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Policy innovations for pro-poor climate support: social protection, small-scale infrastructure, and active citizenship under India's MGNREGA

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ABSTRACT

While extensive scholarship has explored principles for pro-poor climate support, there is a need for knowledge of specific strategies that can achieve these objectives on the ground. This paper examines India's Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and its effects on climate risk reduction. Although the MGNREGA was not designed specifically as a climate programme, it incorporates three key elements with the potential to advance pro-poor climate assistance objectives: (a) social protection through the provision of minimum wage labour; (b) the development of small-scale, natural resource-focused infrastructure; and (c) a decentralized, 'community-based' planning architecture. Analysis of a primary dataset comprising 1400 households and 798 projects in India's state Himachal Pradesh, interpreted through intensive qualitative fieldwork, shows that both projects and labour have helped vulnerable households confront climate and other risks, while the Act's decentralized architecture has expanded the channels for citizens to claim support for local challenges. The paper argues for the importance of building a broader 'ecosystem' of support to target diverse local needs, and of the need to strengthen the political architectures through which vulnerable groups access these benefits on the ground – especially in the context of decentralized approaches for climate assistance.

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Climate adaptation; social protection; community-based adaptation; vulnerability; sustainable development; MGNREGA; India

1. Introduction

Assisting the rural poor confront the challenges of climate change is a central priority of development policy in the present era. To date, extensive scholarship has explored principles to support the development of pro-poor climate assistance (Colloff et al., 2017; Eriksen et al., 2011; Füssel, 2007; Mertz, Halsnæs, Olesen, & Rasmussen, 2009; Ribot, 2014), while there is growing evidence of adaptive responses that have emerged in various planning contexts (Adger, Huq, Brown, Conway, & Hulme, 2003; Agarwal, 2010; Burnham & Ma, 2018; Totin et al., 2018). Nevertheless, there remains a need for actionable policy strategies that can ensure assistance for vulnerable groups at a broader scale, both by 'mainstreaming' new kinds of climate support into existing development practice as well as the creation of novel approaches to confront emerging threats (Ayers, Huq, Faisal, & Hussain, 2014; Lemos, Boyd, Tompkins, Osbahr, & Liverman, 2007).

This paper explores the implementation of India's landmark Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and its effects on climate risk reduction, with evidence from India's northern state of Himachal Pradesh. Elsewhere described as the largest poverty reduction scheme in the world (Jenkins & Manor, 2017), the MGNREGA was not specifically designed as a climate assistant programme. However, it incorporates several key policy strategies that have been viewed as having important potential to provide support for vulnerable rural populations in the context of climate change. First, the MGNREGA is one of the world's foremost attempts to establish a foundation for social protection – in this case by extending a legal guarantee of 100 days minimum wage labour per year for all rural households in India – a strategy that can play an important role in helping vulnerable groups to confront climate and other challenges (Béné, 2011; Davies, Guenther, Leavy, Mitchell, & Tanner, 2009; Johnson, Bansha Dulal, Prowse, Krishnamurthy, & Mitchell, 2013). Second, this labour is used to support small-scale local infrastructure development, including project types that have the potential to reduce exposure to various kinds of climate risk and threats (Biagini, Bierbaum, Stults, Dobardzic, & McNeeley, 2014; Burney, Naylor, & Postel, 2013; Rawlani & Sovacool, 2011). Third and finally, the Act is built on a decentralized architecture that gives village councils (in India known as *panchayats*) central authority to oversee its implementation, which aligns with a growing focus on community-based strategies for climate adaptation – an approach that proponents argue can help to bring about more effective, responsive, and locally-tailored climate support (Dodman & Mitlin, 2013; Forsyth, 2013; Kirkby, Williams, & Huq, 2018). Yet despite broad recognition of the MGNREGA's potential for helping to support vulnerable rural populations confront climate change (Dhanapal, 2014; Esteves, Rao, Sinha, & Roy, 2013), there have been relatively

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few studies that explore its multiple roles in providing climate support simultaneously (Adam, 2015; Godfrey-Wood & Flower, 2018), and none that examine empirically the local governance conditions that improve its ability to do so effectively.

Given the multifaceted nature of climate threats, recent scholarship on adaptive social protection has sought to move beyond the identification of specific policy priorities to explore how multiple interventions and state support systems work together to target different aspects of vulnerability (Arnall et al., 2010; Davies et al., 2013; see also Lemos, Lo, Nelson, Eakin, & Bedran-Martins, 2016). The claim of this paper is that by bundling these three key policy strategies together – social protection, small-scale infrastructure development, and a community-based architecture – the MGNREGA does just that, within a governance arrangement that has the potential to make state support more accessible and responsive to local needs. The paper's objective is to explore how the Act's different dimensions work together to target multiple aspects of rural livelihood security, while also examining some of the local governance conditions associated with more effective implementation on the ground. It does so by analyzing a large primary dataset comprising 1400 households and 798 small-scale development projects in 35 local governmental units (*panchayats*) in the Kangra District of Himachal Pradesh.

The analysis shows that local development projects are helping households to address several key climate-related stressors, while labour provides additional opportunities to strengthen rural livelihoods more generally – both as a regular income generating strategy and as a fallback option in times of stress. A strong association between labour and project benefits suggests that these two benefits have synergistic effects by targeting different aspects of household livelihood security. Finally, analysis of socio-economic and local political factors associated with labour and project benefits shows that more socially-marginalized, resource dependent populations benefit more from both kinds of assistance, while highlighting some of the ways that the Act's decentralized architecture has opened up new opportunities for citizens to access and influence the support systems that they rely upon.

The analysis has important implications for the development of future climate support. It underscores the need to develop strategies that target different local needs simultaneously, while also revealing potential synergies that can emerge by bundling different forms of support together. The findings also highlight the need to move beyond specific policy frameworks to focus on the broader political and institutional architectures through which they are carried out on the ground – particularly in the context of decentralized and community-based planning approaches.

2. Background and literature

As climate change has gained prominence in discussions on rural development, governments around the world have taken steps to 'mainstream' climate related-concerns into a variety of state functions. Although the MGNREGA is not specifically focused on climate change *per se*, scholars and policy makers have long recognized its potential to help vulnerable groups respond to the challenges of climate change (Adam, 2015; Dhanapal, 2014; Esteves et al., 2013; Godfrey-Wood & Flower, 2018). Indeed, the very scale of support – with over 52 million households receiving employment and almost 9 million small-scale development projects completed for the 2018–19 fiscal year alone – arguably makes it one of the most significant policies for climate support in the world today. Three key features of the Act are notable.

First, the Act gives a legal guarantee of 100 days minimum wage labour per year to all rural households. In so doing, it joins a growing range of 'social protection' mechanisms around the world – cash transfers, child benefits, government funded pensions, and public work programmes – that aim ensure access to basic needs and income to vulnerable groups (Barrientos & Hulme, 2009; Devereux, McGregor, & Sabates-Wheeler, 2011; Fiszbein, Kanbur, & Yemtsov, 2014). In the context of climate change, social protection mechanisms have been viewed as a key form of public assistance that can help to safeguard basic needs in times of distress as well as provide new income streams that can expand the range of household response options (Béné, 2011; Davies et al., 2009; Johnson et al., 2013; Lemos et al., 2016). In fact, the roots of the MGNREGA itself lie within decades' old social policies designed to help prevent economic dislocation in the context of drought (Drèze & Sen, 1989). Recent work on 'adaptive social protection', in turn, has sought to expand the ways that such approaches are pursued, arguing that closer integration with a range of other adaptation and disaster risk reduction strategies has the potential to produce more transformative vulnerability reduction (Arnall et al., 2010; Davies et al., 2013).

Second, the labour provided under the Act is used to undertake small-scale development projects in and around labourers' own villages. It thus aligns with a second key emphasis in discussions on local adaptation planning: the development of small-scale infrastructure to reduce exposure to climate risk and threats. While it is clear that many adaptation efforts must be coordinated at higher scales, there is a growing recognition that many small-scale interventions can provide important, locally-relevant, and often cost-effective means to confront certain kinds of climate risks; micro-irrigation projects, check dams, water recharge pits, retention walls, drainage canals, wells, and other small-scale interventions can help to mitigate exposure to local climate threats and in some cases make livelihood more prosperous and secure more generally (Biagini et al., 2014; Burney et al., 2013; Laube, Schraven, & Awo, 2012; Pretty et al., 2006). The MGNREGA is one of the largest streams of funding for small-scale development projects in India today, which is being channelled into a wide range of natural resource and livelihood-focused interventions (Esteves et al., 2013; Godfrey-Wood & Flower, 2018).

Finally, the MGNREGA is built on a decentralized architecture that gives significant authority to village-level governments to oversee its implementation – including both the provision of labour and the selection of development projects. As such, the MGNREGA joins a broader trend toward the decentralization of various state functions to local institutions over the past several decades (Faguet, 2014; Manor, 1999; Speer, 2012). In the context of climate planning, such ideas have supported a growing emphasis on 'community-based adaptation', which is premised on the belief that the incorporation of local knowledge,

skills, and lived experiences of climate threats can help to support more effective and context-appropriate climate interventions (Forsyth, 2013; Kirkby et al., 2018; McNamara & Buggy, 2017; Wright et al., 2014). By granting elected village councils central authority to oversee it implementation, the MGNREGA has the potential to produce new channels for citizens to claim access to key benefits and to influence planning processes for climate responses.

Yet while the core features of the Act have significant potential to help advance pro-poor climate support, outcomes have been highly variable in practice (Sukhtankar, 2016). As is now extensively documented, administrative irregularities, delayed payments, petty corruption, and variable work quality have often compromised the benefits the Act was expected to provide; most significantly, the legal 'right' to employment has been hard to enforce in practice, and labourers often do not receive the full extent of labour they demand (Chopra, 2014; Narayanan, Das, Liu, & Barrett, 2017). Nonetheless, evidence shows that the Act has brought about important positive effects, including rising rural wages and bargaining power (Carswell & De Neve, 2014; Drèze & Sen, 2013; Jakimow, 2014), gains in human well-being such as improved food access and nutrition (Deininger & Liu, 2019; Nair et al., 2013; Ravi & Engler, 2015), reduced stress migration (Das, 2015), and reduced climate risk exposure (Esteves et al., 2013). The central role of local governments in overseeing labour and project implementation also appears to have galvanized more dynamic participation in local politics in some contexts (Fischer & Ali, 2019; Kruks-Wisner, 2018).

The present paper adds to this work by providing an empirical analysis of how the Act has been implemented and its contributions to climate risk reduction in the Kangra District of Himachal Pradesh – a state with comparative success in implementing a range of government schemes (Drèze & Sen, 2013; Khera, 2011). As such, the analysis provides evidence of the kinds of outcomes that are possible in relatively favourable conditions: where there is strong commitment from the state government to implementing the Act effectively and a well-established system of local governments already in place to oversee its implementation.

3. Study area and background

3.1. Data collection and methods

This study is based upon a large data collection effort of 1400 households in 35 villages within the Kangra District of Himachal Pradesh. Surveys were conducted in 2013 in the Baijnath and Lambagaon Blocks in the eastern part of the district, which comprise a wide variety of environmental conditions in the area. While the Baijnath Block is located at higher reaches of the valley and receives more rainfall overall, Lambagaon is lower and drier, with more acute water stress in the pre-monsoon months. The two blocks are demographically similar: Baijnath has a population of 91,571 (approx. 24% *scheduled caste* – i.e. low caste – a 73% literacy rate, and 25.5% below the poverty line), while Lambagaon has a population of 74,272 (30% *scheduled caste*, 76% literacy rate, and 25% below the poverty line) (as reported by the Census of India, 2011).[1] Within each block, villages were chosen purposefully to vary on key demographic characteristics (including village size, caste, and ethnic composition), with 40 households randomly selected within each. Surveys were undertaken between July 2013 and May 2014 by a team of research assistants.

The panchayat-level survey captured key dimensions of village demographics, local politics, and electoral history. The household-level survey gathered information on household demographics, livelihoods, dimensions of political participation, access to MGNREGA labour, and impacts of projects built under the Act. In total, the data captures details of 798 MGNREGA projects, which is the total number of distinct projects that the data collection team was able to identify in the study villages implemented until 2012 (the year before data collection). The project survey, in turn, gathered more extensive details about each project, which was filled out using focus group discussions of people living in and around projects; enumerators were trained to include individuals from different social backgrounds in discussions in order to reflect the heterogeneity of beneficiaries in different areas of the village. Perceived positive and negative impacts were later coded into broad impact types to enable comparison across the larger sample.

Findings from the survey have been interpreted and contextualized through knowledge gained from intensive qualitative fieldwork spanning nearly a decade working in the area, including annual field visits and longer periods living in the district (6 and 9 months) in 2012 and 2016. During this time, the author has visited dozens of villages and conducted open-ended interviews with several hundred individuals from diverse social backgrounds, including MGNREGA labourers, local elected leaders, and a broad cross-section of citizens more generally. The author has also undertaken extensive participant observation, including attending village meetings, working as a labourer on the MGNREGA jobsite, accompanying local leaders as they select and design MGNREGA projects, and following low-level technical staff through their visits to oversee the Act's implementation. These experiences have provided a detailed view of the processes through which the MGNREGA has been implemented, which has offered important insights for the interpretation of broader trends observed in the quantitative analysis.

3.2. The development context in Himachal Pradesh

While Himachal Pradesh was considered among the most underdeveloped regions of India at the time of independence, today it ranks at or near the top of Indian states for a variety of indicators relating to health, education, nutrition, and other dimensions of human well-being. Various factors have likely played a role in facilitating these gains. As Drèze and Sen (2002) have argued, the relative empowerment of women in society (at least compared to other parts of India), existing traditions of collective action for resource management, and a well-disciplined bureaucracy have all paved the way for relatively effective implementation of state programmes. Chhatre and Saberwal (2006) argue that robust histories of political mobilization rooted in struggles for land reforms, a well-developed civil society, and strong multi-party competition over the past three decades have helped to bring about more vibrant

citizen engagement in public affairs, thus making state support systems more responsive as a whole. More recently, the strengthening of local elected institutions (*panchayats*) and affirmative action policies that reserve seats for marginal groups within them have led to a greater presence of less powerful groups in local governance processes (Fischer, 2016).

3.3. Livelihoods and climate risk in the Kangra District

The Kangra District is a fertile agricultural terrain in the lower-middle Himalayas, beneath the towering Dhauladhar mountain range (Figure 1). Livelihoods are centred primarily on agriculture and livestock husbandry; the past two decades have seen growing off-farm employment in regional towns and lowland cities. Dominant crops include rice and maize in the summer and wheat in the winter as well as some scattered cash crop production. The district receives substantial rain during the monsoon season, yet water stress is often significant in the premonsoon months, during which summer crops (especially rice and maize) are planted. Monsoon cloudbursts often cause flooding and, not infrequently, landslides. Extreme weather events, such as hail and windstorms, can cause significant agricultural damage at other times during the year. There is an acute perception of climate risk and change among area residents, an issue which is often raised by farmers when discussing agriculture in the region.

Climate risk and stress has been experienced in different ways across the study area. Particularly in the higher reaches of the valley, many farmers report an increasing incidence of extreme weather events such as unseasonable hail storms, which has led to crop losses and for some farmers increasing debt. Throughout the district, the biggest challenge that most households face is water stress. Rainfall is highly variable between years – particularly in the May and June sowing season (Figure 2). Many farmers report increasing unpredictability in the onset of the monsoon, thus making it difficult to identify the best timing for planting of crops. Before the monsoon – when rice and maize is planted throughout much of the valley – water shortages are common. In the upper reaches of the valley, abundant glacial streams mean that water stress is less severe overall; yet here, too, domestic water taps still often run dry during the peak of summer while a lack of rainfall can result in crop losses thereafter. In lower parts of the district, water scarcity has led many farmers to abandon wet rice cultivation for other agricultural practices (including maize and dry-rice cultivation); some have simply chosen to leave agriculture altogether.

Inevitably, these stressors are felt unevenly across different segments of society. For the upwardly mobile, many of whom have moved toward off-farm employment, these challenges are often of relatively little significance. But for those who continue to rely heavily on subsistence agriculture, especially the poor and women-headed households, effects are acute. For such households, climate threats are also often experienced in tandem with a broader set of stressors that households face, such as illness, death, and the everyday experience of poverty more generally.

3.4. Decentralization and the MGNREGA

India's 73rd Constitutional Amendment (1992) established local elected governments in their present form, built upon a three-tiered architecture with elected units at several scales (Manor, 2010). The lowest tier – known as the *gram panchayat* (henceforth simply *panchayat*) – is the one that oversees most local governance functions. The panchayat is comprised of several elected positions including the president (*pradhan*), vice-president (*up-pradhan*), and five hamlet-level representatives (*ward member*). All seats have *reservations*, an affirmative action policy that reserves, rotationally, a proportion of all elected positions for women (presently 1/2 of all seats in Himachal Pradesh) as well as for low castes and minority ethnic groups based on their population.

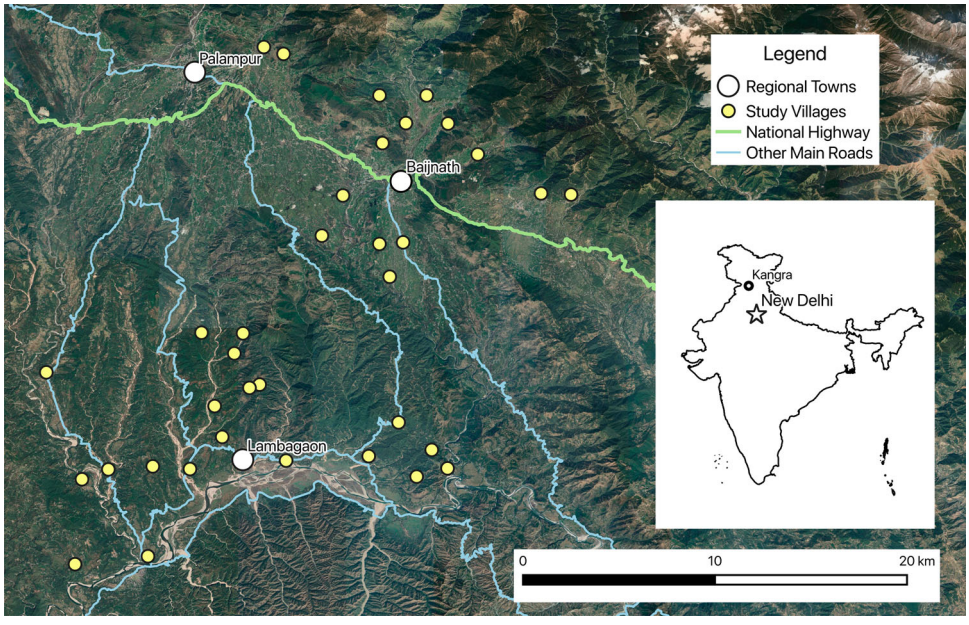

Figure 1. Map of the study area (base map from Google Earth; imagery from Google, Maxar Technologies, CNES/Airbus).

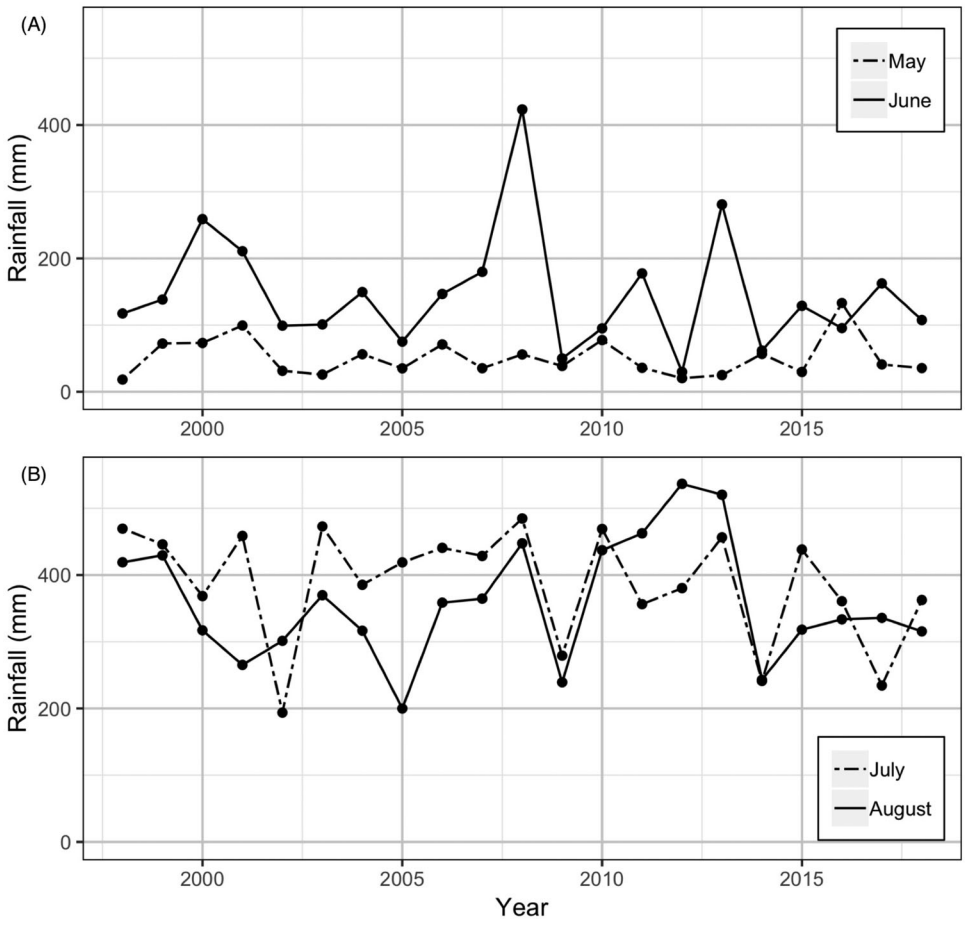

Figure 2. Precipitation trends, (A) pre-monsoon and (B) monsoon months (source NASA TRMM_3B43 dataset, 2011).

While the resources given to panchayats were initially limited, the importance of panchayats increased greatly with the introduction of the MGNREGA. Passed in 2005 (phased into the Kangra District in 2007), the MGNREGA gives a significant role to panchayats to oversee its implementation, including identifying projects to be implemented under the Act. Discretion is not boundless; chosen projects must align with a list of priority works as defined by the Act's Schedule A, however this still includes a variety of projects with the potential to bring local benefits. While the actual scope of local discretion varies greatly across India, in Himachal Pradesh elected leaders have significant control in developing a list of priority works and often offering significant input into their design (Fischer & Ali, 2019). Low level technical staff of the development bureaucracy work with panchayat leaders to develop project designs. As the case material below illustrates, a large proportion of projects are of relevance for addressing climate risk and threats; many also have potential to help to build more secure livelihoods more generally.

4. Analysis and findings

4.1. Small-scale development projects

The paper's primary data identifies 798 distinct projects undertaken within the 35 study panchayats between 2007 and 2012. The coverage of project benefits is notable; 90% of households in the survey have benefitted from at least one project; almost 2/3rds say that they have benefitted from 2 or more.

Based on the survey data, the analysis categorized projects into distinct types to enable better comparison between them (Figure 3). The largest category focuses on different aspects of rural connectivity, such as small roads, concrete village paths, and small bridges. These projects may serve a variety of functions, often not directly related to climate. Still, qualitative responses within the survey data indicate that many such connectivity projects were undertaken specifically to enhance accessibility of more remote areas during the monsoon, when

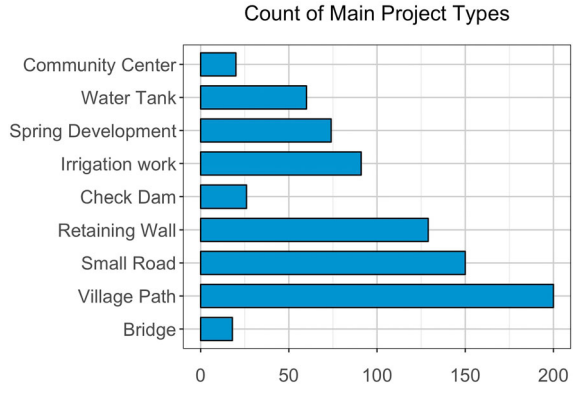

Figure 3. Count of main project types in the dataset.

wet and muddy paths often become difficult to traverse and mountain streams are flush with water and difficult to cross.

A substantial number of projects (251) focus directly on issues related to water management. Major categories of this work include renovation projects on water canals, water tanks used to capture and store rainwater, check dams to slow the flow of water and direct it to productive use, and spring renovations that enhance water holding capacity at key discharge points. Based on observed benefits captured through focus group discussions in the project format, 79% of these are reported to improve water availability for irrigation, drinking, domestic use, or livestock (Figure 4). Of projects most commonly associated with irrigation – canal works, tanks, and check dams – 61.5% (109 of 177) have improved water availability specifically for irrigation purposes. 80% of spring projects (59 of 74) have improved water availability for drinking or domestic needs. Such projects are particularly important during the pre-monsoon months when water shortages are often acute.

The impacts captured in the survey are, in many cases, only a subset of the benefits that can be observed during field visits. Local leaders often describe in detail the rationale for different planning decisions, and the ways that they have sought to use the opportunities under the Act to address local challenges. During a visit to one project jobsite, a local mason described how he worked with an elected ward member to develop a project to widen and deepen a canal (Figure 5), in which heavy siltation had reduced water flow. Through consultation with area households, the two decided also to build a retaining wall to prevent flooding of common grazing land adjacent to the canal – a frequent occurrence during heavy monsoon rains – which was then incorporated into overall project design in collaboration with low-level bureaucratic staff. In another example, the head of a local irrigation committee described approaching the elected pradhan to undertake renovation of the village's main canal, which was leaking water in a critical section due to damage from a severe storm several years prior. The pradhan developed a project to repair the leak (Figure 6) and then proceeded to undertake extensive earthen renovation downstream, thus improving water flow along the rest of the canal.

Together, these interventions highlight some of the ways in which MGNREGA projects have been used to address site-specific climate risks and challenges. To be clear, not all projects are as successful as these; 9 (3.6%) of the water-related projects

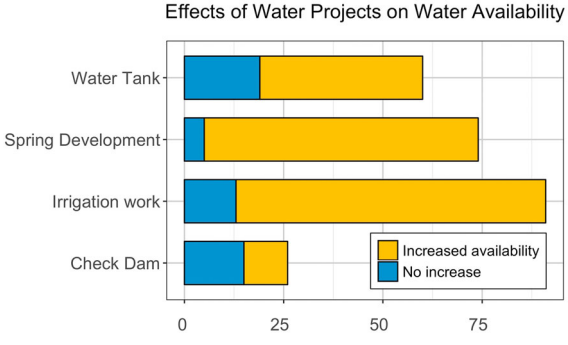

Figure 4. 79% of water projects report improving water availability for drinking, domestic use, irrigation, or livestock.

Figure 5. The canal was desilted and widened to improve water flow.

in the data have either reduced water access or increased flooding, likely as a result of poor design or implementation. At the aggregate, however, the high degree of benefits is notable, especially for a sector known for frequent unsatisfactory outcomes. The successes observed here are no anomaly; similarly high levels of project benefits have been observed elsewhere in India as well (Ranaware, Das, Kulkarni, & Narayanan, 2015). As the examples above reveal, the Act's decentralized architecture has helped to contribute to these successes by supporting projects that incorporate substantial local knowledge of context-specific needs and conditions into their design.

4.2. Labour benefits

Although a smaller subsection of society benefits from labour in comparison to projects, a majority still do; approximately 2/3rds of households in the data (887) report receiving at least some labour under the Act. Of those, the median value is 120 days – 40 days per year on average between 2010 and 2012.[2] Importantly, MGNREGA is far from the primary income source for most households. At the time the survey was conducted, wages were set at 126 rupees per day in Himachal Pradesh (about $2.30 USD at then exchange rates) – much less than other non-farm employment options available (skilled masons or woodworkers, for example, reported wages of 250 or more). Still, the high proportion of households that continue to receive labour at significant levels underscores the Act's continuing importance, even where other livelihood options exist.

Importantly, the distribution of labour benefits varies across different segments of society. Women are more likely to receive labour than men; women account for almost double the labour

Figure 6. The upper layer of the retaining wall was repaired following damage of a storm, helping to ensure continued water availability downstream.

days of men in the dataset (Figure 7). Overall, households that are low caste, below the poverty line (BPL), and those without steady off farm income – including from a salaried position or government pension – are more likely to seek and receive labour; those that do receive more employment overall (Figure 8). These findings suggest that labour benefits are going poorer and less privileged households, however it is notable that many others – not just the very poor or historically marginalized populations – still receive significant labour as well.

Qualitative interviews with women in the study area show that MGNREGA's contributions to women's income is one of the most important ways in which it is enhancing livelihood security. As a source of income close to home, many women report that MGNREGA can be aligned with other household activities, including livestock rearing, agriculture, and fuelwood collection, which women tend to oversee. For many women, MGNREGA labour is among the only source of income available outside of seasonal agricultural labour.

One such example is Binju Devi. Her husband, a taxi driver in Delhi, drinks to excess and rarely sends money home. A relative pays for her son's schooling, while she supports her two daughters' education herself; most everyday expenses are born by her alone. She maintains a tight purse and saves every rupee she can. During the agricultural season, she works the family's land to grow rice to feed her family and as a wage labourer on other farms. She seeks out casual labour in the village at other times, but opportunities, she says, are highly variable. She often gets employment through the MGNREGA, which provides a crucial source of income to support her family when other options are unavailable.

Another example is Anshu, an elderly woman now in her 70s. Tragically, she has outlived all of her immediate family members, including her husband and children, and she now must take care of herself. Her right hand has become disabled in her old age; as a result, few will hire her for labour in the village. Several years ago, she sold a large portion of her land to

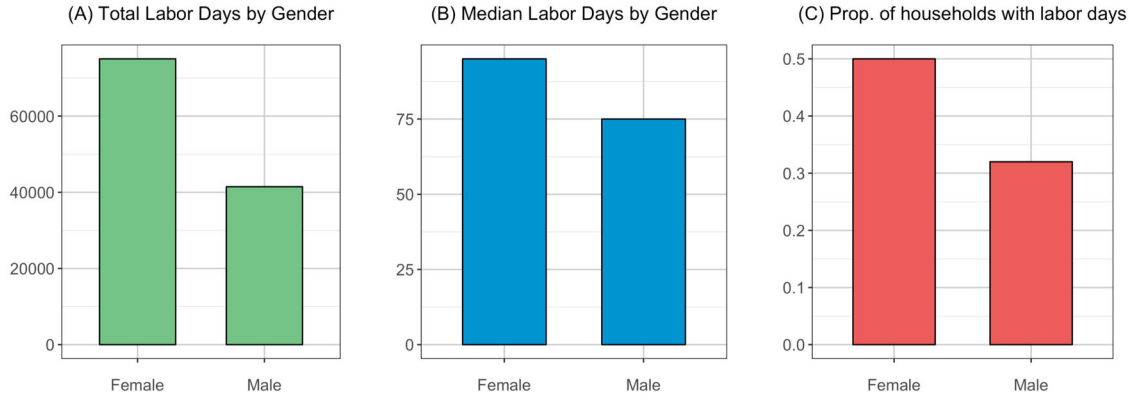

Figure 7. (A) Total labour days for men and women, (B) median labour days (for those who had received labour), and (C) the proportion of households who have received labour from each gender in the primary data.

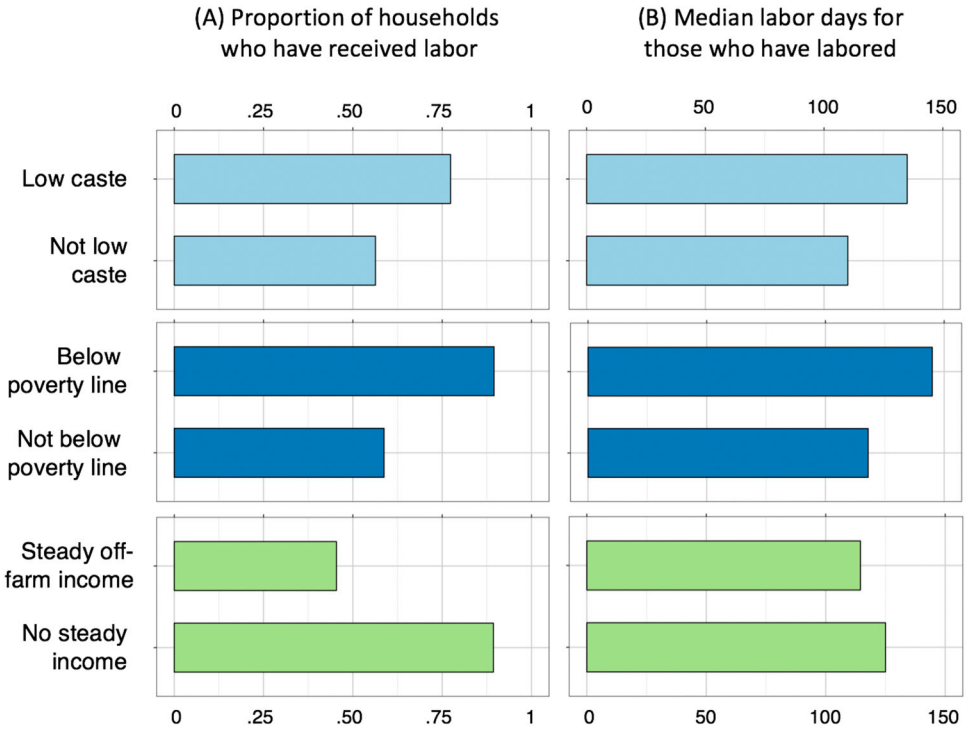

Figure 8. (A) Proportion of households who have received labour and (B) Median labour days of those who have received labour from different social groups (2010–2012).

supplement her limited income. She grows her own crops, and brews alcohol from fermented rice which she sells from her doorstep after nightfall, but she earns only very little. Since its arrival in the village, the MGNREGA has become an important means to earn extra wages, which now plays a critical role in helping to sustain her basic needs.

These stories provide just two examples of how the MGNREGA has helped to protect the basic welfare of some of the most vulnerable subsections of society. Although the data does not provide a detailed understanding of how labour under the Act factors into a broader set of strategies that households use to confront climate risks, the aforementioned examples provide some insight. For people with limited alternative employment options, the MGNREGA serves as an important part of a broader livelihood basket, which offers at least some buffer against loss. Even for those that do not seek labour under the Act regularly, it may still serve as an important fallback option to cope with the aftermath of a shock. In either case, wages may provide an extra measure to safeguard critical household priorities, such as children's education, or to protect basic consumption needs, as has been observed elsewhere (Dasgupta, 2017; Patnaik, Das, & Bahinipati, 2016). In so doing, labour under the Act serves a dual function of helping households to respond to short-term exposure to shocks, while also contributing to more secure livelihoods overall.

4.3. Labour and infrastructure projects: exploring the relationship

The above analysis provides a snapshot of the ways in which MGNREGA's benefits are experienced at the local level. Labour and projects serve very different functions, which respond to different household needs. Labour is centred around protecting individuals' private consumption and personal investments; small-scale infrastructure focuses primarily on public assets designed to enhance livelihoods and their security. Notably, the Act is not just providing these benefits, it is providing them simultaneously – often for the very same people.

To better understand patterns of benefits between different households, we compare two variables that serve as a proxy for the extent of benefits received under the act, both of which are derived from data on the household survey: (a) the total number of labour days that a household has received (2010–2012) and (b) the total number of projects that they report having benefitted from. Comparing the two benefits reveals a striking relationship. As Figure 9 shows, increasing labour days received under the act show a strong positive association with an increase in project benefits (Spearman's

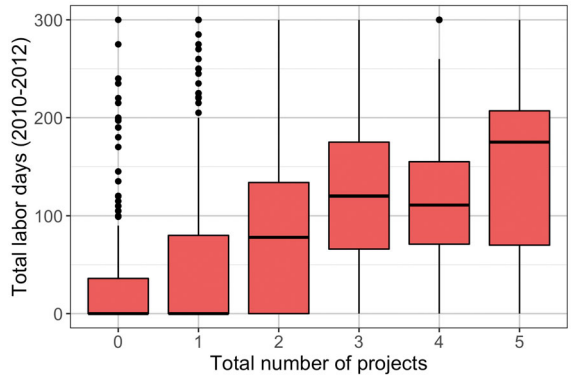

Figure 9. Boxplot of the relationships between total labour days and number of projects that a household has benefitted from.

rho .4319, $p < .0001$); the more labour a household receives, the more projects they tend to receive as well and *vice versa*. By targeting different kinds of needs, often for the very same people, these findings suggest that the Act has important complementary effects in contributing to households' overall security that go beyond any single benefit alone.

Nevertheless, there remains a great deal of variability in access to both kinds of benefits. While some people do receive their full labour entitlement, others – among them, Anshu noted above – reported that their requests for labour were at times unanswered. Likewise, the placement of projects is not necessarily equitable. While the substantial proportion of the population that has received at least some project benefits suggests that absolute marginalization may be limited, in interviews some respondents felt that their own priorities had been devalued in favour of other community interests. At the panchayat level, there are various reasons why MGNREGA's benefits are uneven. Local leaders may work hard to provide as many projects as they can, or they may be satisfied with providing periodic works that only partially satisfy demand. They may focus on the interests of a broad cross-section of society, or they may be inclined to favour those of close affiliates. While much has been written about the politics of MGNREGA's implementation, most work to date has focused on the nature of clientelist relationships that mediate access to labour in different contexts (Das, 2015; Maiorano, Das, & Masiero, et al., 2018). Relatively little is known about the local political conditions that make elected authorities more responsive to the public more generally, especially with regard to project planning.

To try to better understand the factors that shape access to MGNREGA's benefits, the following analysis explores the relationship between household socio-economic conditions, different dimensions of local political practice, and the Act's project and labour benefits (Table 1). Both labour and project benefits, described at the beginning of this section, are count variables; to account for under-dispersion and over-dispersion respectively they have been modelled with a Generalized Poisson Distribution (GPD).

The data has a hierarchical structure, comprising both household and panchayat-level variables. The extent of households' benefits is assumed to vary both according to the characteristics of a household as well as the panchayat in which it is situated where planning decisions occur. Each model thus contains a panchayat-level random intercept, which accounts for heterogeneity between panchayats that may influence the extent of either kind of benefit while still allowing analysis of panchayat-level variables that might influence access as well. The models also include a 'block'-level fixed effect to control for administrative differences in MGNREGA's implementation across blocks. By controlling for higher-level factors that may influence benefit provision, the analysis provides a particular look at the local-level political factors that shape patterns of benefits under the Act.

Both project and labour benefits are analyzed using a hurdle model, a two-part model that assumes that different processes lie behind zero values and positive counts. Analytically, it makes sense that many households may not receive labour or projects at all – they may, for example, not need either of these benefits to begin with – but that once this 'hurdle' is crossed, different processes may influence the extent of benefits that this household will receive. The first part of the hurdle model (Table 2) is a binary logit model which predicts a positive value (e.g. if a household receives at least some labour or projects), while the second part (Table 3) fits the positive values to a truncated GPD (e.g. the extent of labour or project benefits the household receives). Analysis occurred in R, using the glmmTMB package.

Table 1. Summary of variables for analysis of household project benefits (1400 households nested in 35 villages).

Variables	Mean	Range	Std. Dev.
Main indicator of household benefits:			
Number of labour days a household has received (2010–2012)	81.6	0–300	83.3
Number of MGNREGA projects a household has benefitted from	2.03	0–5	1.26
Household socio-economic characteristics:			
Household size (number of persons)	5.13	1–18	2.06
Below poverty line (BPL) (0 = no; 1 = yes)	.15	0–1	
Low caste (0 = no; 1 = yes)	.334	0–1	
Household member with some college education (0 = no; 1 = yes)	.336	0–1	
Proportion of house rooms made of concrete (as opposed to mud)	.370	0–1	.414
Landholding size (in bighas)*	7.02	0–90	7.00
Months of food consumption per year from own land	4.70	0–12	3.57
Steady income from salary or job-related pension (0 = no; 1 = yes)	.591	0–1	
Patterns of political engagement:			
Number of civic institutions that household is a member of	1.45	0–5	.891
Household interaction with elected *Pradhan* (1 = low, 2 = medium, 3 = high)	2.60	1–3	.541
Conflict between elected panchayat members (0 = no; 1 = yes)[a]	.743	0–1	
Proportion of households in attendance at panchayat meetings** [a]	.289	.137–.576	.085
Effective number of candidates standing for panchayat election*** [a]	2.90	1.49–4.82	.751
Positive relationship of panch. leaders with bureaucratic staff (0 = no; 1 = yes)[a]	.886	0–1	
Block level dummy variable: Lambagaon = 0; Baijnath = 1			
All models also include a panchayat-level random intercept			

[a]Panchayat-level variable (all others measured at household level).
*Land units measured in Bighas; 5 Bighas = 1 acre.
**Proportion in attendance overaged over two years.
***Total number of candidates standing for *pradhan,* weighted by vote share (following Laakso & Taagepera, 1979). Averaged over two election cycles.

4.4. Patterns of labour and project benefits

The analysis shows that labour and project benefits tend to flow disproportionately toward historically marginalized and poorer subsections of society. Households that are below the poverty line, low caste households, those without steady off-farm income (from a salary or pension), those with less modern housing (e.g. those with a fewer proportion of rooms that are concrete rather than traditional mud construction), and those that do not have a member with at least some college education all benefit more from both projects and labour. Importantly, landholding size does not predict the extent of either labour or projects, suggesting that benefits are not more likely to

Table 2. Hurdle model part 1: Binary logit model to predict a non-'0' value (indicating that a household has received at least some benefits).

Variables	Labour benefits	Project benefits
Household socio-economic characteristics:		
Household size	−0.0082	−0.1087*
	(0.0362)	(0.0497)
Below poverty line (BPL)	1.551***	0.1393
	(0.2651)	(0.2908)
Low caste	0.7146***	0.4996(*)
	(0.1663)	(0.2581)
College education	−0.8126***	−0.2176
	(0.1602)	(0.2274)
Proportion of concrete rooms	−0.8393***	−0.1204
	(0.1800)	(0.2802)
Log of landholding size	−0.1291	−0.3542(*)
	(0.1366)	(0.1969)
Subsistence consumption	0.0362	0.1063*
	(0.0308)	(0.0444)
Steady income	−1.662***	−0.2650
	(0.1830)	(0.2665)
Patterns of political engagement:		
Number of civic institutions	0.0844	0.4168**
	(0.0917)	(0.1296)
Interaction with elected *Pradhan*	0.0215	0.3248
	(0.1594)	(0.2101)
Conflict between elected authorities	0.5482(*)	1.080(*)
	(0.3327)	(0.5635)
Attendance at village meetings	4.676**	1.190
	(1.716)	(3.008)
Effective number of candidates	0.3726*	0.2194
	(0.1810)	(0.3105)
Positive relationship with technical staff	0.3523	2.601***
	(0.3817)	(0.6864)
Block level dummy	0.3650	−2.520***
	(0.3104)	(0.5810)

Note: Model includes a panchayat-level random intercept. Coefficients reported with standard errors in parentheses.
(*)$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

Table 3. Hurdle model part 2: Count model with truncated General Poisson Distribution.

Variables	Labour benefits	Project benefits
Household socio-economic characteristics:		
Household size	0.0042	−0.0024
	(0.0086)	(0.0065)
Below poverty line (BPL)	0.1187**	0.0833*
	(0.0426)	(0.0352)
Low caste	0.0988**	0.0554*
	(0.0355)	(0.0276)
College education	−0.0411	−0.0839**
	(0.0413)	(0.0290)
Proportion of concrete rooms	−0.0964*	−0.0584(*)
	(0.0442)	0.0321
Log of landholding size	−0.0253	0.0292
	(0.0345)	(0.0249)
Subsistence consumption	−0.0007	0.0027
	(0.0076)	(0.0056)
Steady income	−0.2247***	−0.1283***
	(0.0386)	(0.0282)
Patterns of political engagement:		
Number of civic institutions	0.0603**	0.1016***
	(0.0218)	(0.0159)
Interaction with elected *Pradhan*	0.0657	0.1634***
	(0.0400)	(0.0294)
Conflict between elected authorities	−0.0997	0.2746**
	(0.1022)	(0.1051)
Attendance at village meetings	0.9301(*)	0.5045
	(0.4838)	(0.5035)
Effective number of candidates	0.0466	0.0788
	(0.0572)	(0.0587)
Positive relationship with technical staff	−0.1174	0.1191
	(0.1229)	(0.1252)
Block level dummy	−0.3379***	−0.0155
	(0.0892)	(0.0911)

Note: Model includes a panchayat-level random intercept; coefficients reported with standard errors in parentheses.
(*)$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

favour landed elites. In fact, there is weak evidence to suggest that those with smaller landholding sizes are more likely to benefit from at least some projects; those that are more dependent upon subsistence cultivation are more likely to receive at least some projects as well.

Overall, therefore, both project and labour seem to be going to households with fewer assets and opportunities – in short, those who are most likely to experience negative effects of climate risk and change, and who are most in need of support to begin with. To some extent, this is likely an effect of the kinds of benefits that the Act was designed to give: both labour and small-scale communal assets seem naturally to respond to the needs to such groups and are likely to be less relevant to the upwardly mobile. At the same time, these findings affirm that these groups are able to make claims upon these benefits and receive them in alignment with their overall higher level of need.

Households' ability to access these benefits is not automatic, but dependent upon the nature of local political practice. As the analysis shows, households that belong to a larger number of civic institutions (women's groups, resource co-management committees, and micro-credit groups, among others) tend to benefit more from both projects and labour. This observation builds upon existing scholarship which shows that local civic institutions can play an important role in coordinating local responses to risk (Agarwal, Perrin, Chhatre, Benson, & Kononen, 2012; Villamayor-Tomas & García-López, 2017). In this case, the ability of such institutions to do so seems to have been based, at least in part, upon their role as channels for citizens to make claims upon their leaders. In one example, the author witnessed members of a women's group attend a village meeting in order to chastise the elected pradhan for failing to deliver sufficient labour; in several study sites, leaders associated with the local irrigation committee worked alongside elected panchayat leaders to coordinate renovation projects (section 4.1).

A closer relationship with the elected pradhan is also associated with access to more projects. This makes sense not only because a pradhan may choose to favour those she is close to, but because of how projects are often planned in the village. While shadowing elected leaders in several panchayats, the author found that a great deal of planning happens in informal forums, for examples the village tea shop, where potential plans are often discussed at length. A similar associations holds true if the relationship with the elected ward member is substituted for the pradhan in the model, suggesting that interaction with second-tier hamlet-level leaders may be similarly important in gaining influence on planning processes.[3] While an emphasis on interpersonal connections may in some cases result in preferential access for project benefits (see, for example, Maiorano et al., 2018), it also highlights the importance of direct interaction in the development of projects that align with local needs – a central justification for community-based approaches to climate adaptation (Forsyth, 2013; Kirkby et al., 2018). In

contrast, a household's relationship with the pradhan (or ward member) is not a significant predictor of labour access. Overall, providing labour does not require such intensity of interaction as project planning; this may also indicate that labour is more generally accessible regardless of interpersonal connections.

Importantly, the ability of citizens to engage effectively with their leaders is also contingent upon the broader set of incentives that their leaders face. As the analysis shows, internal conflict between elected panchayat members is associated with more project benefits. While conflict can, in certain extreme cases, paralyze local planning, the presence of conflict also seems to indicate a situation in which different interest groups are able to exert competing claims – and where existing power holders are unable to dictate their own decisions unchallenged. In one study panchayat, elected ward members of two different low caste groups (the *Lohar* and the *Sipi*) joined together to contest what they perceived to be an uneven share of projects for their hamlets in the panchayat. After a protracted fight with the pradhan (and threatening to levy formal accusations of corruption against her), she finally allowed each to build projects they had proposed. The salience of conflict among elected leaders underscores the important role that different leaders – ward members in particular – play in lobbying for projects for their constituencies. The balance of power between different representatives may be just as important as particular tactics of citizen engagement in determining access to benefits (Fischer, 2016).

Two panchayat-level variables are associated with greater labour access. Panchayats with a higher attendance at village meetings (averaged over a two-year period) have a greater prevalence of households that receive at least some labour; there is some indication that higher attendance is also associated with greater labour provision overall. Similarly, panchayats with a higher 'effective' number of candidates for *pradhan* (averaged over the past two election cycles) – a measure of weighted vote share that serves as a proxy for political competition (Laakso & Taagepera, 1979) – are also more likely to receive at least some labour. Together, this seems to suggest that more dynamic political engagement, in terms of both electoral competition and direct participation, results in a wider distribution of labour benefits within society. Both imply an incentive structure under which local leaders must continually work to sustain public support (Daftary, 2010; Faguet, 2014). Yet the relationship may work in the opposite direction as well, where the availability of work stimulates greater engagement. During interviews, some labourers indicated that they attend meetings because it is the best way to make a claim for work on upcoming projects. In some cases, there may thus be a positive feedback between benefit provision and more active citizen participation in local politics (Abraham, 2014, see also Ribot, 2001).

Geography also matters. Households in Lambagaon block tend to receive more labour than in Baijnath, and they are more likely to benefit from development projects. Overall, Lambagaon is less developed socio-economically, while its presence at the lower reaches of the district far below the High Dhauladhar Range also means that it has far more acute experiences of water shortage in the premonsoon months. It is thus no surprise that households in this block request and rely more on MGNREGA benefits. Finally, a supportive relationship with low-level technical staff in the development bureaucracy is a strong predictor that a household will benefit from at least some projects. Whereas labour is relatively easy to oversee, designing effective local projects often requires significant technical support. This variable hints at the important role that the broader administrative structure plays in helping to provide a basis to translate local decision-making processes into tangible outcomes on the ground (Kirkby et al., 2018; McNamara & Buggy, 2017).

5. Discussion and conclusion

The MGNREGA incorporates three key policy strategies that have been viewed as important avenues for providing support to vulnerable communities in the context of climate change – social protection, small-scale infrastructure development, and a community-based planning architecture. The analysis above shows that the Act is indeed bringing important benefits to the public, which is reducing exposure to climate and other risks in a variety of ways. Development projects are helping to mitigate several key climate-related challenges that area households face, while labour provides a critical contribution to the basic livelihood security of many marginal groups, with important implications for their capacity to confront climate and other threats. Both benefits flow disproportionately toward poorer and more marginal subsections of society. The overall high degree of positive benefits is notable, especially given the variable outcomes resulting from public support systems in India and elsewhere in the world.

The MGNREGA has important implications for how policy might envision and pursue future efforts for pro-poor climate support. To begin with, vulnerably is a multi-faceted phenomenon; no single kind of support is likely to be enough (Fischer & Chhatre, 2015; Williams et al., 2015). While the need to integrate climate vulnerability reduction with broader rural development objectives is by now widely recognized (Ayers & Dodman, 2010; Schipper, 2007), recent scholarship has focused on the potential synergistic effects that may emerge by linking broad-based social protection policies with more specific interventions to target climate risks (Davies et al., 2009; Lemos et al., 2016). The MGNREGA is one example of an already existing, large-scale policy mechanism that seeks to ameliorate household vulnerability in multiple ways. While existing scholarship shows that both MGNREGA labour and projects have helped households respond to climate challenges in some contexts (Esteves et al., 2013; Godfrey-Wood & Flower, 2018), the present analysis suggests that there may be important synergies in how these two benefits work together – by advancing complementary support for different aspects of rural livelihoods, often for the very same households simultaneously. Moving beyond a focus on individual policy strategies and their effects, the analysis underscores the need for a deeper understanding of the 'policy mixes' that can work together to achieve reductions in vulnerability on multiple dimensions.

To the extent that many climate interventions will need to be coordinated locally, the analysis shows that there are indeed important benefits of a decentralized planning architecture. Much as proponents of community-based adaptation have

argued (Forsyth, 2013; Wright et al., 2014), the evidence suggests that local input in project planning – from selection through design – has played an important role in generating interventions that effectively target local needs and context-specific conditions. Still, the analysis also shows that a decentralized planning architecture is by itself not enough; much depends upon the nature of local political practice. While some scholars have cautioned that local power asymmetries risk marginalizing the poor in community-based climate planning (Dodman & Mitlin, 2013; Nagoda & Nightingale, 2017), to date relatively little is known about the conditions that can support long-term transformations in local political practice in order to bring about more democratic and equitable decision-making processes (Engle & Lemos, 2010; Mikulewicz, 2018). At the very least, the paper suggests that the decentralized architecture of the MGNREGA has opened up new avenues for citizens to claim benefits from the state, while more dynamic political engagement is associated with greater responsiveness of local leaders toward a broad cross-section of citizens' needs. By further consolidating local institutions as meaningful arenas of local planning for climate and other challenges, that Act may also strengthen the character of political participation more generally, leading to improvements for other state support mechanisms as well – climate or otherwise.

Notes

1. Baijnath block also has a substantial (14%) *scheduled tribe* (indigenous ethnic group) population. However, a vast majority belong to the *Gaddi* tribe, whose members tend to be comparatively well off and not generally considered to be a socially marginalized population.
2. In order to reduce recall bias, the survey enquired about labour days only for the three years preceding the survey.
3. Coefficient 0.171, with standard error 0.0353; $p < .001$.

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