compared to T1, counter to initial expectations, they did not appear to increase awareness or recognition of

materials of the call for proposals by women (captured in the survey), beyond the increase that T1 components had already achieved. This may be because the groups in the survey seemed slightly different before the intervention started (unbalanced) or that the informational barrier was already overcome with the adaptations made through T1. Future research could include analyzing the specific effects of each individual treatment activity, rather than assessing the intervention as a package of activities, which would allow for better understanding of the impact of each individual insight and strategy.

While the main objective of the RCT was achieved by motivating more people, especially women, to apply to productive NRM projects, there was no evidence that these interventions were enough to achieve the required quality for applications to be selected to receive funding. While we could not assess the technical quality of applications, exploratory analysis of the available data suggests these might have been missing information at a higher rate than applications from outside the RCT sample. We unfortunately do not have enough data to isolate why this was the case, but we can formulate a few hypotheses. First, the filters used to select localities for this RCT broadly achieved the objective of reaching relevant localities that are typically not actively involved in forest management programs and projects, possibly reaching localities with less capacity as well. As a consequence, the RCT sample ended up being less representative of typical participants, where results may not be directly transferable to all localities that the World Bank project serves. For example, these localities had lower educational level, more people speaking indigenous languages, and inexperience with this type of program. While the project had planned to provide technical assistance to teams in phase two of proposal development (and our study focused only on phase one), it appears that such assistance might be needed earlier to support some communities to complete successful entry point applications. Second, a possible unintended consequence of the intervention, in particular of the additional and simplified communications, while successful at encouraging applications, may have lacked the technical detail required to support *successful* applications that were selected, particularly in view of the likely low baseline capacity in these localities. In this sense, it is possible that by trying to reach more individuals directly and simplify the process and prompts, the ideation of projects may have lacked a more participatory and meticulous process. This *does not* mean the interventions negatively impacted the number of successful applications of these localities, since the control group (counterfactual) suggests no or very few applications would have been sent at all absent of the study.

This paper provides important lessons for the development of community driven development investments and projects. While active participation of women in NRM programs and projects in Mexico is relatively low compared to men, this study demonstrated that rural women are interested in participating in such programs. We show that the outreach of these programs would be more effective if it explicitly targets rural women through accessible channels and relatable messaging. However, the study also demonstrated that applicants may require technical assistance to identify and formulate project ideas, especially in the very early stages, and to provide them with the knowledge and tools necessary for a meaningful engagement in calls for proposals. Furthermore, while simplification may be important for people to take the action of applying, it is important to keep in mind a balance that does not detriment quality. By taking a human-centered approach to understand barriers that women or marginalized groups face in the takeup and sustainability of

NRM programs and projects, it is possible to support gender inclusion by making the communications and outreach strategy fit better the needs and motivations of these groups.

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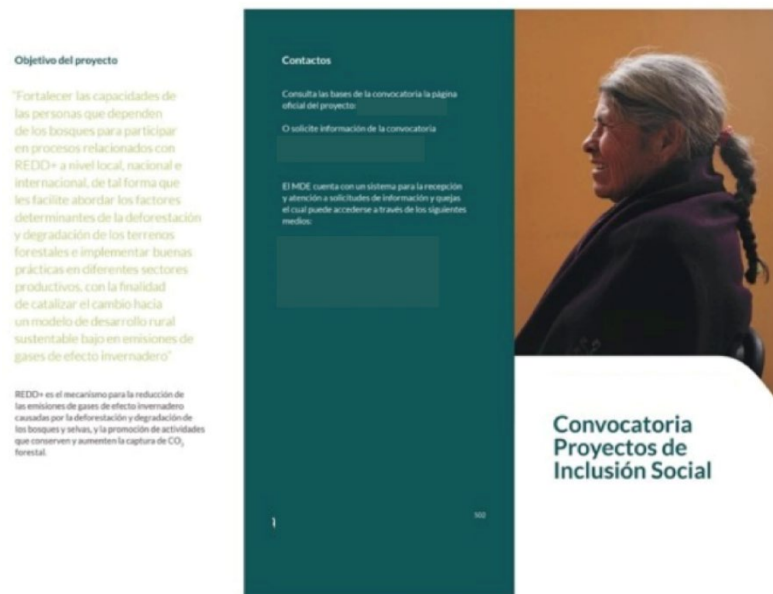
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1. Appendices


1.1 Materials¹

Figure 1. Poster T0



¹ Materials have been slightly redacted

Figure 2. Brochure T0



COMPONENTES DE LA CONVOCATORIA:

- Proyectos de inclusión financiera orientada a mercados
- Proyectos de inclusión social
- Formación y capacitación de promotoras y promotores comunitarios locales
- Intercambios de conocimientos

CONVOCATORIA FINANCIAMIENTO

DE PROYECTOS PRODUCTIVOS Y ACTIVIDADES PARA EL DESARROLLO DE CAPACIDADES PARA PUEBLOS INDIGENAS Y COMUNIDADES LOCALES

Campeche, Jalisco, Oaxaca, Quintana Roo y Yucatán a participar en el proceso de selección para el otorgamiento de financiamiento de proyectos productivos y actividades para el desarrollo de capacidades para evitar la deforestación y degradación de bosques y selvas y promover procesos productivos que reduzcan emisiones de gases de efecto invernadero.

Cierre de la convocatoria ventana de inclusión financiera: 28/SEP/18
Cierre de la convocatoria ventana de inclusión social: 31/MZO/19

PARA MÁS INFORMACIÓN SOBRE LA CONVOCATORIA

INGRED convoca a interesados en participar en el proceso de selección para el otorgamiento de financiamiento de proyectos productivos bajos en carbono para grupos de trabajo sin derechos agrarios reconocidos.

Convocatoria dirigida a:

- Grupos de trabajo sin derechos agrarios reconocidos
- Grupos de mujeres
- Grupos de jóvenes
- Autocuidado y autoestima

En esta ventana no podrán participar nichos agrarios.



Fase 2: Propuesta técnica de proyecto

Los seleccionados de la fase 1 deberán presentar la propuesta técnica del proyecto para su evaluación. Recuerda que durante este proceso contarás con apoyo técnico para desarrollar los elementos de la propuesta completa.

Fecha máxima de entrega de propuestas de proyectos: 04 de octubre de 2019.

Estados elegibles:

Los Grupos de trabajo sin derechos agrarios reconocidos de los estados de Jalisco, Campeche, Quintana Roo, Oaxaca y Yucatán. Pertenecientes en áreas prioritarias por sus procesos de deforestación, degradación o por ser considerables áreas de importancia por su nivel de conservación.

Tipo de actividades elegibles:

Entre las actividades que podrán ser financiadas, sin ser limitativas, se encuentran las relacionadas con:

- Manejo Forestal Sustentable
- Agricultura climáticamente inteligente
- Sistemas agroforestales
- Sistemas silvopastorales
- Ecoturismo
- Promoción e inclusión de la gobernanza local
- Vinculación comunitaria

Fecha de máxima de entrega de propuestas de proyectos: 31 de marzo de 2019

Figure 3: Posters for T1 localities



Figure 4: Posters for T2 localities

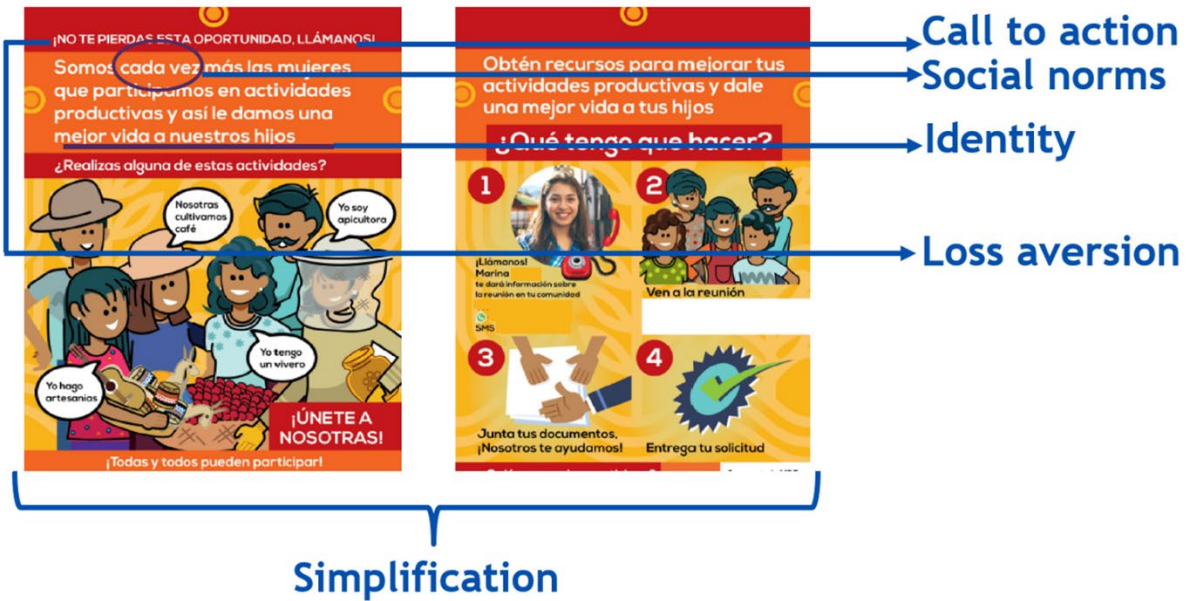


Figure 5. Checklist received by attendees of the T2 information meeting

¡NO TE PIERDAS ESTA OPORTUNIDAD!
¡Participa y dale una mejor vida a tus hijos!

Gracias por tu interés. Sé parte de este grupo que, como tú, buscan darle una mejor vida a sus familias.
 La fecha límite para solicitar los recursos es el 29 de marzo de 2019.
 ¡Nosotros te acompañamos a completar estos sencillos pasos! Palmea cada paso cuando lo completes y cuéntanos cómo vas.

¡Arrancamos!

Completo	Lista de actividades	Diciembre				Enero				Febrero			
		1	2	3	4	1	2	3	4	1	2	3	4
<input checked="" type="checkbox"/>	Asiste a la reunión en tu comunidad o pide información a las autoridades. Obtén los formatos para llenar (formato carta poder y de solicitud para aplicar el												
2	Llámanos para obtener más información y resolver cualquier duda. Llama <input checked="" type="checkbox"/>												
3	Forma tu grupo de diez a veis personas y completa la lista de integrantes. (Recuerda que pueden ser miembros de tu familia)												
4	Elige a un representante y busca su identificación oficial (credencial para votar INE, credencial INAPAM, cédula profesional...) y su CURP. Si no tienes el CURP, nosotros te ayudamos												
5	Con tu grupo, desarrolla la idea de tu proyecto. (Escríbelo! Recuerda que puedes llamarnos para platicar tus ideas y resolver dudas)												
6	Comiencen a llenar el formato de solicitud. (Recuerda que puedes llamarnos para que te apoyemos! Llena la sección A y B)												
7	Ahora, lleva las secciones C y D del formato. (Puedes llamarnos para que te apoyemos! ¡Ya casi lo logras!												
8	Completan y firman la carta poder con datos de los miembros de tu equipo y representante. Necesitas una copia de identificación de todos los integrantes												
9	Prepárate para la reunión. Necesitas: lista de integrantes, CURP e identificación del representante, formato <input checked="" type="checkbox"/> y carta poder firmada con copias de identificaciones												
10	Asiste a la reunión a revisar y firmar tu solicitud. (No olvides los documentos que ya preparaste! (Estas listo para solicitar los fondos del												

¡Lo lograste!

Muchas felicitaciones por el esfuerzo. Los resultados del salen en mayo 2019.
 Recuerda que este esfuerzo es para darle una mejor vida a tus hijos. (Sigue al pendiente!

1.2 Text/WhatsApp Messages

MESSAGE	DATE
Welcome! Thank you for your interest in the [program]. Don't miss out on this opportunity! Call [phone]/WhatsApp [phone].	After each of the first meetings
Remember that the [program] will provide resources for your productive activities in order to give a better life to your family. Don't miss out on this opportunity! Call [phone]/WhatsApp [phone].	After each of the first meetings
Thank you for contacting us! You can find us at our working hours: Mon-Fri 9-17 hrs. [phone]/WhatsApp [phone].	Out of office message
Hi [name], thanks for your interest. Enjoy the holidays and remember that there is an opportunity waiting for you! Join the [program] and give your family a better quality of living. See you in January!	December 22
Happy new year! Remember that the [program] helps you with resources for your productive activities in order to give your children a better life. Call us beginning on January 7: [phone]/WhatsApp [phone].	January 2
Remember that the [program] will provide resources for you to work and give a better life to your family. Contact us beginning at January 7! [phone].	January 4
If your new year's resolution is to give you family a better life, the [program] can help you accomplish it. Call us and participate! [phone].	January 4
The telephone line of the [program] is [phone]/WhatsApp [phone]. We are waiting for you!	January 4
We are back! Let's start your journey in the [program] together. Don't miss out on this opportunity! It's only 10 steps! Use the orange sheet that they gave you at the meeting as a guide. We'll start with the third step of the orange sheet. Give us a call us if you don't have it!	January 7
Hi, you can communicate with us at these numbers: [phone]/WhatsApp [phone]. We are waiting for you!	January 7
Step 3: Have an idea and form a team of 2 or more people for the [program]. Fill the list of participants. They can be from your family and benefit together! Don't miss out on this opportunity!	January 8
Step 4: Choose your representative. In order to participate you will need a copy of their official ID and CURP. If you don't have your CURP, we can help you out.	January 9
Have you formed your team of 2 or more people for the [program]? Make a list and search for a copy of the ID and CURP of your representative. Tell us if you got it!	January 11
Step 5: Develop your idea alongside your team. Write it out! Remember that you can call us with your ideas and solve any questions.	January 14
How is the development of your idea going? You can call us for support and for any inquiry: [phone]/WhatsApp [phone].	January 16
Step 6: Fill your [program] format! More people like you are already doing it. Start with sections A and B. Give us a call! We'll help you out.	January 18
We recommend you contact us on the phone or WhatsApp to help you better with the format. Call us! [phone]/WhatsApp [phone].	January 18
Most of the people interested are filling sections A and B of their format. Remember that we can help you, call us at [phone]/WhatsApp [phone].	January 21
Today, almost everyone has already filled sections A and B of their format. How are you doing? Call us if you need help!	January 23
Step 7: Now fill sections C and D of your [program] format! Don't miss on the opportunity to participate! Call us, we'll help you out!	January 25
Most of the interested people are filling sections C and D of their format. Remember that we can help you, call us at [phone]/WhatsApp [phone].	January 28
Remember that the [program] will provide resources for your productive activities. Don't miss out the chance to participate and give your family a better life!	January 28
Do you have your full [program] format? You are still in time and you have made great progress. If you have any questions, we will help you!	January 30
We have worked really well together. In order to take the next step, send us a photo of your format to confirm that it is filled. Thank you very much!	February 1

Step 8: Complete and sign the power of attorney with the data of the members of the team. You will need a copy of the ID of all the members.	February 5
Remember that you can call us via phone or WhatsApp if you need help with the power of attorney. Call us! [phone]/WhatsApp [phone].	February 5
Step 9: Prepare for the meeting. You will need: list of members, CURP and ID of the representative, the [program] format and the power of attorney with a copy of all of the member's ID	February 6
The finish line of your [program] application is getting closer! Keep going and call us if you have any questions. Many people like you are doing it. Give us a call!	February 6
Do you have your full [program] format? You are still in time and you have made great progress. If you have any questions, we will help you out!	February 7
Remember that the [program] will provide resources for your productive activities. Don't miss out the chance to participate and give your family a better life!	February 11
The finish line of your [program] application is getting closer! Keep going and have your documents ready. Many people like you are doing it.	February 14
Hi! We will be receiving the formats until tomorrow, so that we can look through them before the meeting. WhatsApp [phone], [email]. Thank you!	February 18
The meeting to pick up the documents for the [program] will be on __ at __ in __	Before each meeting
The documents you will need are: ID, CURP, filled application format, list of participants and the power of attorney.	Before each meeting
We have delivered your [program] application! Congratulations on the effort and the accomplishment of the goal, be aware of the results!	March 29
The [program] results will be out on May 2019. You have achieved the first goal! Remember that this effort is made to give your children a better life.	May 5
Our accompaniment finishes here. If you have any questions, please call the [program implementer] at [phone]. You can also check the webpage [website]	May 5

1.3 Description of Sample and comparison with other localities in States

Table 4 uses 2010 census data to compare all localities in Oaxaca and Yucatán versus the localities sampled for the study. The team also included a comparison with rural localities in the states that have forest coverage. An important caveat of this analysis is that the census does not include subgroup information of the localities' population (e.g., the population of men versus women, population that speaks the local indigenous language) for localities with only one or two houses. This affects 30 percent of the localities of the selected states. In the census data, these localities appear as missing values when subgroup information is used as variables for comparison. Additionally, filtering for localities with more than ten women excluded any locality without this information.

Localities in the sample are, on average, larger in terms of inhabited houses and population than rural localities with forest coverage. This is likely due to the aforementioned exclusion of localities with one or two houses. Those in the sample are also marginally smaller than the states' average size, but not significantly.

In addition, localities in the sample are similar to rural localities with forest coverage – both feature agriculture as the main economic activity and a similar proportion of people above three years of age speaking indigenous languages.² These characteristics are less prominent in the selected states as a whole. The sample is slightly more educated than other rural localities with forest coverage, and marginally lower than the state, although these differences are not statistically significant.

According to available demographic variables, females make up about half of the population in the localities, on average, for all comparison groups. But localities in the sample have fewer women-headed households than the state average, and about the same as rural localities with forest coverage.

Finally, for localities with data on the marginalization index of 2010³, we show descriptive statistics in Table 4 using the official groups “Very High” and “High” based on official cutoffs of the continuous index. Most localities in the sample are marginalized, with 68% in the “High” group and 29% in the “Very High” group. We can also assess the differences between localities using the continuous marginalization index: The sample localities ($M = .36$, $SD = .78$) are, on average, less marginalized than other rural localities with forest coverage ($M = .72$, $SD = .87$); but virtually equally marginalized with those across the state ($M = .33$, $SD = .85$).

² Localities in these two states had, according to the 2010 census, at least 27 indigenous languages spoken. Our sample had at least 10 of these indigenous languages. Rural localities with forest coverage had at least 15. Nevertheless, in terms of proportion of people speaking indigenous languages, the sampled localities had a higher average proportion of people speaking an indigenous language (0.62) than the average locality in these two states (0.45). Rural localities with forest coverage had 0.59, which is statistically equivalent to our sampled localities.

³ CONAPO (2010) Índice de marginalización por localidad 2010. Taken from http://www.conapo.gob.mx/es/CONAPO/Indice_de_Marginacion_por_Localidad_2010

The marginalization index combines a series of socio-economic indicators: percentage of population 15 years or older illiterate or without completing primary education, percentage of inhabited houses without a toilet, electricity, refrigerator or piped water, or with dirt floor, and average number of inhabitants per room.

Table 4. Comparison of study sample vs. rural localities with forest coverage vs. all localities in the states.

	Experimental Sample					Rural Localities with Forest Coverage					All localities in states				
	N	Mean or %	SD	Min	Max	N	Mean or %	SD	Min	Max	N	Mean or %	SD	Min	Max
Total inhabited houses	113	37.96	34.88	5	209	870	20.69	35.69	1	309	12,880	53.73	124.32	1	1296
Total population	113	172.22	173.38	28	1230	870	92.67	163.25	1	1513	12,880	221.46	501.75	1	4939
Agriculture as main economic activity (dichotomic)	112	89.29%				780	91.03%				11,641	78.76%			
With population that speaks indigenous language (dichotomic)	113	76.11%				794	75.94%				11,826	61.19%			
Without information of subgroups in locality (less than 3 households in locality – dichotomic)	113	0.00%				870	30.57%				12,880	31.23%			
Proportion female	113	0.5	0.04	0.39	0.61	604	0.5	0.07	0	0.78	8,857	0.51	0.06	0	1
Proportion of female-headed households	113	0.16	0.12	0	0.5	604	0.15	0.13	0	0.75	8,839	0.20	0.13	0	1
Proportion that speaks indigenous language for 3 years or older	113	0.62	0.41	0	1	604	0.59	0.4	0	1	8,839	0.45	0.41	0	1
Average grades of schooling for 15 years or older	113	4.89	1.31	1.88	10.56	604	4.7	1.43	0	11.47	8,839	5.09	1.67	0	18.23
Marginalization index = Very High (dichotomic)	113	29.20%				604	42.05%				8,839	28.72%			
Marginalization index = High (dichotomic)	113	68.14%				604	56.62%				8,839	65.79%			

1.4 Omnibus balance tests of localities' sample

	T0 vs T1	T0 vs T2	T1 vs T2
Yucatán (dummy)	0.196 (0.767) [0.799]	0.541 (0.730) [0.459]	-0.060 (0.715) [0.933]
Marginalized Locality Index 2010	-1.261 (0.975) [0.196]	-0.886 (0.980) [0.366]	0.793 (1.000) [0.428]
Proportion of women 3 years or older that speak indigenous language	0.408 (0.491) [0.406]	0.459 (0.479) [0.338]	-0.082 (0.413) [0.843]
Grants awarded from CONAFOR between 2007-2017	0.077 (0.105) [0.461]	0.067 (0.090) [0.456]	-0.015 (0.070) [0.829]
Proportion of adult women in adult population	-1.953 (6.780) [0.773]	-6.956 (5.770) [0.228]	-4.068 (5.381) [0.450]
Adult Population	0.004 (0.003) [0.275]	0.001 (0.003) [0.639]	-0.002 (0.003) [0.603]
Constant	1.185 (3.531) [0.737]	3.731 (3.033) [0.219]	1.897 (2.821) [0.501]
Chi2	2.997	3.142	1.649
p-value	0.8092	0.7908	0.9490
Pseudo R2	0.0577	0.0448	0.0235
N	73	76	77
Specification	Logit	Logit	Logit
Base	T0	T0	T1

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. P-values in squared brackets. Robust standard errors clustered by agrarian unit in parenthesis. Coefficients are log odds.

1.5 Main regression tables without covariates

	Applications	Female leader	All-women group	Selected	Total people	Total women
T1	2.459 (0.708)*** [0.001]	1.189 (0.436)*** [0.008]	0.135 (0.051)** [0.010]		8.416 (2.702)*** [0.003]	4.127 (1.310)*** [0.002]
T2	3.022 (0.846)*** [0.001]	2.050 (0.664)*** [0.003]	0.550 (0.209)*** [0.010]		17.164 (5.821)*** [0.004]	10.544 (3.625)*** [0.005]
<i>Adj Base mean</i>	.0278	0	0		.611	.306
<i>N</i>	113	113	113		113	113
<i>Specification</i>	OLS	OLS	OLS		OLS	OLS
<i>Covariates</i>	No	No	No		No	No
<i>Base</i>	T0	T0	T0		T0	T0

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. P-values in squared brackets. Robust standard errors clustered by agrarian unit in parenthesis.

	Applications	Female leader	All-women group	Selected	Total people	Total women
T0	-2.459 (0.708)*** [0.001]	-1.189 (0.436)*** [0.008]	-0.135 (0.051)** [0.010]		-8.416 (2.702)*** [0.003]	-4.127 (1.310)*** [0.002]
T2	0.564 (1.103) [0.611]	0.861 (0.795) [0.282]	0.415 (0.215)* [0.057]		8.748 (6.358) [0.173]	6.418 (3.829)* [0.098]
<i>Adj Base mean</i>	2.486	1.189	.135		9.027	4.432
<i>N</i>	113	113	113		113	113
<i>Specification</i>	OLS	OLS	OLS		OLS	OLS
<i>Covariates</i>	No	No	No		No	No
<i>Base</i>	T1	T1	T1		T1	T1

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. P-values in squared brackets. Robust standard errors clustered by agrarian unit in parenthesis.

1.6 Main regression tables without clustering

	Applications	Female leader	All-women group	Selected	Total people	Total women
T1	2.308 (0.718)*** [0.002]	1.113 (0.403)*** [0.007]	0.124 (0.100) [0.218]	-0.002 (0.006) [0.719]	7.325 (2.844)** [0.011]	3.508 (1.618)** [0.032]
T2	2.792 (0.739)*** [0.000]	1.889 (0.584)*** [0.002]	0.556 (0.200)*** [0.006]	0.023 (0.023) [0.314]	15.798 (5.008)*** [0.002]	9.889 (3.195)*** [0.003]
N	113	113	113	113	113	113
Specification	OLS	OLS	OLS	OLS	OLS	OLS
Base	T0	T0	T0	T0	T0	T0

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. P-values in squared brackets. Robust standard errors in parenthesis. Covariates include: adult population in the locality, the proportion of adult woman in the locality, the proportion of woman of 3 years or older speaking an indigenous language, the localities' marginalization index of 2010, the number of grants awarded from CONAFOR between 2007-2017, and a dummy of state.

	Applications	Female leader	All-women group	Selected	Total people	Total women
T0	-2.308 (0.718)*** [0.002]	-1.113 (0.403)*** [0.007]	-0.124 (0.100) [0.218]	0.002 (0.006) [0.719]	-7.325 (2.844)** [0.011]	-3.508 (1.618)** [0.032]
T2	0.485 (0.976) [0.621]	0.776 (0.624) [0.216]	0.433 (0.195)** [0.028]	0.025 (0.025) [0.315]	8.473 (5.324) [0.115]	6.381 (3.308)* [0.056]
N	113	113	113	113	113	113
Specification	OLS	OLS	OLS	OLS	OLS	OLS
Base	T1	T1	T1	T1	T1	T1

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. P-values in squared brackets. Robust standard errors in parenthesis. Covariates include: adult population in the locality, the proportion of adult woman in the locality, the proportion of woman of 3 years or older speaking an indigenous language, the localities' marginalization index of 2010, the number of grants awarded from CONAFOR between 2007-2017, and a dummy of state.

1.7 Balance of survey sample

Table 1.7.1 shows the balance test for seven variables at the individual level. The p-values are from F-statistics of independent OLS models that used each variable as a dependent variable and each treatment as an independent variable, clustering robust standard errors by locality.

Only “has children” is statistically unbalanced ($F[2, 51] = 7.97$, $p\text{-value} = 0.001$) with T1 having significantly more parents than the other groups. Omnibus tests of the joint significance of each comparison (i.e., T0 vs T1, T0 vs T2, T1 vs. T2) were run using logistic regressions and including a dummy for state entity to account for the sampling design. Only the model of T0 vs. T1 was statistically significant (Wald $\chi^2(8) = 23.56$, $p\text{-value} = 0.0027$), mainly driven by “has children” and “speaks indigenous language”. The other omnibus tests were not statistically significant ($p\text{-value} > 0.288$). These variables were used as covariates in the main models to control for this potential unbalance. The other two omnibus tests were not statistically significant (T0 vs. T2: Wald $\chi^2(8) = 4.66$, $p\text{-value} = 0.7936$; T1 vs. T2: Wald $\chi^2(8) = 9.68$, $p\text{-value} = 0.2882$; complete models in table 1.7.2). Still, results from these individual-level regressions should be interpreted with caution given the potential unbalance.

Table 1.7.1: Balance test at individual level.

	T0	T1	T2	p-value	N
Married or in a partnership (dummy)	0.741	0.794	0.763	0.275	1,483
Educational level of complete primary or lower (dummy)	0.358	0.416	0.424	0.423	1,486
Age	31.969	32.429	31.361	0.319	1,486
Has children (dummy)	0.808	0.903	0.824	0.001	1,486
Household size	4.633	4.343	4.641	0.186	1,486
Identifies with indigenous group (dummy)	0.833	0.779	0.841	0.437	1,472
Speaks indigenous language (dummy)	0.465	0.292	0.489	0.218	1,486

All variables from survey.

Table 1.7.2: Omnibus Balance test using survey sample and variables.

	T0 vs T1	T0 vs T2	T1 vs T2
Married or in a partnership (dummy)	0.056 (0.162) [0.732]	-0.012 (0.179) [0.946]	-0.068 (0.188) [0.719]
Educational level of complete primary or lower (dummy)	0.317 (0.218) [0.145]	0.437 (0.256)* [0.087]	0.108 (0.270) [0.690]
Age	-0.010 (0.010) [0.356]	-0.025 (0.015)* [0.095]	-0.015 (0.015) [0.308]
Has children (dummy)	0.816 (0.307)*** [0.008]	0.273 (0.230) [0.234]	-0.474 (0.292) [0.105]
Household size	-0.073 (0.056) [0.193]	-0.019 (0.048) [0.692]	0.058 (0.053) [0.271]
Identifies with indigenous group (dummy)	-0.119 (0.244) [0.627]	-0.025 (0.235) [0.916]	0.076 (0.261) [0.771]
Speaks indigenous language (dummy)	-1.162 (0.560)** [0.038]	-0.238 (0.574) [0.678]	0.921 (0.563) [0.102]
Yucatán (dummy)	0.764 (0.917) [0.405]	0.525 (0.874) [0.548]	-0.257 (0.873) [0.768]
Constant	0.076 (0.539) [0.887]	0.593 (0.628) [0.344]	0.440 (0.543) [0.418]
Wald Chi2	23.5597	4.6559	9.6796
p-value	0.0027	0.7936	0.2882
Pseudo R2	0.0546	0.0155	0.0416
N	937	1,008	993
Specification	Logit	Logit	Logit
Base	T0	T0	T1

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. P-values in squared brackets. Robust standard errors clustered by localities in parenthesis. Coefficients are log odds.