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What are the potential tradeoffs in the ICRG Intervention?

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Infrastructure for Climate Resilient Growth in India (ICRG) Programme

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Climate awareness and behavioural change in rural India

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Abstract

This paper examines the social norms related to climate-resilient works under MGNREGA and whether climate awareness campaign through ICRG intervention has any impact on influencing such norm. Successful implementation of MGNREGA depends crucially on the climate-awareness of local politicians and common citizens in the decentralised participatory governance structure. Understanding their awareness and social norm around climate protection and how awareness campaign could influence such norm is important for environmental policy since a more incisive understanding of people's preferences and effect of low-cost awareness campaign on behavioural change can aid the design of environmental policies and institutions. Our study shows that awareness campaign through ICRG intervention has a significant effect on subjective beliefs of the people toward climate protection in ICRG villages. Based on standard survey and incentivised survey conducted in ICRG and non-ICRG villages in Bihar and Odisha we find that: (1) respondents in ICRG villages believe that more NRM/ICRG-related work should be undertaken due to climate change which is significantly different from what respondents from non-ICRG villages believe; (2) both common villagers and politicians in ICRG villages are willing to provide significantly more free labour than non-ICRG villages to implement climate-related projects.

JEL Classification: H11, D64, O12
Key-words: MGNREGA, ICRG, politicians, social norm, environmental policy, climate resilience, India

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Introduction

As the recent IPCC report warns, the frequency and severity of the extreme climatic events will increase in the future, with developing countries being the worst affected in terms of damages suffered (IPCC, 2013, 2014). In response, public programs are designed and implemented in developing countries to build resilience in both human and ecological systems that could help adapt with and mitigate to future climate risks (see Jayachandran et al. 2017). In India, government has started investing in climate resilience infrastructure in the rural areas through MGNREGS programme[1]. While the original intention of the scheme was to provide a minimum of 100 days of employment on demand to each rural household, there has been a shift in the scheme's implementation since 2014 to an additional focus on asset creation, particularly those that can be linked to environmental objectives such as water conservation, drought proofing and afforestation (Pankaj 2017).

A key feature of the MGNREGS is that it is implemented by local governments (Gram Panchayats, GP), which comprise elected local politicians from the villages that constitute the GP. These politicians are elected through a conventional democratic process and are responsible for implementing a variety of government-funded development programmes and for decisions about investment in local infrastructure, such as sanitation, drinking water, and roads (Chattopadhyay & Duflo, 2004). Elected representatives and common citizens in a village meet annually, the event is called Gram Sabha, where villagers express their preferences about the type of public projects under MGNREGS (e.g. road construction, water management) should be carried out in the following financial year and the elected representatives commit to

[1] India's MGNREGS is the largest workfare programme in the world, covering 11 per cent of the world's eligible population (Muralidharan et al. 2015) as well as India's main welfare programme for the rural poor (Imbert and Papp 2015). The financial outlay on the NREGS in financial year 2017-2018 is 5775 million US dollars. NREGS is the most important welfare programme for local governments to run, and the most well resourced in India. For example, an average GP in West Bengal spends typically around 25 to 30 million INR (i.e., 250-300 thousand GBP) of which approximately 85% to 90% allocation is for the NREGS.

implement them subject to resource availability.[2] Whether sufficient environmental goods will be created or not through a successful implementation of MGNREGS depends crucially on the climate-awareness and motivation of local politicians (Jenkins and Manor 2017)[3]—their knowledge about climate change and how they could make a difference are the key preconditions of a successful climate protection in rural India. As the decentralised institution relies solely on general citizens' scrutiny on politicians' work (e.g. Bardhan and Mookherjee 2005), it is important that the general citizens should be also aware of costs of climate change on their well-being and how they could contribute to policy implementation by participating in participatory governance.

While elected representatives at the local level in such a decentralised democracy fundamentally affect the environmental outcome and welfare of citizens, holding politicians to account is not always straightforward. The main focus in the literature in reducing such failures has been costly monitoring and financial incentives by the central governments (e.g., Fisman and Miguel 2007; Olken 2007; Duflo, Hanna, and Ryan 2012; Niehaus and Sukhtankar 2013). In emerging economies, public purse constraints make such standard, and often costly, incentive schemes a less attractive option. Viable, less costly alternatives should therefore be considered.

In this paper, we investigate the impacts of a norm-based and low-cost awareness campaign about climate-change on the behaviour of general citizens and politicians. We make use of a recent programme—Infrastructure for Climate Resilient Growth in India (ICRG). ICRG is a Technical Assistance Programme to Ministry of Rural Development (MoRD), Govt. of India, funded by the Department for International Development (DFID). The aim of the

[2] According to the official guideline: Identification and planning of works, developing shelf of projects, ratification and prioritisation of projects as decided by the Gram Sabha.

[3] The NREGS is perhaps the best known example in developing country context of where elected local politicians make a difference in the success of the program. However, there are other cases of the important role that elected local politicians play in delivering social welfare programmes, such as the Bolsa Familia in Brazil and Progresa in Mexico (will cite papers).

programme is, amongst other, to improve the quality of assets built under MGNREGA. It is a four year project (2016-2020) with a 10 million pound budget and it is implemented by four project partners (IPE Global, PWC, Ricardo Energy and Environment and the University of Manchester). This programme has been implemented in 100 administrative blocks of three Indian states—Bihar, Odisha, and Chhattisgarh. As part of the technical support, an awareness programme was run in local language for one year (on average) where common villagers were presented the impact of climate change on their well-being using charts, pictures, and interactive games and lectures. Elected politicians and other local level officials responsible to implement MGNREGS received additional training on this issue and how to build climate resilience infrastructure.

In our study, we randomly chose four ICRG villages and four non-ICRG villages in Bihar and Odisha. We randomly recruit common villagers (i.e. non-politicians) from those villages from a household census. Similarly, for our politician participants, we select randomly from a list of politicians who have won or contested in last 10 years in the village level Panchayat elections. We investigate whether respondents (both politicians and common villagers (i.e. non-politicians)) perceive pro-climate programmes differently in ICRG and non-ICRG villages using a survey. Further we explore whether respondents' willingness to give free labour to implement climate-related works are different in ICRG and non-ICRG villages. More pro-climate perceptions among ICRG respondents and/or more WTW (willingness to work) among ICRG respondents than non-ICRG respondents would suggest that awareness campaign has a positive impact in changing people's behaviour in rural India.

In the standard survey, respondents in ICRG villages believe that more NRM/ICRG-related work should be undertaken due to climate change which is significantly different from what respondents from non-ICRG villages believe. Moreover, in contrast to the respondents in non-ICRG villages, respondents in ICRG villages are willing to work more hours, even without

any monetary remuneration, to implement climate-related projects. These suggest that ICRG intervention, in particular the awareness campaigns, help influence people's perception about adaptive actions to cope up with climate change.

Results from the CVM study shows that both common villagers and politicians in ICRG villages are willing to provide significantly more free labour than non-ICRG villages for implementing climate-related projects. On average, people in ICRG villages are willing to work more than 12 hours/month whereas non-ICRG people are willing to 11 hours/month (and this difference is statistically significant) and ICRG people are more frequently agrees to work more than 12 hours/month (in about 93% of cases) than non-ICRG people (in about 27% of cases). In the regression analysis, we find a similar result—respondents in ICRG villages are willing to work more without money, about 2 hours extra per month, and the result is statistically significant. It implies that respondents in ICRG villages understand the importance of climate-related projects and willing to contribute to climate adaptation. In addition, regression results show that women and higher caste people are willing to work more than male and lower caste people. This provides suggestive evidence that opportunity costs of time is less for female members and higher caste individuals.

Related literature

The dominant theme of this paper is to understand better the social norm related to pro-climate works under MGNREGA and whether awareness campaign through ICRG intervention has any impact on influencing such norm. It is imperative then to outline a definition of a social norm. In short, from a sociological perspective, social norms are informal, conjoint understandings that dictate and govern the behaviour of members of a said society. There is a transactional relationship between one's norms and one's environment. Our social environment even shapes the way we think and how our mind works and grows. Social norms are, however,

not absolutes (Sherif, 1936) . Social norms develop in parallel with relationships and structures of institutions. Therefore, norms can, and do, change in accordance to relevant shifts in the structure and systems that they inherited their existence from. Elster (1989) uses the distinction between homo economicus and homo sociologus to outline his definition of a social norm. He states that the former of the two theories of is guided by pure rationality while the latter's behaviour is dictated by social norms. Elster (1989) continues by stating that rationality states: If you want to achieve Z, do X, while social norms do not care for this outcome orientated approach. Norms function in the sense that there is a social consensus that X is the correct response to action Y – with little concern for whether X will take you closer to your desired outcome Z. For norms to be social, they must be shared by other people and partly sustained by their approval and disapproval (Elster, 1989b). Norms are primarily sustained by feelings of embarrassment, anxiety, guilt or shame (which could also be classified together as a form of intrinsic disutility) that a person suffers at the prospect of, or by, violating them – it is the powerful emotions associated with violating social norms that encapsulate the mind.

The nature of the relationship, and the causation, between rationality and social norms is also one that must be considered. Early, anthropologists and sociologists suggested rationality is guided by social norms while more recent generations suggest that norms are tools to be used and manipulated to achieve one's strategic rational interests (Becker, 1976). For example, Kahn, Lamm and Nelson (1977); and Kahn *et al.* (1982) both highlight that low achievers prefer the norm of equity while high achievers promote pay according to productivity. However, the early theory of the relationship between social norms and rationality also holds strength. For example, the norm of vengeance overrides self-interest (Elster, 1989), at least in the mind of the vengeance seeking, which can be considered a positive thing for society.

Despite the ambiguity of the relationship between self and societal interest and social norms there is no doubt that individuals are sufficiently affected by the influence of social norms.

Therefore, there is numerous ways in which social norms and influence can shift an individual's decision making. Sherif (1936) noted how the stability of norms grew over time, and once committed different groups could be strongly committed on wildly different measurements. This is basic evidence on why nations, cities or even smaller groups of individuals can converge on very different beliefs due to arbitrary starting points (Thaler and Sunstein (2008), Sunstein (2003) and Sherif (1936). This phenomenon is named collective conservatism and highlights individuals' preferences to stick to traditional patterns of behaviour despite the arrival of new evidence or needs. This is also linked with the idea of pluralistic ignorance – the idea that individuals follow an idea or norm not because of rationality or desire but simply due to the belief that the majority of all other individuals desire to follow this pattern of behaviour.

Another interesting point to note about the "mob mind" behaviour that was just mentioned is noted in (Schultz *et al.*, 2007). The paper used the above ideas in a form of a behaviour "nudge" to try and lower energy use in California. Their first approach was to report to all households their level of electricity usage in comparison with the average. This had astounding effects and both high users and low users diverged towards the mean. This was an interesting observation but not exactly advantageous as the gains were balanced by the losses – the boomerang effect. They then furthered the experiment by the use of a smiley or sad face on the reports which accompanied the low users and the high user's energy use respectively. This removed the boomerang effect significantly and suggests that individuals respond to what others do, but further respond to what others think is "good" to do (see Alcott 2011).

The contradiction between rationality and adhering to social norms is further enlightened by Fershtman, Gneezy and List, (2012). The intriguing paper highlights the idea that in every situation there are numerous social norms present. The authors clarify that in each specific situation, the situation itself determines the set of relevant social norms, which in turn defines the set of relevant acceptable decisions. This in turn lets individuals "choose" from this set, and

therefore can choose a social norm that "justifies" their actions. Fershtman, Gneezy and List, (2012) use the example of Fehr and Schmidt's (1999) inequity aversion experiment in comparison with their own modified version to display the theory. This suggests that individuals are often constrained by social norms, but can often cherry pick which social norms that further their self-interest. In the two examples above, individuals were happy to discard the norm of equity for the norm of fair pay for fair work because it suited their rational self-interest.

Therefore, there can be no denial that social norms have a mammoth influence on individual behaviour. However, as also aforementioned, social norms can be shifted and even reversed while also be clever intervention can be used to benefit individuals and society. Here lies the motivation of the paper: whether awareness campaign helps influence social norms in rural India.

Environmental economics is the application of economic principles to sharpen environmental policy to better prevent market failure, reduce environmental risks, increase cooperation and coordination, design more cost-effective incentives, value the environment more accurately, and ensure sustainability. Following the traditional public-choice approach to neo-classical economics, environmental policy is determined by political and economic self-interest—political competition is an important source of internalization of economic externalities (Buchanan and Tullock 1975; Aidt 1998; Oates and Portney 2003; Fredriksson et al 2010; Milner and Olliver 2016). A well run democratic system, with electoral campaign and elections, is an effective institution to discipline politicians as voters can punish them via re-election (e.g., see Ferejohn 1986; Key 1966).

While the role of such social preferences among politicians has been studied for several decades by political scientists and psychologists (see e.g., Calvert 1985; Wittman 1983), the

political economy literature has recently started exploring political competition with political actors and/or voters with non-standard preferences. For example, candidates can have heterogeneous motives, e.g., in two dimensions: policy preferences and lying aversion (Callander and Wilkie 2007), or may have different 'character' (Kartik and McAfee 2007) or skills (Buisseret and Prato 2016). Alternatively, heterogeneity may come from public spirit motives (altruism) and honesty (incorruptibility) (Bernheim and Kartik 2014). Moreover, candidates without such intrinsic motives can signal such unobservable characteristics strategically to voters to gain a good reputation which eventually helps them achieve their ulterior self-interested motives (Callander 2008; Benabou and Tirole 2006).

There are still substantial knowledge gaps about the respective roles of social-preferences on political selection and politicians' behaviour since the extant literature is not well suited to provide empirical/experimental support to identifying such preferences. It is, however, hard to convincingly isolate one type of politician preferences from another (i.e., self-interested vs social preferences): observed politician behaviour is unlikely to accurately guide research efforts. While empirical studies can successfully document politicians' competence (e.g., education or legislative efforts) (Ferraz and Finan 2011; Dal Bo et al 2017), the empirical study of politician motivation gives rise to tougher identification challenges. In this paper, we use standard survey and incentivised survey to understand self-selected politicians social norms and social preferences in a decentralised democratic setting.

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) includes activities under nine different heads to provide employment to village communities and improve their livelihoods. This scheme is India's largest and best resourced social welfare programme to date (with a budget of 8.91 billion USD in 2010-11), and the world's largest social security intervention in terms of outreach (33 million households in 2013-14). While MGNREGA financing is mostly from the Central Government, implementation is strongly

decentralised. There have been various studies looking into aspects such as its socioeconomic impact, its finances, and its administration and implementation, rural poverty alleviation, gender issues, livelihood and food security, and migration, but there has been little focus on the environmental valuations of the activities that have been carried out so far, except a few that look at environmental impacts of this scheme and mostly they find a positive impact of the scheme on environmental goods and services, such as groundwater recharge, water storage, soil fertility, reclamation of degraded lands and carbon sequestration (e.g., Tiwari et al 2011; Kareemulla et al. 2009; Esteves et al. 2013).

Survey design

Recruitment

For recruitment, we take advantage of India's decentralised and democratic local governance structure, the Panchayat system. This system has three tiers: *Gram Panchayat* (village-level councils), *Panchayat Samiti* (block-level councils), and *Zila Parishad* (district-level councils). A *Gram Panchayat* is divided into *Samsads* (wards). Citizens elect representatives for each tier and elections are held with regular, five-year intervals[4]. Village level elected representatives generally do not have a role in the higher tiers (e,g., block or district level) unless they are the village council head or hold a key position in the political party they belong to. Through the 73rd Constitutional Amendment (1993), village councils were given responsibility for implementation of a variety of government-funded development programs and decisions about investments in local infrastructure such as sanitation, drinking water and

[4] The politicians at the bottom tier of this system (*Samsad* or ward leader) represent around 500-800 voters (around 200-300 households) and are members of a village council or *Gram Panchayat* (GP). GPs usually serve around 3000-5000 voters, although size varies widely. The second tier (i.e., block level) consists of 10-12 GPs and the final tier is the district council (i.e., *Zila Parishad*) which consists of 15-20 (on average) blocks.

roads (Chattopadhay and Duflo 2004). The elected representatives of interest here can thus exercise considerable power in their constituencies.

Our definition of a politician is a person who has either recently fought or recently won an election for a village council (*Gram Panchayat* or GP) seat as a ward member. The politicians at the bottom tier of this system (Samsad or ward leader) represent around 500-800 voters (around 200-300 households) and are members of a village council or Gram Panchayat (GP). GPs usually serve around 3000-5000 voters, although size varies widely. The second tier (i.e., block level) consists of 10-12 GPs and the final tier is the district council (i.e., Zila Parishad) which consists of 15-20 (on average) blocks. Monetary incentives for holding office are limited (e.g. the official salary of the village head is about USD 50/month, ward leaders are paid even less); but there are potential private returns from political rents and corrupt practices. Elected representatives may also enjoy high social status (e.g., Fehr et al. 2013; Jack and Recalde 2015). Village level politicians are likely to have lower opportunity costs of time and are unlikely to be concerned about their reputation (e.g., to influence the probability of winning elections) when facing an unknown audience they have not previously met and are unlikely to meet in the future.

In Odisha Keonjhor district and in Bihar Banka district were selected due to convenience and researchers' prior experience working there. From Keonjhar district the following ICRG blocks were selected randomly for our study: Patna, Saharpada, Ghatagaon, and Telkoi. Also, Anadpur block from Keonjhor district was randomly selected as non-ICRG block. From Banka district, we randomly selected Belhar block as non-ICRG block and the following blocks as ICRG blocks: Fullidumar, Chanan, Bousi, and Dhoraiya. From each selected block, we then chose villages following a random sampling. We then randomly selected our

participants, common villagers and politicians, from a carefully assembled list of politicians who had stood for GP elections during the last ten years and a village census. Our research assistants recruited local enumerators to collect participant information. They prepared a list (census) of households, which was always kept with them only, containing basic demographic information (name of household head, sex, education, occupation). Following a blinded, random protocol, the enumerators selected potential participants and invited them to participate with an invitation letter prepared by the research team.

Results and discussion

Data. Our sample contains 230 respondents from ICRG villages and 214 respondents from non-ICRG villages (and in total, we have 444 observations). Also, 25% and 28% of the respondents are politicians in ICRG and non-ICRG villages. In Table 1, we present the summary statistics of the observable characteristics of the respondents, by gender, educational level, age, caste, elected member and occupation. We note that that 24% and 18% of the respondents in ICRG and non-ICRG villages are female. There is little difference in the age profile and years of education of respondents in ICRG and non-ICRG villages (average years of education are10.1 and 10.23 years in ICRG and non-ICRG villages and average age is 40.38 in ICRG villages and 38.58 in non-ICRG villages). Similar pattern is observed in caste profile except OBC (Other Backward Caste) category—40% in ICRG and 28% in non-ICRG. Eighty three per cent of respondents are agricultural labourers in ICRG villages as compared to 64 per cent of respondents in non-ICRG villages.

Results. We report our main results here.

Standard survey:

In the standard survey, we ask respondents in ICRG and non-ICRG villages to rate some statements from 'strongly disagree' to 'strongly agree' on a qualified scale of four. The first statement states (see Table 2):

> *I believe that the ICRG/NRM[5] works in the village are very important for the well-being of the entire village*

This is to understand whether respondents understand the importance of any work related to climate-change and/or environmental protection—Natural Resource Management (NRM) works in non-ICRG villages and Climate Resilient Work (CRW) works in ICRG villages. In both villages, villagers, politicians, and other officials should be aware of the NRM and CRW works as a detailed discussion is supposed to take place in Gam Sabha meetings. In ICRG villages, a more rigorous awareness programme for general people and specific training for politicians and other officials have been taken place. Such awareness campaign and training should provide better understanding of the importance of such works in ICRG villages. As politicians and other officials receive more training and they are responsible for programme implementation, we hypothesise that elected members will care more about ICRG-related works than politicians in non-ICRG villages. Hence we hypothesise:

> *H_{o1}: Villagers and politicians in ICRG villages care more about NRM/ICRG related works than the villagers and politicians in non-ICRG villages.*

We are unable to reject the hypothesis. On average villagers in ICRG villages are more concerned about climate-related works through MGNREGS—the mean perception of ICRG villagers is 3.90 and the mean perception of villagers in non-ICRG villagers is 3.71 and these means are statistically significant at the 5% level of significance (t-statistic is 3.80, see Table 2). Similar result is observed for politicians—the means are 3.93 and 3.68 for ICRG and non-ICRG villages and they are statistically significant at 5% level (t-stat is 2.68). Figure 1 supports

[5] Refer to the exact ICRG works are taking place/had taken place in the village

this. In Figurer 2 we show perception in ICRG villages is different from non-ICRG villages with the pooled data.

The next statement in the survey goes like:

I am very concerned about environmental issues in my village

This is to understand the general perception of the villagers about the environmental issues, for example, ground water depletion. As argued above, we hypothesize that villagers and politicians in ICRG villages should express more concerns compared to their counterpart due to the effect of climate-awareness programme. We test the following hypothesis:

> *H_{o2}: Villagers and politicians in ICRG villages are more concerned about environmental issues in their villages than the villagers and politicians in non-ICRG villages.*

We are unable to accept the hypothesis. As shown in Figure 4, the overall mean difference of the response in this particular question is not different between ICRG and non-ICRG respondents. There is no significant difference in mean responses between villagers in ICRG and non-ICRG villages and between politicians in ICRG and non-ICRG villages (see Table 2 and Figure 3). The mean perception of ICRG-villagers is 3.20 and the same for non-ICRG villagers is 3.05 and this difference is not statistically different (t-stat is 1.26). For politicians, ICRG-politicians' mean response is 3.22 and non-ICRG politicians' mean response is 3.40 and the difference is not statistically different (t-stat is -0.87).

Next we investigate whether villagers and politicians in ICRG villages believe that they should work more to implement climate-related projects with and/or without monetary compensation. If the awareness and training as part of ICRG interventions help motivate people for environmental protection, we should expect them to contribute more labour to implement climate-related projects (as argued by Besley and Ghatak 2005) compared to those who have not received such awareness. To understand this, we have following the statement in the survey:

I would be willing to work more hours to implement ICRG/NRM works, even without any additional payments

Our hypothesis is:

> *H_{o3}: Villagers and politicians in ICRG villages believe to work more to implement climate-related work, even without monetary payments, than the villagers and politicians in non-ICRG villages.*

Interestingly, we are unable to reject the hypothesis. On average, both villagers and politicians in ICRG villages strongly agree with the statement that they want to work more hours to implement climate-related work without any monetary payments (see Figure 5). Also, on average, this perception in ICRG-villages is significantly different from the non-ICRG villages (see Figure 6). The mean level of agreement among ICRG-villagers is 3.61 whereas the same is 3.15 among non-ICRG villagers and these means are significantly different with a t-statistic of 6.61 (see Table 2). Similarly, ICRG-politicians' average agreement (3.74) is significantly different from non-ICRG politicians (3.22), and t-statistic is 3.91).

We also explore what people, both villagers and politicians, think about the difference and innovation of climate resilient works (CRW) under ICRG interventions compared to standard natural resource management (NRM) works carried out under MGNREGS. The following statement in the survey summarises this.

I do not see any difference between NRM works under MGNREGA and proposed/on-going ICRG/NRM works.

The goal of the ICRG intervention is to provide technical assistance to GP officials so that they could carry out standard NRM works more sustainably. One should expect that people can understand this difference and innovation. We test this using this survey.

> *H_{o4}: Villagers and politicians in ICRG villages believe the works under ICRG are different from NRM works under MGNREGS. Villagers and politicians in non-ICRG villages believe the ongoing NRM works are no different from the proposed NRM works under MGNREGS.*

We find that both villagers and politicians in the ICRG villages are indifferent between the CRWs under ICRG and the NRM works under MGNREGS. The mean response among villagers is 1.81 and mean response among politicians is 1.90 which are very close to indifferent point 2.0 (and they are not statistically different from the indifferent point) (see Table 2 and Figure 7). In contrast, villagers and politicians in non-ICRG villages think that proposed NRM works are not different from ongoing NRM works under MGNREGS, which is not surprising (see Figure 7).

Willingness to Work:

One of the main variables of interest is 'willingness to work' (WTW)—how many hours of free labour (manual work) the respondents are willing to contribute for a hypothetical project implemented by a NGO that would improve water availability in the village. Explaining the costs (manual work by the people) and benefits (e.g. more drinking water in dry season, more water for agriculture and so on) of the project, we ask respondents in ICRG and non-ICRG villages to state whether they are willing to work any hour in between 0 to 12 hours per month or more than 12 hours/month (see Appendix for details). An individual receiving climate awareness and training should understand the relevance of such works better and be more motivated to act for the environment and hence will be willing to work more. We test the following hypothesis.

> *H_{o5}: Villagers and politicians in ICRG villages are willing to work more hours for free to implement a NRM project than the villagers and politicians in non-ICRG villages.*

We cannot reject the hypothesis. Both villagers and politicians in ICRG villages are willing to work more hours than the villagers and politicians in non-ICRG villages. Overall, respondents in ICRG villages are willing to work on average about 13 hours/month whereas non-ICRG-respondents on average are willing work for about 11 hours/month and this

difference is statistically significant (t-statistic is 20.82) (see Table 3). Moreover, around 93% of the ICRG-respondents are willing to work more than 12 hours/month. In contrast, 27% of the respondents from non-ICRG villages are willing work for more than 12 hours/moth. Figure 8 depicts this. Our results from the unconditional summary statistics are confirmed by conditional regression analysis. Following standard OLS (Ordinary Least Square) method, we investigate the effect of ICRG intervention on willingness-to-work (WTW) controlling for different observable characteristics, such as gender, caste, education, age, and occupation. We also consider whether being an ICRG-respondent or not make any significant difference on WTW. Results are presented in Table 4. Using the pooled data from ICRG and non-ICRG villages, results show that ICRG respondents have significant impact on WTW—moving from non-ICRG to ICRG, WTW increases by 1.78 hours/month and this is statistically significant. We also find that female respondents are significantly willing to work more hours than male counterparts. Also, compared to SC and ST respondents, OBC and forward-caste respondents want to work more and these results are statistically significant. We also find that respondents in Odisha are willing work more than respondents in Bihar and this is significant.

In the regression, we also add the perceptions of the respondents (i.e. how they respond in the survey) to understand individual perceptions can help explain respondents' behaviour. We do not find any significant effect of any of the perception variables on WTW except environmental-concern. Those who express that they are very concerned about the environmental issues in the villages, they are willing work less on this project and this result is statistically significant (see Table 4).

We then run separate regressions for ICRG and non-ICRG villages. In non-ICRG villages female, OBC and forward caste respondents are willing to work significantly more than male and SC/ST respondents (see Table 5). Also, education has a significant effect on WTW—more educated people are willing to work more as they understand the relevance and

importance of the work better. Result also shows that non-ICRG respondents in Odisha want to give significantly more free labour for the project than their Bihar counterparts. Also, those who express more concerned about environmental issues in their villages want to work significantly less than others. No other perception variable from the survey has any significant impact on WTW. When we use only ICRG-respondents' data, we do not find any significant effect of state, gender, and education on WTW (see Table 6). This is striking as the significant positive impact of ICRG on WTW in the pooled data is not conditional on other observable characteristics in the ICRG villages. The state, caste, and gender effect and the effect of environmental concern on WTW in the pooled data are attributed by non-ICRG respondents. This result suggests that ICRG intervention has helped motivate common villagers and politicians to act on climate protection and they are happy to contribute to climate-related projects by giving free labour.

Moreover, in contrast to the respondents in non-ICRG villages, respondents in ICRG villages are willing to work more hours, even without any monetary remuneration, to implement climate-related projects. Further, we run a probit regression to investigate whether the probability of WTW for more than 12 hours/month can be explained by ICRG intervention. Results show that the probability of working for more than 12 hours/month significantly increases is a respondent is form ICRG village than non-ICRG village (see Table 7). These suggest that ICRG intervention, in particular the awareness campaigns, help influence people's perception about adaptive actions to cope up with climate change.

Concluding remarks

Understanding individuals', especially politicians', social preferences is important for environmental policy since a more incisive understanding of people's motivation can aid the

design of environmental policies and institutions that monitor and incentivize politicians and general people more effectively. We investigate the relationships of social norms related to taking more natural resource related to work under MGNREGA and whether awareness campaign through ICRG intervention has any impact on influencing such norm. Successful implementation of MGNREGA depends crucially on the climate-awareness of local politicians and common citizens in the decentralised participatory governance structure. Based on standard survey and incentivised survey conducted in ICRG and non-ICRG villages in Bihar and Odisha we find that: (1) respondents in ICRG villages believe that more NRM/ICRG-related work should be undertaken due to climate change which is significantly different from what respondents from non-ICRG villages believe; (2) both common villagers and politicians in ICRG villages are willing to provide significantly more free labour than non-ICRG villages for implementing climate-related projects.

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Table 1. Summary of Sample demography

Category	**ICRG Mean**	**Non-ICRG mean**	**Combined Mean**
Female	0.23 (0.42)	0.17 (0.38)	0.20 (0.40)
Froward Caste	0.10 (0.30)	0.14 (0.35)	0.12 (0.32)
SC (Scheduled Caste)	0.14 (0.34)	0.21 (0.40)	0.17 (0.37)
ST (Scheduled Tribe)	0.36 (0.48)	0.37 (0.48)	0.37 (0.48)
OBC (Other Backward Caste)	0.40 (0.49)	0.28 (0.45)	0.34 (0.47)
Education	10.1 (3.83)	10.23 (4.01)	10.16 (3.92)
Farmer (in %)	83%	64%	74%
Age	40.38 (8.67)	38.58 (10.02)	39.51 (9.38)
Elected member	25%	28%	27%230
Observation	230	214	444

Table 2.

		Common citizens			Politicians		
Q#	Questions	ICRG Mean (s.d).	Non-ICRG Mean (s.d.)	t-test (p-value)	ICRG Mean (s.d).	Non-ICRG Mean (s.d.)	t-test (p-value)
Q1	*I believe that the ICRG/NRM[6] works in the village are very important for the well-being of the entire village*	3.90 (0.02)	3.71 (0.42)	3.80 (0.00)	3.93 (0.02)	3.68 (0.09)	2.68 (0.00)
Q2	*I am very concerned about environmental issues in my village*	3.20 (0.08)	3.05 (0.09)	1.26 (0.20)	3.22 (0.15)	3.40 (0.13)	-0.87 (0.38)
Q3	*I would be willing to work more hours to implement ICRG/NRM works, even without any additional payments*	3.61 (0.03)	3.15 (0.05)	6.61 (0.00)	3.74 (0.05)	3.22 (0.13)	3.91 (0.00)
Q4	*I do not see any difference between NRM works under MGNREGA and proposed/on-going ICRG/NRM works*	1.81 (0.09)	2.7 (0.08)	-6.93 (0.00)	1.90 (0.14)	3.00 (0.13)	-5.31 (0.00)

[6] Refer to the exact ICRG works are taking place/had taken place in the village

Table 3. Willingness to work (WTW)

	Common citizens			Politician			Pooled		
	ICRG Mean (s.d).	Non-ICRG Mean (s.d.)	t-test (p-value)	ICRG Mean (s.d).	Non-ICRG Mean (s.d.)	t-test (p-value)	ICRG Mean (s.d).	Non-ICRG Mean (s.d.)	t-test (p-value)
WTW	12.84 (0.04)	10.91 (0.10)	16.96 (0.00)	12.95 (0.04	10.85 (0.18)	12.22 (0.00)	12.87 (0.03)	10.90 (0.09)	20.82 (0.00)

Table 4: Regression results of WTW using pooled data

Variable	Coefficient estimate	Std. error	t-stat	p-value
ICRG	1.78*	0.14	12.39	0.00
Female	0.24*	0.12	1.91	0.05
Env_concern	-0.20*	0.05	-3.82	0.00
Occupation	-0.03	0.02	-1.54	0.12
Caste 3 (OBC)	0.29*	0.13	2.12	0.03
Caste 4 (Fwd Caste)	0.73*	0.17	4.09	0.00
State (Odisha compared to Bihar)	0.24*	0.11	2.04	0.04
Age	-0.002	0.005	-0.50	0.61
Education	0.01	0.01	1.44	0.15
Politician	0.04	0.11	0.38	0.70
WTW with N Money	-0.03	0.07	-0.41	0.68
Constant	10.97*	0.57	19.17	0.00

Adj. R^2=0.52; Number of observation = 444; Estimator: OLS.

Table 5: Regression results of WTW using data from Non-ICRG villages

Variable	Coefficient estimate	Std. error	t-stat	p-value
Female	0.47*	0.25	1.89	0.06
Env_concern	-0.25*	0.11	-2.33	0.02
Occupation	-0.01	0.03	-0.47	0.63
Caste 3 (OBC)	0.37*	0.24	2.41	0.01
Caste 4 (Fwd Caste)	1.28*	0.31	4.09	0.00
State (Odisha compared to Bihar)	0.43*	0.25	1.69	0.09
Age	-0.009	0.009	-0.96	0.33
Education	0.05*	0.02	2.57	0.01
WTW with N Money	-0.04	0.12	-0.34	0.73
Constant	11.36*	1.16	9.78	0.00

Adj. R^2=0.13; Number of observation = 214; Estimator: OLS.

Table 6: Regression results of WTW using data from ICRG villages

Variable	Coefficient estimate	Std. error	t-stat	p-value
Female	-0.02	0.09	-0.26	0.79
Env_concern	-0.04	0.4	-1.02	0.30
Occupation	-0.09	0.03	-2.38	0.01
Caste 2 (SC)	-0.204	0.11	-1.74	0.08
Caste 3 (OBC)	-0.002	0.10	-0.02	0.98
Caste 4 (Fwd Caste)	0.02	0.14	0.18	0.85
State (Odisha compared to Bihar)	0.08	0.13	0.61	0.54
Age	-0.00	0.004	-0.11	0.91
Education	-0.01	0.01	-0.97	0.33
WTW with No Money	0.06	0.07	0.84	0.40
Constant	13.47*	0.63	21.28	0.00

Adj. R^2=0.02; Number of observation = 230; Estimator: OLS.

Table 7. Probit regression of 'WTW more than 12 hours'

Variable	Coefficient estimate	Std. error	t-stat	p-value
ICRG	2.12*	0.16	12.88	0.00
Female	0.25	0.21	1.19	0.23
Occupation (Farmer)	0.27	0.18	1.51	0.13
Caste 2 (SC)	0.21	0.22	0.97	0.33
Caste 3 (OBC)	0.39	0.22	1.71	0.08
Caste 4 (Fwd Caste)	0.70*	0.28	2.50	0.01
Age	-0.01	0.008	-1.48	0.13
Education	-0.01	0. .02	-0.74	0.45
Constant	-0.50	0.46	-1.08	0.27

Pseudo R^2=0.41; Number of obs = 444

Figure 1:

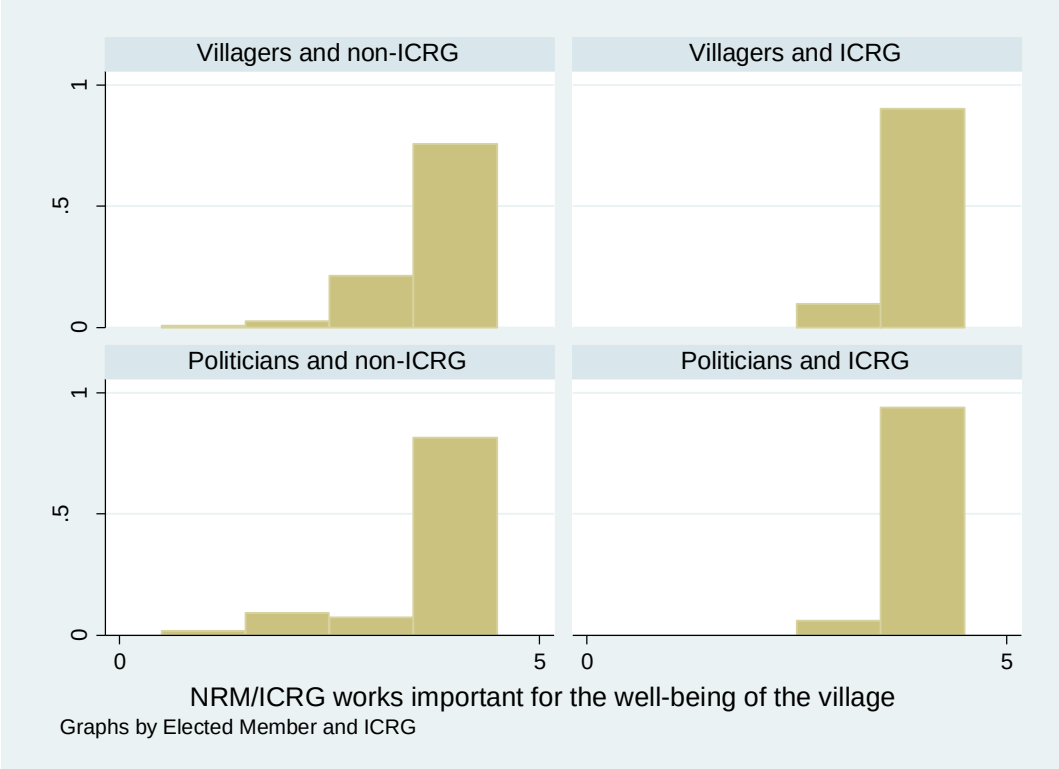


Figure 2

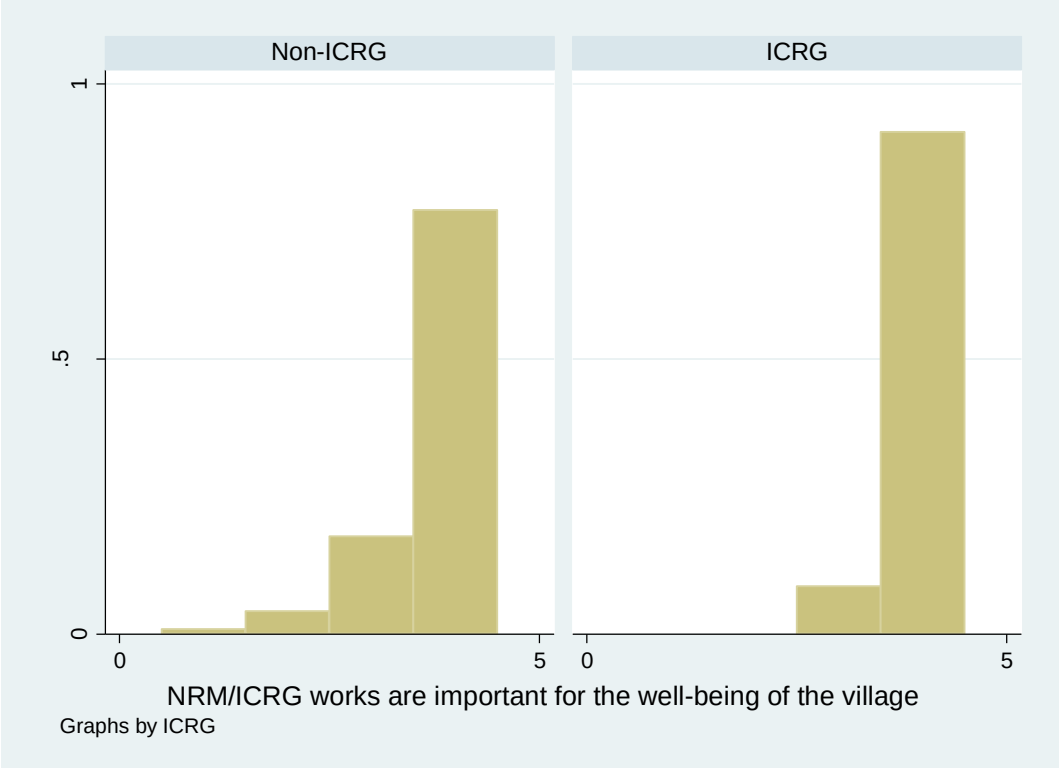


Figure 3

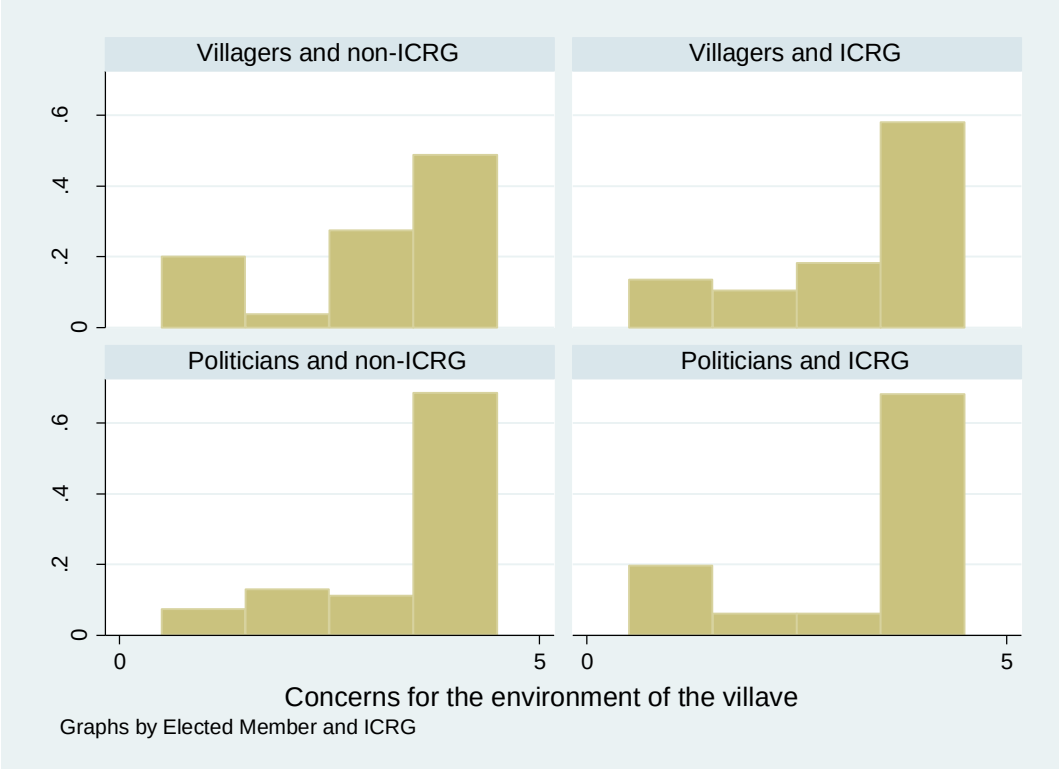


Figure 4

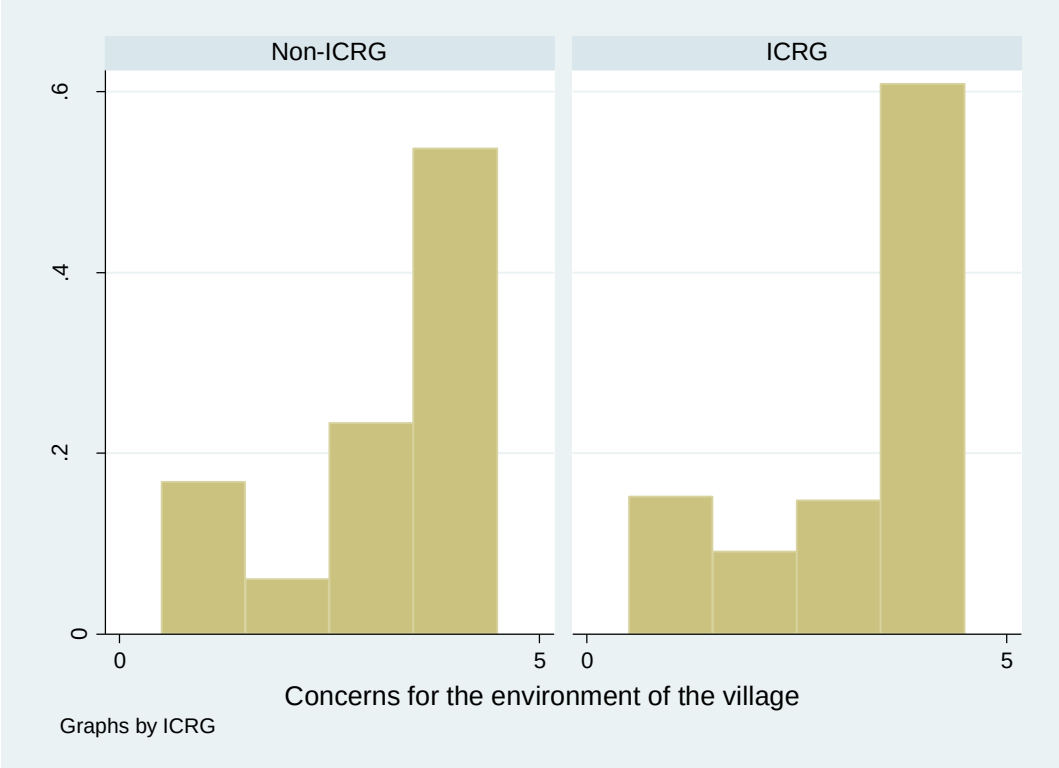


Figure 5

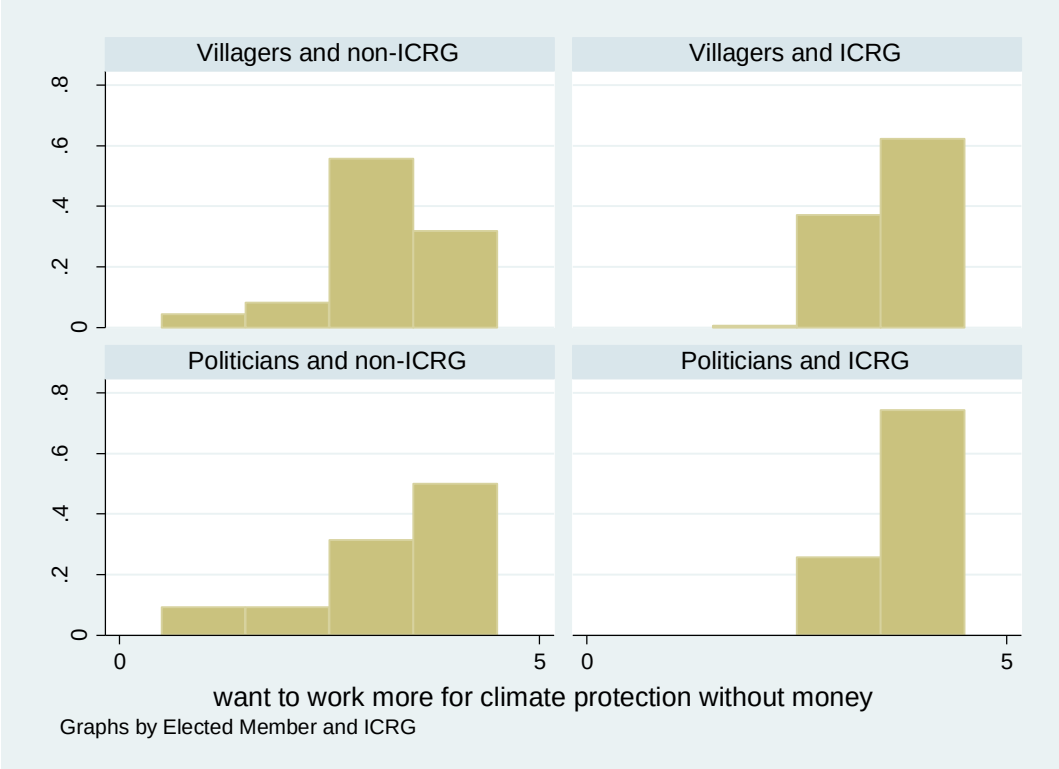


Figure 6

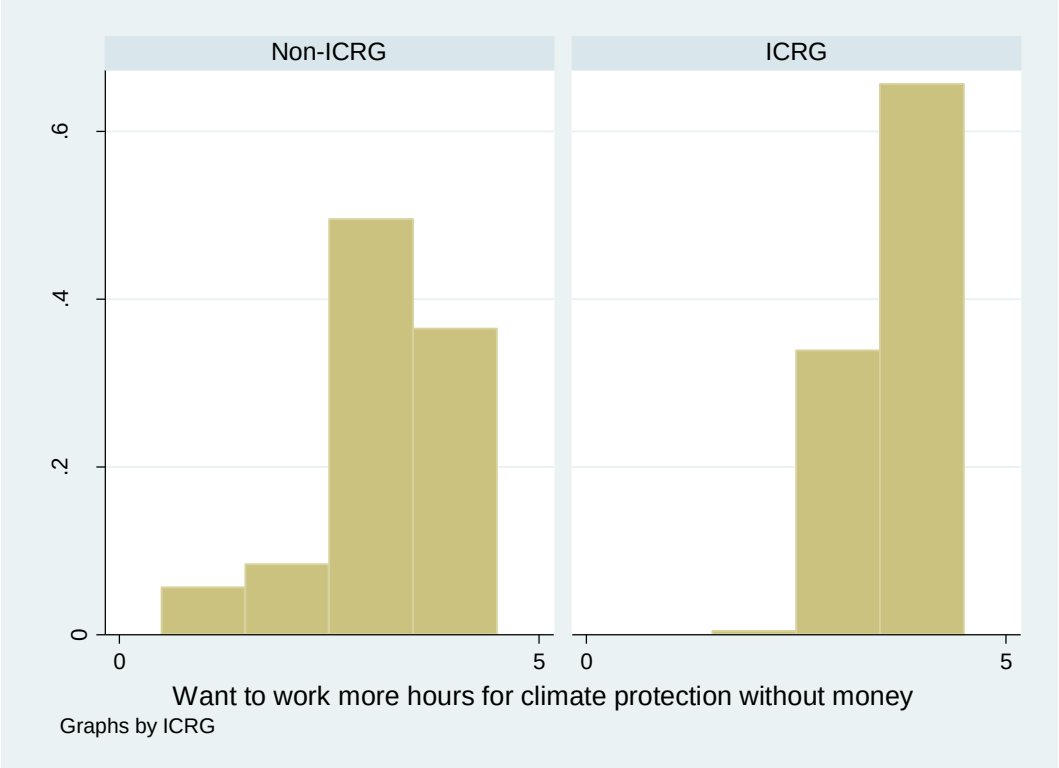


Figure 7

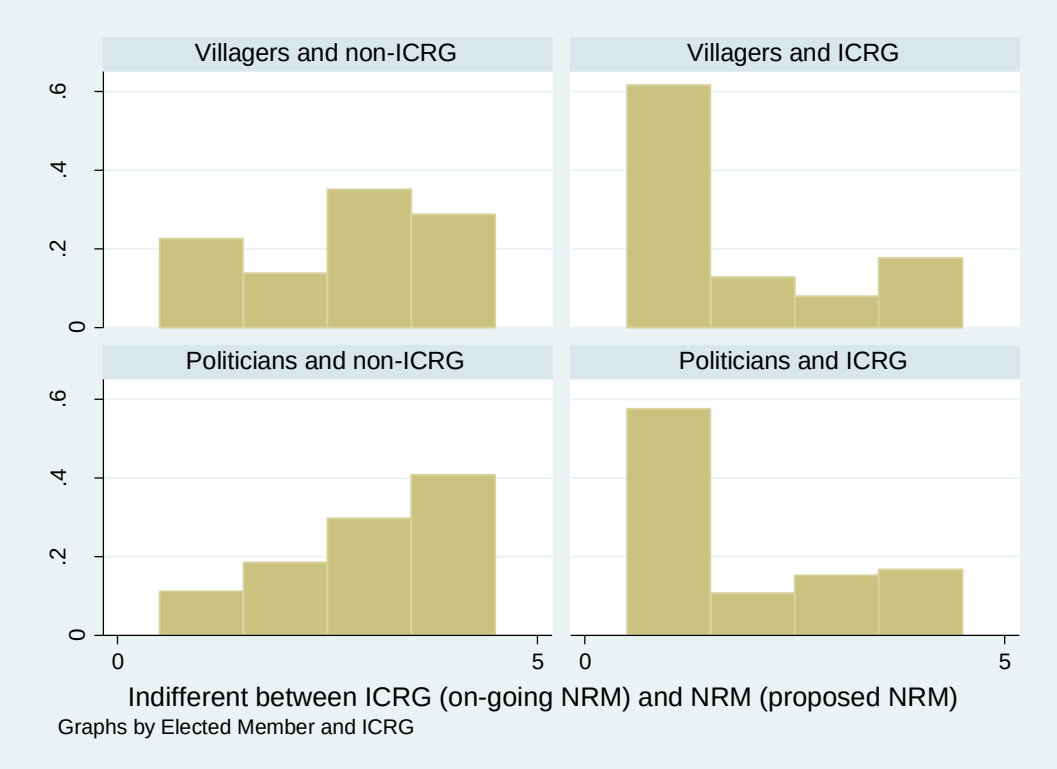
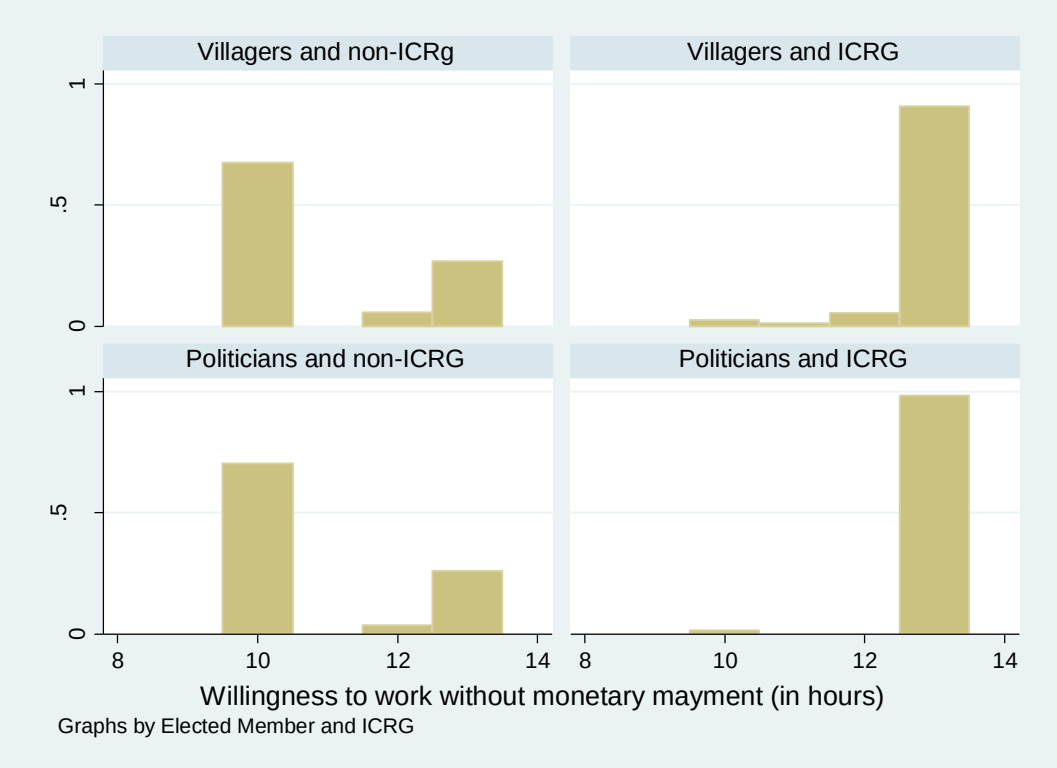


Figure 8



Appendix

Questionnaire

Section A

General questions to be completed by the investigator (for a village)

1. Name of investigator:_____
2. Block: _____
3. Village:_____
4. ICRG/Non-ICRG:_____

5	What type of NREGA work has been carried out in this village in the last 3 years?	Road construction (1); Other Rural Infrastructure (2); Land development (3); Ponds (4); Canals (5); Other Water Harvesting Structures (6); Plantations (7) Others (8) (**Please specify**) _____
6	What type of ICRG work has been implemented in this village?	Core Work: ……. Integrated Work…….. (**Please specify**)
7	Is it completed?	Completed (1); On-going (2); and Some completed, some on-going (3)
8	ICRG Training for Technical Assistants/GP Members/Other Official	Yes: No:
9	What kind of ICRG training (materials covered, duration etc.) has been provided to technical assistants?	Specify:_____ _____
10	ICRG awareness programs	Yes:_____; No:_____
11	What kind of ICRG awareness programs (materials covered, number of people targeted etc.) have been provided to villagers?	Specify:_____ _____

Section B

General information to be completed by the respondents

By proceeding with the survey you are confirming that you: (1) have read or been informed about the content of the Participation Information Sheet and have had the opportunity to consider the information and ask questions; (2) understand that your participation in the study is voluntary and that you are free to withdraw at any time without giving a reason; (3) agree that the collected information may be used in an anonymous form to support other research in the future.

1. Male (___) Female (___)
2. Age:
3. Household main occupation:
4. What is your main occupation, if any:
5. What jati (i.e., caste) do you belong to? _____
6. Religion: Hindu (____) Muslim (____) Other (____)
7. How many years of education have you completed? _____ years
8. Have you heard of Climate Change? Yes No
9. Have you heard of ICRG? Yes No. If Yes,
10. Have you attended any ICRG training session? Yes (How many sessions ___) No
11. How many Gram Sabhas did you attend in last 3 years?_____
12. Are you involved in planning and/or implementing ICRG works? Yes No
13. If Yes, what's your role? _____
14. Are you presently an elected representative in your Gram Panchayat? YES NO
    a. If yes, in what position? _____
    b. If yes, is this a reserved seat? YES NO If, YES, which reservation category_____

Section C

Please rate to what extent you agree/disagree with the following statements, according to the scale below:

Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
1	2	3	4

1	I believe that the ICRG[7] works in the village are very important for the well-being of the entire village	1 2 3 4
2	I am very concerned about environmental issues in my village	1 2 3 4
3	I would be willing to work more hours to implement ICRG works, even without any additional payments	1 2 3 4
4	I do not see any difference between NRM works under MGNREGA and proposed/on-going ICRG works	1 2 3 4
5	Panchayats play a crucial role in protecting the environment	1 2 3 4
6	Due to the effects of climate change, it is very important to undertake more ICRG work than before	1 2 3 4
7	General people in my village do not understand the effects of climate change	1 2 3 4
8	The ICRG works are/will be too difficult to execute	1 2 3 4

9. Please mention the following to each respondent:

In the following, you should imagine that: An engineer working for an international NGO has designed a project that can improve the availability of water in your village. The project will not involve any material costs but it will require manual work. The NGO is willing to provide the technical assistance needed to implement the project but only if there are enough people in your village who are willing to volunteer to do the manual labour. The work will not be paid. There is no government scheme to cover this type of project or this type of work. The work can be carried out by both men and women. The work can be carried out by adults (18+ years) only.

The project can impact you in the following ways: (1) more water will be available for your household's main drinking water source during dry season; (2) improved ground water level; and (3) more water availability for agriculture. If you choose to implement the project, then you will have to contribute unpaid manual labour but in return you will get some or all of the improvements mentioned above.

Although you do not actually work the amount of hours you will indicate in the question below, indicating your willingness to work more in implementing such a project will increase the chance that government will implement the project. Consequently, you may in fact work more hours with no extra payments in general. Therefore, please answer the survey questions carefully.

Then ask the following:

[7] Refer to the exact ICRG works are taking place/had taken place in the village

How much extra hour per month you would be willing to work to implement ICRG works in your village?

Hour per month increase
0
1
2
3
4
5
7.5
10
12
>12