Dry Promotions and Community Participation:
Evidence from a Natural Field Experiment in Brazilian Fishing Villages

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Abstract: This paper investigates the role of dry promotions for community participation in eight Brazilian fishing villages. We randomly promoted some fishermen to assistants before the start of an environmental program, increasing their responsibilities but not providing any monetary compensation. Thereafter, we study whether they engage more in conservation behavior during this program. The data shows that promoted fishermen provide substantially more effort, which suggests that such promotions may be a cost-effective tool to stimulate cooperation and community participation.

Key words: Behavioral economics, community participation, common pool resource, cooperation, natural field experiment, promotions.

JEL Codes: C93, O33

1. Introduction

The management of common pool resources challenges resource users, managers, and policy makers on all continents. Probably most rival and non-exclusive resources such as fisheries and forests are overexploited and many are already depleted. Yet, there is hope that more common pool resources can be sustained than predicted by standard economic theory (Hardin, 1968). The seminal works by Elinor Ostrom (1990, 2000, 2010) and others (Baland and Platteau, 1996; Berkes and Folke, 1998; National research council, 2002) provide numerous examples of successful community management and suggest that community participation is crucial for resource users to cooperate in sustaining resources.

While there is also evidence for mixed success of community participation, it seems that early involvement of beneficiaries is crucial (Olken, 2007; Banerjee et al, 2010; Duflo et al, 2014). For this reason we investigate a potential novel tool to immediately stimulate community participation: *dry promotions*.[1] By dry promotions we mean promotions that affect the position within a hierarchy, may affect responsibilities, but do not involve material benefits. Yet, like non-monetary gifts (Falk, 2008) or awards (Kosfeld and Neckermann, 2011) they may still increase recipients' cooperativeness if they trigger reciprocity (Rabin, 1993; Fehr et al, 1997; Charness and Rabin, 2002; Dufwenberg and Kirchsteiger, 2004) or increase social status (Ball et al, 2001; Auriol and Regis, 2008; Ariely et al, 2009).

We experimentally investigate the impact of dry promotions on community participation during an environmental program that we implemented in eight traditional fishing villages in Brazil. One main goal of this environmental program was to start mitigating overfishing by familiarizing fishermen with a different catch technology. To initiate this process, the program provided all participants with materials to manufacture new shrimp traps that exploit shrimp resources less than the shrimp traps that they typically used. Already before the start of this environmental program, we randomly promoted approximately one-third of the participants to 'assistants'. Assistants received a certificate and a telephone card. Their only task was to give this telephone card to other participants who wanted to get in touch with us. As the setting is remote and many participants did not have cellphones, we could in this manner enable participants to get in touch with us in a timely manner and assign a

[1] Dry promotions are common in academia. For example, the promotion to Head of Department typically increases responsibilities but not salary.

responsibility in a natural manner. We measure the participants' engagement in conservation behavior by the quantity of shrimp traps that they manufactured. Our conjecture is that promoted participants participate more in community management and consequently manufacture more shrimp traps.

We find indeed that the promotion substantially increased engagement in conservation behavior. Fishermen, who were promoted manufactured *on average 23%* more traps and provided in total approximately *12 hours* more community work than fishermen who were not promoted. In addition, we find suggestive evidence that the efficacy of the promotion depends on the participants' environmental perceptions and that optimistic environmental perceptions about mitigating overfishing are important for the promotion to have an impact.

To the best of our knowledge this is the first experimental study on the relevance of dry promotions for cooperation, community participation, and community resource management. Our study contributes to the literature on community resource management (Baland and Platteau, 1996; Agrawal, 2001; Cavalcanti et al, 2013) and may be of practical relevance for researchers, policy makers, and managers interested in tools to increase the effectiveness of community participation (Olken, 2007; Banerjee et al, 2010; Chavis, 2010; Labonne and Chase, 2011; Bjorkman and Svensson, 2012; Duflo et al, 2012).

Our study is also related to the literature on gifts (Al-Ubaydli et al, 2006; Gneezy and List, 2006; List, 2006; Alpizar et al, 2008; Falk 2008; Bellemare and Shearer, 2009; Kube et al, 2012) and awards (Kosfeld and Neckermann, 2011), and empirical and theoretical work on status and social recognition (Besley and Ghatak, 2008; Ariely et al, 2009). This literature suggests that gifts and awards can motivate agents to overcome free-riding incentives because many individuals are reciprocal and strife for social recognition or social status.[2] [3] Our dry promotion also likely benefits from these two behavioral responses. One important difference between gifts and promotions is that gifts in contrast to promotions are unlikely to affect social

[2] However, this evidence also suggests that gifts and awards do not always trigger the desired behavior (Al-Ubaydli et al, 2006; Gneezy and List, 2006; List, 2006) or only marginally (Alpizar et al, 2008).

[3] The evidence comes from laboratory and field studies showing that gifts and awards can sometimes motivate employees to provide more effort for their employers or motivate individuals to donate more. We are not aware of any study investigating the power of gifts and awards for community participation and community resource management.

status.[4] One important difference between awards and our promotion is that awards are distributed based on merit whereas our promotion was distributed based on luck – it was a randomly allocated positional good.[5]

Importantly, these differences render it possible that such random promotions are applicable in different circumstances than gifts and awards. They may be particularly useful when there is little information available about individual achievements (thus the implementation of awards is difficult), social status plays an important role (thus the distribution of gifts may not trigger an optimal response), and no funds are available for costly awards or gifts. Such environments are probably not unusual when external actors help implementing social programs whose success depends on community participation.

2. Field setting, environmental program and natural field experiment

2.1 Field setting

The field setting for this natural field experiment on dry promotions and community management is in northeastern Brazil in the state of Bahia. We study community management in eight small traditional fishing villages that are located around a lake. Fishing is the main profession in these villages and provides the fishermen with income and nutrition. Many fishermen focus on catching shrimp. Fishermen go fishing the whole year and for typically six days per week. Shrimp are a common pool resource and there is open access to the shrimp resources. There are no legal regulations with regard to the catching of shrimp.

The shrimp population in this lake appears to be in dramatic decline. Many fishermen are concerned about overfishing and can in recent years barely support livelihood needs. Many are convinced that the excessive use of shrimp traps called 'Garrafas' has significantly contributed to this decline. Garrafas are traps made of plastic bottles in which all sizes of shrimp; i.e. small, infertile, and fertile shrimp are

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[4] It seems plausible that gifts that significantly increase material wealth also affect social status if individuals associate material wealth with social status. However, the studies on gifts typically use gifts of very low material value that are very unlikely to significantly affect material wealth.

[5] Although participants were promoted based on luck, the promotion may still trigger reciprocity (as receiving a certificate can arguably even in the absence of intent be interpreted as a kind action) and affect social status as social status can be achieved or ascribed.

caught. This type of trap was introduced in the 1980s and has replaced the more traditional ‘Cofo’ trap. Cofos are traps made of bamboo of palm tree stem and proper roots in which in comparison to the Garrafas fewer small and infertile shrimp are caught. The use of Garrafas thus endangers the shrimp population more than the use of Cofos (see appendix figure A). In addition, many fishermen complain about the pollution caused by thousands of Garrafas left in the lake that in contrast to Cofos do not easily degenerate.

2.2 Environmental program

We implemented an environmental program in these eight fishing villages with 154 fishermen (for a different paper on this environmental program – but on not the natural field experiment – see Cavalcanti et al, 2013). One main goal of the environmental program was to familiarize fishermen with the less exploitative shrimp trap (Cofo) to mitigate overfishing. This environmental program was based on the ideas of local fishermen who believed that overfishing could be reduced through replacing Garrafas by Cofos. During the environmental program all participating fishermen were instructed on how to manufacture Cofos and they also received at no cost all necessary materials to manufacture a considerable quantity of Cofos.

The terms of the environmental program were as follows. First, participants took part in a one-day workshop that explained the program and the manufacturing of Cofos. Second, they received the complete set of materials (knife, pliers, proper roots, wire, and palm tree stems) to manufacture 20 Cofos. Third, two weeks after the distribution of materials and randomization into treatments we visited the participants in their house and measured how many Cofos they manufactured. The participants could keep their manufactured Cofos. Fourth, thereafter participants took part in a meeting where we distributed new Cofos to the participating villages depending on the quantity of Cofos manufactured in this village.

The fourth part was implemented to provide the participants with an additional incentive to manufacture Cofos and to make focal the positive externality of Cofo manufacturing. More precisely, at the entry workshop we informed each participant that for each Cofo he manufactured the program would contribute three already manufactured Cofos that will be equally distributed among the participants in his village. In this manner, participants could receive up to 80 Cofos in this program, which is approximately the typically considered sufficient quantity for fishing (80 – 100 Cofos). For instance, in a village with 25 participants where 400 Cofos were manufactured, the program provided this village with 1200 Cofos and each participant in this village could expect to receive 48 Cofos independently of how many Cofos a given participant manufactured. Thus, the environmental program mirrors a collective action problem as participants can free-ride or cooperate; and in the latter case there is a positive externality on other participants and their own village.

Follow-up surveys indicate that the environmental program had a significant temporal impact on fishermen. Almost 90% of 78 interviewed fishermen report to have used the manufactured Cofos for fishing and 39% believe that the fishing conditions have improved after the program (41.6% believe that the fishing conditions did not change and 19.5% believe that the fishing conditions worsened). In addition, 55.9% believe that the program has improved a sense of community and 74% report that they personally benefited from the program. However, two and a half years after the program only 4% continued frequently using Cofos. The fishermen refer to three main reasons why they discontinued using Cofos: lack of materials to manufacture Cofos (42.1%), low efficiency (29.8%), and difficulty in manufacturing Cofos (15.8%).

2.3 Natural field experiment

All participants in this environmental program took also part in a natural field experiment. At the beginning of the program we announced that we would need some assistants who help us that all participants could stay in touch with us during the Cofo manufacturing period (as many participants lived in remote locations, did not have easy access to telecommunication but may experience problems such as material shortages etc.). We asked whether there are participants who did not want to serve as assistants – there were none. Then, we announced that we would select assistants based on a lottery draw to implement the selection in a fair manner. More precisely, we placed small pieces of paper with the participants' names in a hat and then one participant drew up to one-third (24% - 33% depending on village) of the participants' names who then were announced as our assistants. In this way it became common knowledge who was promoted. We chose (close to) ⅓ for two main reasons. First, we needed significantly less than ½ to of the participants to be assistants. Second, we needed to choose a fraction large enough to have enough observations from assistants. For the same reasons, we conducted the experiment in all eight villages.

The lottery was conducted in front of the participants such that they could see that the selection of assistants was purely random. The lottery was our randomization mechanism and categorized participants into two main categories: promoted participants (assistants) and not-promoted participants (non-assistants). We did not tell the participants that we will use this randomization to test the role of random dry promotions promotions and we did not observe that participants found this procedure in any way artificial, unusual, or even suspicious.

All assistants received a telephone card with a small value and a one-page certificate (see Appendix A). In this certificate we thanked assistants for their help and community work. The certificate was handed already immediately after the selection without knowing the assistants' actual behavior during the environmental program.

3. Experimental findings

Table 1 provides summary statistics of control variables and a randomization check. We observe that the randomization was successful as there are no significant differences between promoted and not promoted participants for all variables but education. We control for education in our regressions.

[INSERT TABLE 1 ABOUT HERE]

On average, the 154 participants manufacture 8.64 (s.d. 7.9) out of 20 possible shrimp traps; i.e. they used 43.2% of the provided materials. There is large variance in conservation behavior between participants. Half of the participants do either not at all manufacture traps (29.9%; n = 46) or manufacture the maximum possible quantity of 20 (20.1%; n = 31). The remaining other half of the participants manufactures between 1-19 traps. Figure 1 illustrates histograms for the traps manufactured depending on whether the participants were promoted (right side; n = 43) or not (left side; n = 111). There are clearly visible differences: The mode of participants who were not promoted was to not manufacture any traps (32.4%) whereas the mode of participants who were promoted was to manufacture the maximal possible quantity of 20 traps (27.9%). In contrast, only 17.1% of the not promoted manufacture 20 traps and only 23.3% of the promoted do not manufacture any trap. Promoted participants manufactured *on average 23.6%* more traps (10.02 vs. 8.11). The raw difference between promoted and not promoted is statistically significant at p = 0.151 using a two-sided Mann-Whitney test. Below we will provide extensive evidence that this difference becomes significant at conventional levels after taking into account village fixed effects and control variables.

[INSERT FIGURE 1 ABOUT HERE]

Additional pieces of evidence that promoted participants engaged more in conservation comes from a post-experimental survey. For example, we asked participants how many hours it took them to manufacture a single trap.[6] On average, promoted participants report to spend 3.1 hours per trap whereas not promoted participants report to spend only 2.2 hours per trap. This difference is highly significant (n = 121; p = 0.017; Mann-Whitney test) and suggests that the quality of traps from promoted fishermen is superior. The difference in average time to manufacture a single trap translates into 12.6 additional hours that promoted fishermen spent on average for community work (taking into account the different quantities manufactured). In addition, we asked whether participants have ever used the manufactured traps (promoted 95.5% answered with yes; non-promoted 87.3%), personally benefited from the program (promoted 77.3% answered with yes; non-promoted 72.2%), and whether they believe the program has improved the sense of community (promoted 63.4% answered with yes; non-promoted 53.7%). These differences – while insignificant due to small samples – provide speculative evidence that promotions had also an impact beyond the manufacturing of traps.

Returning to our measure of traps manufactured, Table 2 presents the effect of the promotion on village level. We observe that promoted participants manufacture more traps in six out of eight villages. In five of the six villages the differences are substantial and vary from 19.5% to 161.2%, in one village the difference is statistically significant (village 3, p=0.043). In two villages promoted participants manufacture less than not promoted participants but the differences are small (-7.5% to -8.1%) and clearly insignificant (p>0.575).

[INSERT TABLE 2 ABOUT HERE]

[6] These data are in contrast to the previous analysis based on self-reports. Thus, one should be careful in interpreting the absolute values, as it seems likely that participant's over-report the time spent on conservation behavior, and possibly more so in the treatment condition.

We provide three Tables (3–5) to investigate the relevance of the promotion taking into account other potentially important variables and the extremes of our dependent variable. Table 3 provides Tobit specifications censored at 0 and 20 to account for the fact that half of the data on trap manufacturing is at the minimal (0) or maximal value (20). Table 4, instead, presents OLS specifications and Table 5 provides a Logit specification using only data from participants who manufactured the minimal or maximal value (50% of the sample). Each Table provides a different weighting of the extremes but we hope that their combined use enables a comprehensive view on the variable relationships.

All three tables present the same four specifications. Specification 1 regresses traps manufactured only on a dummy (*promotion*) that equals one if the participant was promoted. Specification 2 uses in addition our set of control variables presented in Table 1 (*optimistic environmental perception*[7], *gender*, *seniority* (=years of fishing experience), *education* (=years of schooling), *fishing intensity* (=how many hours fishing per week), and *household size* (=members who live in same household)) that were collected in a *pre*-experimental survey. Specification 3 corresponds to specification 1 but is regressed on the interaction *optimistic environmental perception* × *promotion.* Similarly, specification 4 corresponds to specification 2 but also controls for *optimistic environmental perception* × *promotion.* In addition, all four models in all three tables include village fixed effects to control for differences in trap manufacturing across fishermen villages.[8] [9]

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[7] The participants were asked about the likeliness that overfishing can be mitigated. They could express their perceptions in five categories: very high, high, medium, low, or zero probability. For illustrative reasons and because of small numbers of observations (the categories medium, low, and zero were rarely chosen (5.4%, 2%, 4%)), we decided to pool these three categories with the next highest category high (49%).

[8] We *conservatively* use robust standard errors in these models that are *not* clustered on village level. Clustering standard errors on village level would in our data significantly reduce the standard errors and lead to substantially lower p-values. For example, in Model 1, Table 3, the standard error for the certificate would decrease from 2.448 to 2.001 after clustering, leading to a substantially lower p-value of 0.047.

[9] In an online appendix (attached at the end of this manuscript), we present four additional models in Table A to demonstrate the robustness of our findings. More precisely, we control in addition for two variables (social integration and participation) that have been shown to play an important role for trap manufacturing and are discussed and reported in Cavalcanti et al (2013).

We chose these control variables because they may be related to trap manufacturing in the following manner. *Environmental perceptions* about the likeliness that overfishing can be mitigated can play an important role for cooperation to manufacture new traps because the Cofos' efficacy very likely depends to a larger extent on the state of overfishing than the Garrafas' efficacy. In a state where overfishing cannot be mitigated, Cofos perform poorly relative to Garrafas because there is a very low fraction of large shrimp left in the lake. Thus, having optimistic environmental perceptions may be crucial for the willingness to manufacture Cofos. *Gender* may play a role as trap manufacturing is physically demanding and thus men may have an advantage over women. *Education* may be important because it may correlate with a host of other variables like curiosity or IQ that may be significantly related to the adaption of a new technology like ours. *Seniority* and *fishing intensity* may proxy the fishermen's dependency on fishing resources which in turn may be related to their willingness to manufacture new traps. Finally, *household size* may be important as participants in larger households may receive more help in manufacturing traps and thus be able to manufacture more traps.

[INSERT TABLES 3-5 ABOUT HERE]

Regressing Cofo manufacturing only on promotion and controlling for village fixed effects (specification 1) shows that the promotion marginally increased community participation: the p-values for the promotion dummies are 0.104 (Table 3), 0.117 (Table 4), and 0.049 (Table 5). The effect of the promotion becomes more robust and more substantial (coefficients increase) after including control variables in our regressions (specification 2): the p-values for the promotion dummies are *0.057* (Table 3), *0.075* (Table 4), and *0.064* (Table 5). The coefficients in the two OLS models show a large effect of the promotion. Promoted participants manufactured on average 2 to 2.31 Cofos more, which is 23-26.7% of the mean and 0.25-0.29 of its standard deviations.

In addition, as expected we observe in specification 2 that fishermen with more optimistic perceptions tend to be more likely to manufacture traps ($p = 0.077$ and $p = 0.083$ in Tables 3 and 4; but $p = 0.78$ in Table 5) and that men tend to be less likely to manufacture traps ($p = 0.061$ and $p = 0.107$ in Tables 3 and 4; but $p = 0.754$ in Table 5).[10] Education is marginally positively related to Cofo manufacturing in Table 5 ($p=0.084$), but not in Tables 3 and 4 ($p>0.253$). The other variables *seniority, fishing intensity* and *household size* are not related to trap manufacturing at the 10%-significance level.

Further, we test whether the promotion has a differential effect depending on the environmental perceptions about overfishing and find evidence for significant *environmental perception* × *promotion* interactions. First, we observe that promoted fishermen with more optimistic environmental perceptions (n = 14) manufacture approximately twice as many traps as fishermen with less optimistic environmental perceptions (n = 27; 14.8 vs. 7.3; $p < 0.01$, Mann-Whitney test). Further econometric evidence comes from Tables 3-5: *environmental perception* × *promotion* is significant at $p < 0.045$ in specification 3 and at $p < 0.075$ in specification 4. In addition, we observe in these specifications that the promotion has no significant impact on fishermen with less optimistic environmental perceptions and that optimistic environmental perceptions play only a minor and insignificant role for not promoted fishermen.

4. Discussion

In this study, we present novel evidence for the efficacy of randomly allocated positional goods for community participation in a natural field experiment. We believe that our results provide first suggestive evidence that random dry promotions can be a useful tool to foster cooperation and community participation and this at very low implementation costs. However, certainly much more evidence is needed to establish the robustness, significance, and scope of such promotions. For example, it would be important to know whether the impact depends on public disclosure, why the promotion has a positive impact on community participation in some but not all of our sample villages, and whether dry promotions based on merit would trigger more, equal, or less conservation behavior.

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[10] This finding is in line with research suggesting that women are in some contexts more cooperative than men (Croson and Gneezy, 2009). However, the finding may be subject to the small sample. There are only 38 women in the sample and only seven women who received the promotion. Further analysis shows that there is no significant interaction effect between the promotion and gender.

A shortcoming of our experiment is the relatively small sample size in the environmental program and the resulting lack of comparable villages in which the experiment did not take place. While we did not observe that the experiment had negative influences on not promoted fishermen (e.g. in the form of disappointment or transfer of responsibility), we cannot completely exclude it. However, the fact that there is no significant difference in trap manufacturing between promoted and not promoted participants with less optimistic environmental perceptions suggests that there are no such negative influences.

Our favorite explanation for the underlying mechanism behind the overall well functioning of the promotion is based on reciprocity and social status. The idea is that participants feel rewarded by being promoted and experience an increase in their social status even though the promotion was not based on performance. This explanation is consistent with previous findings suggesting that gifts and awards are useful means to trigger cooperation (Alpizar et al, 2008; Falk, 2008; Kosfeld and Neckermann, 2011; Ariely et al, 2009). One alternative explanation is that the promotion increased the social pressure and awarded participants felt more observed. While this is plausible, we still find a significant impact of the promotion even after controlling for individual social integration, a proxy for monitoring possibilities and thus social pressure (see Cavalcanti et al, 2013 and Table A). Another potential explanation is that the promotion induced identification with the environmental program and thus increased cooperation (Ostrom, 2000; Pierce et al, 2001; Stiglitz, 2002). We find some suggestive evidence that this may be partly the case. When we control for participation, a variable that defines whether a participant has helped developing the environmental program, the impact of the promotion decreases somewhat (see also Table A).

Regardless of the ultimate mechanisms at play, one major advantage of random dry promotions is that they are widely applicable, and unlike merit-based promotions or awards do not rely on additional information such as performance which is often difficult and expensive to obtain. Future research may test the relevance of the different underlying mechanisms and tackle the relative performance of such promotions as compared to other related tools such as awards and gifts.

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Figure 1

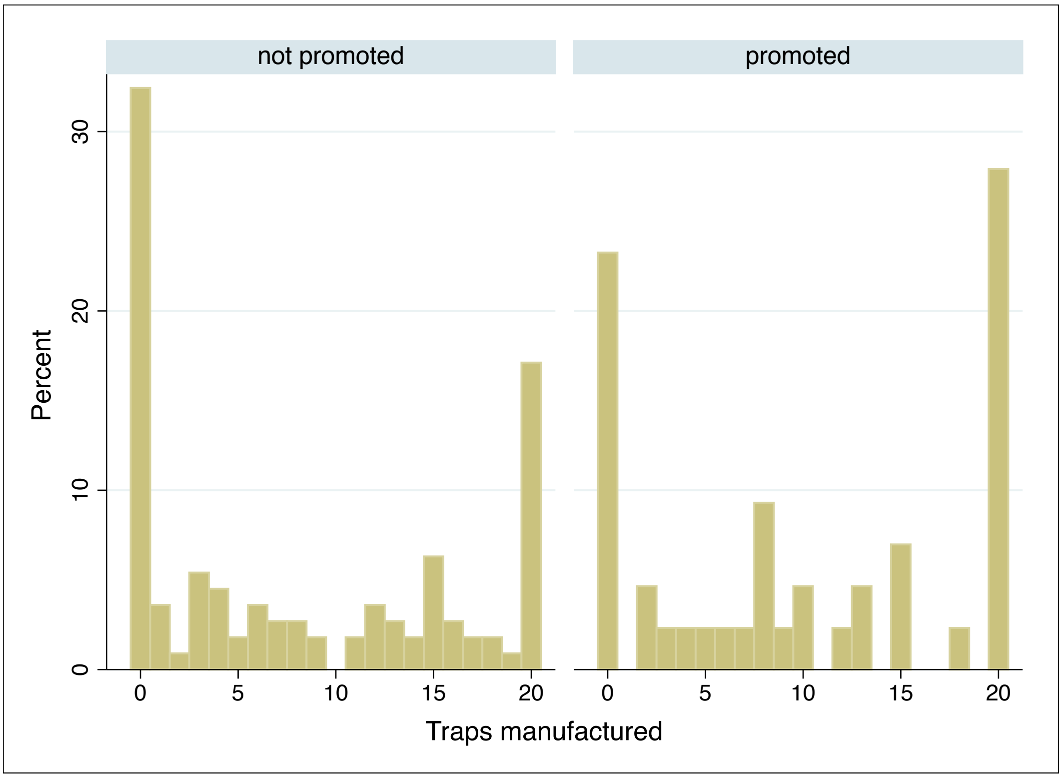


FIGURE 1 – Conservation behavior during environmental program depending on whether participant was promoted.

Tables 1-4

TABLE 1—SUMMARY STATISTICS & RANDOMIZATION CHECK

	Overall	Without Certificate	With Certificate	Test of difference
		means		*p-value**
Gender (1 = male, 0 = female)	0.75 (154) [0.43]	0.72 (111) [0.45]	0.84 (43) [0.37]	0.150
Seniority (in years)	17.93 (153) [12.25]	18.23 (110) [12.76]	17.19 (43) [10.96]	0.637
Education (in years)	3.30 (152) [2.61]	3.01 (111) [2.54]	4.07 (41) [2.68]	0.026
Fishing intensity (in hours per week)	21.94 (154) [10.51]	22.20 (111) [10.76]	21.30 (43) [9.93]	0.636
Household size (members in household)	5.43 (154) [2.90]	5.33 (111) [2.96]	5.67 (43) [2.77]	0.515
Optimistic environmental perceptions (1 = perception that overfishing can be very likely mitigated, 0 otherwise)	0.40 (149) [0.49]	0.42 (108) [0.50]	0.34 (41) [0.48]	0.456
Laboratory cooperativeness (0 - 10 contributions in public goods game)	3.64 (154) [2.77]	3.63 (111) [263]	3.67 (43) [3.14]	0.930
Social Integration (Friendship degree centrality 0 - 63.6)	20.61 (154) [12.03]	19.82 (111) [11.79]	22.65 (43) [12.58]	0.191
Participation (0 = did not help develop environmental program in the past, 1 otherwise)	0.40 (154) [0.49]	0.36 (111) [0.48]	0.49 (43) [0.50]	0.198

* Number of observations (individuals) in round brackets. Standard deviations in square brackets. T-tests used for all non-binary variables. For binary variables, we use Fisher exact test. All p-values are for two-sided tests.

TABLE 2 — PARTICIPATION DEPENDING ON PROMOTION & VILLAGE

Village	without certificate		with certficate	% difference,
	mean, (N), [s.d.]			*p-value**
1	6.8	<	9	32.4%
	(6) [7.14]		(3) [10.15]	*0.791*
2	16.5	<	18	9.1%
	(8) [7.23]		(4) [4]	*0.911*
3	4.9	<	12.8	161.2%
	(19) [7.00]		(6) [8.45]	*0.043*
4	7.7	<	9.2	19.5%
	(16) [7.69]		(6) [9.17]	*0.603*
5	3.4	<	4.1	20.6%
	(17) [6.53]		(7) [7.31]	*0.791*
6	6.6	>	6.1	-7.5%
	(17) [7.08]		(8) [5.79]	*0.953*
7	12.6	<	15.2	20.6%
	(19) [8.26]		(6) [7.91]	*0.466*
8	11.2	>	10.3	-8.1%
	(9) [5.63]		(3) [4.51]	*0.575*
total	8.1	<	10	23.6%
	(111) [7.85]		(43) [7.92]	*0.151*

*Number of observations (individuals) in round brackets. Standard deviations in square brackets. P-values for two-sided Wilcoson ranksum test.

Table 3: Community participation depending on promotions (tobit)

Dependent variable: Quantity of shrimp traps manufactured (0-20)				
Model	(1)	(2)	(3)	(4)
Promotion	4.009	4.856*	0.084	0.634
	(2.448)	(2.525)	(3.023)	(3.443)
Optimistic environmental perception?		4.032*	1.588	1.447
		(2.265)	(2.569)	(2.639)
Promotion × Optimistic environmental perception			10.788**	10.324*
			(5.336)	(5.745)
Gender		-6.128*		-5.100
		(3.247)		(3.254)
Seniority		0.108		0.089
		(0.094)		(0.092)
Education		0.423		0.518
		(0.501)		(0.497)
Fishing intensity		0.074		0.090
		(0.096)		(0.096)
Household size		0.644		0.689
		(0.463)		(0.447)
Constant (sigma)	12.176***	11.698***	11.626***	11.503***
	(1.269)	(1.289)	(1.210)	(1.239)
Village fixed effects?	yes	yes	yes	yes
Pseudo r2	0.0549	0.0772	0.0704	0.0824
N	154	146	149	146

Notes: Robust standard errors in parentheses. * = p<.1, ** p<.05, *** p<.01, 46 observations are left-censored at 0, 31 (29) observations are right censored at 20 in models 1 and 3 (2 and 4). Promotion = 1 if participant was promoted, 0 otherwise, optimistic environmental perception = 1 if participant believes that it is very likely that overfishing can be stopped, 0 otherwise, gender =1 if male, 0 if female, seniority = years of fishing professionally, education = years of schooling, fishing intensity = hours spent at lake fishing per week, household size = number of persons in household.

Table 4: Robustness Check for Community participation depending on promotions (OLS)

	Dependent variable: Quantity of shrimp traps manufactured (0-20)			
Model	(1)	(2)	(3)	(4)
Promotion	1.999	2.310*	-0.094	0.184
	(1.269)	(1.286)	(1.556)	(1.714)
Optimistic environmental perception?		2.099*	0.849	0.753
		(1.201)	(1.377)	(1.421)
Promotion × Optimistic environmental perception			5.729**	5.254*
			(2.650)	(2.820)
Gender		-3.001		-2.445
		(1.847)		(1.866)
Seniority		0.058		0.050
		(0.050)		(0.049)
Education		0.244		0.283
		(0.258)		(0.254)
Fishing intensity		0.024		0.030
		(0.054)		(0.054)
Household size		0.302		0.323
		(0.258)		(0.250)
Constant	6.889***	0.042	2.849	0.729
	(2.467)	(2.405)	(1.745)	(2.525)
Village fixed effects?	yes	yes	yes	yes
r2	0.248	0.310	0.328	0.347
N	154	149	146	146

Notes: Robust standard errors in parentheses. * = p<.1, ** p<.05, *** p<.01, Promotion = 1 if participant was promoted, 0 otherwise, optimistic environmental perception = 1 if participant believes that it is very likely that overfishing can be stopped, 0 otherwise, gender =1 if male, 0 if female, seniority = years of fishing professionally, education = years of schooling, fishing intensity = hours spent at lake fishing per week, household size = number of persons in household.

Table 5: Robustness Check for Community participation depending on promotions (Logit)

	Dependent variable: 0 if zero traps manufactured, 1 if 20 traps manufactured			
Model	(1)	(2)	(3)	(4)
Promotion	0.185**	0.191*	-0.019	-0.053
	(0.094)	(0.103)	(0.118)	(0.136)
Optimistic environmental perception?		0.025	-0.051	-0.092
		(0.088)	(0.102)	(0.090)
Promotion × Optimistic environmental perception			0.552***	0.532**
			(0.186)	(0.210)
Gender		-0.081		-0.008
		(0.257)		(0.244)
Seniority		-0.000		0.000
		(0.004)		(0.003)
Education		0.034*		0.030
		(0.020)		(0.020)
Fishing intensity		-0.003		-0.004
		(0.005)		(0.005)
Household size		0.018		0.018
		(0.020)		(0.017)
Village fixed effects?	yes	yes	yes	yes
N	76	74	74	74

Notes: Robust standard errors in parentheses. * = p<.1, ** p<.05, *** p<.01, Average marginal effects reported. 1 observation dropped in models 1-4 due to perfect multicollinearity. Promotion = 1 if participant was promoted, 0 otherwise, optimistic environmental perception = 1 if participant believes that it is very likely that overfishing can be stopped, 0 otherwise, gender =1 if male, 0 if female, seniority = years of fishing professionally, education = years of schooling, fishing intensity = hours spent at lake fishing per week, household size = number of persons in household.

Appendix

A. Certificate for promoted individuals:

Certificate for voluntary work

Date___________

Ladies and Gentlemen,

It is my pleasure to give this certificate to _____________________ who has served as an important assistant for the implementation of an environmental program in the protected area of Lago Pedra do Cavalho and volunteered to spend time and effort to improve the situation for the fishermen in the community __________________. The environmental program has the goal to improve the current fishing situation by exchanging shrimp traps to cofos.

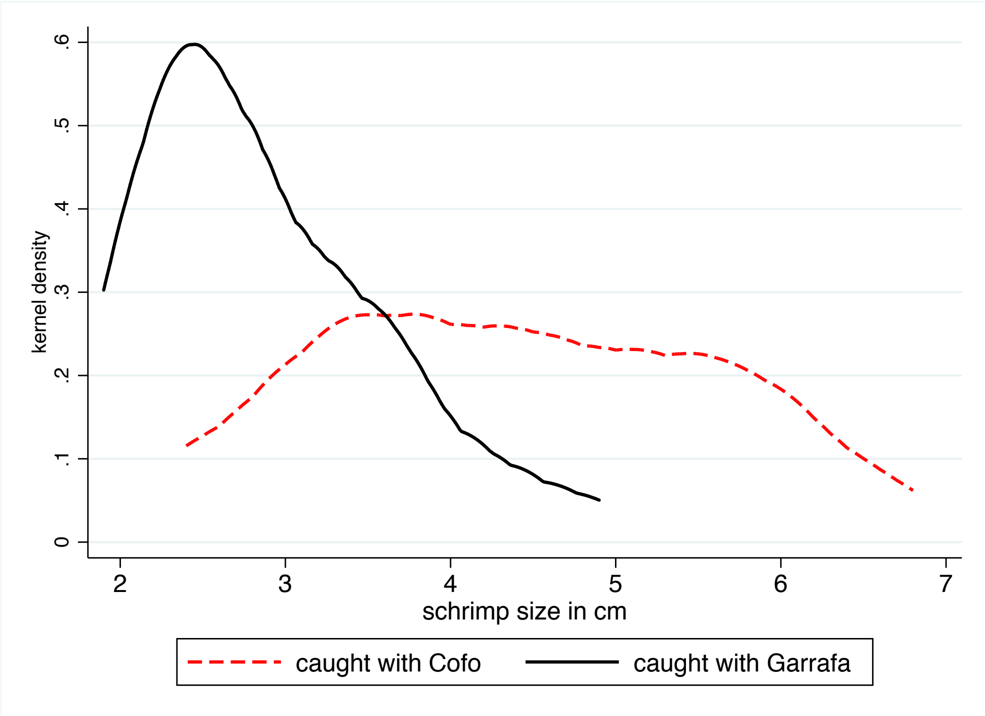
We are very thankful for his help and hope all the best for __________________ and his family.

Yours sincerely,

Signature ________________ (Program Leader)

Signature ________________ (Program Coordinator)

Appendix Figure A



Notes: Data comes from a random sample of 50 shrimp caught with Cofos and Garrafas. The shrimps were caught in the same spot and by the same fisherman. Shrimp reach their fertility at approximately three centimeters.

B. Further Robustness Checks

Table A presents four regression models that correspond to the regressions in the manuscript but control in addition for social integration (models 1-4), participation (models 3-4), and laboratory cooperativeness (models 1-4). Models 2 and 4 control in contrast to models 1 and 3 for the interaction between promotions and environmental perceptions. Social integration and participation are importantly related to the quantity of shrimp traps manufactured, as reported in Cavalcanti et al (2013).

Social integration is a variable on individual level for social network centrality measured by a friendship network. Higher numbers mean that an actor is more central. Participation is a binary variable on individual level indicating whether an actor has participated in the development of the environmental program (value = 1) or not (value = 0) by attending a fishermen's meeting that was offered in five of the eight fishing villages. Laboratory cooperativeness, an insignificant control variable in Cavalcanti et al (2013) measures contributions in an anonymous one-shot public goods experiment.

The regressions show that social integration and participation are always significantly related at the 5%-level to shrimp trap manufacturing after controlling for promotions corroborating the findings in Cavalcanti et al (2013).

In addition, the regressions also show that the coefficients and p-values of the promotion and the interaction with environmental perceptions reported in CL are little subject to the inclusion of social integration, participation, and laboratory cooperativeness.

More precisely, in Table A, model 1 promotion is significant at the 10%-level and the coefficient for promotion is 4.126. In CL, Table 1 promotion is significant at p = 0.104 (model 1) and p = 0.057 (model 4) and the coefficients are 4.009 (model 1) and 4.856 (model 4). In Table A, model 3, promotion is significant at p=0.222 and the coefficient is 2.98. Further analysis shows that this decline is due to a weak positive correlation between promotion and participation (r=0.12, p=0.147) and the relatively small sample size (note that this correlation has to be due to chance as promotions were randomly allocated).

The interaction between promotions and environmental perceptions in Table A is significant at the 10%-level (models 2 and 4) and the coefficients are 10.33 (model 2) and 9.28 (model 4). In CL, in Table 1 the same interaction is significant at p=0.045 (model 2) and p=0.075 (model 5) and the coefficients are 10.79 (model 2) and 10.32 (model 5).

Table A: Further robustness checks for community participation depending on promotions (tobit)

Dependent variable: Quantity of shrimp traps manufactured (0-20)				
Model	(1)	(2)	(3)	(4)
Promotion	4.126*	-0.105	2.976	-0.704
	(2.482)	(3.318)	(2.427)	(3.331)
Optimistic environmental perception?	3.474	0.917	2.719	0.488
	(2.261)	(2.685)	(2.254)	(2.662)
Promotion × Optimistic environmental perception		10.331*		9.277*
		(5.764)		(5.566)
Gender	-7.276**	-6.253*	-6.581**	-5.705*
	(3.281)	(3.279)	(3.184)	(3.206)
Seniority	0.068	0.052	0.019	0.008
	(0.095)	(0.092)	(0.097)	(0.095)
Education	0.437	0.537	0.502	0.589
	(0.486)	(0.485)	(0.476)	(0.475)
Fishing intensity	0.103	0.118	0.115	0.128
	(0.100)	(0.101)	(0.100)	(0.102)
Household size	0.737	0.777*	0.628	0.672
	(0.468)	(0.453)	(0.467)	(0.454)
Social integration	0.244**	0.254**	0.209**	0.221**
	(0.110)	(0.111)	(0.105)	(0.107)
Participation			6.782**	6.325**
			(2.958)	(2.921)
Laboratory cooperativeness	0.386	0.293	0.421	0.333
	(0.432)	(0.414)	(0.422)	(0.404)
Constant	11.474	11.277	11.200	11.038
	(1.269)	(1.221)	(1.207)	(1.169)
Village fixed effects?	yes	yes	yes	yes
Pseudo r2	0.084	0.0893	0.0924	0.0967
N	146	146	146	146

Notes: Robust standard errors in parentheses. ***p<0.01; **p<0.05; *p<0.1. 46 observations are left-censored at 0, 29 observations are right censored at 20. Promotion = 1 if participant was promoted, 0 otherwise, optimistic environmental perception = 1 if participant believes that it is very likely that overfishing can be stopped, 0 otherwise, gender =1 if male, 0 if female, seniority = years of fishing professionally, education = years of schooling, fishing intensity = hours spent at lake fishing per week, household size = number of persons in household. Social integration = Index for degree centrality; higher number means more central; measure is normalized and undirected, participation = variable for participation in economic program development: 0 = no participation, 1 = with participation. Laboratory cooperativeness was measured in an one-shot public goods experiment where participants could contribute 0-10 units to a public good.