



Gender-sensitive social protection in the face of climate risk

A study in Uttar Pradesh,
Rajasthan and Madhya Pradesh,
India

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- Supporting climate change negotiators from poor and vulnerable countries for equitable, balanced and multilateral solutions to climate change
- Building capacity to act on the implications of changing ecology and economics for equitable and climate-resilient development in the drylands.

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Climate change is likely to exacerbate gendered vulnerabilities and compound intersecting forms of discrimination against women. International donors and policymakers are increasingly interested in strengthening social protection programmes to address such adverse impacts, but there is a lack of evidence about how this can be achieved. Addressing this gap, this paper examines the potential of the Mahatma Gandhi National Rural Employment Guarantee Scheme to reduce women’s vulnerability to climate risks in Uttar Pradesh, Rajasthan and Madhya Pradesh in India. It provides lessons on priority action areas for integrating gender within the planning, implementation, and monitoring of the programme to better meet women’s needs in the face of climate risk.

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Summary

The 2021 Intergovernmental Panel on Climate Change (IPCC) report is a 'code red for humanity'; climate change is widespread, rapid and intensifying. It is likely to exacerbate gendered vulnerabilities and compound intersecting forms of discrimination against women (Jordan, 2019; Sultana, 2014). Policymakers and international donors are increasingly interested in strengthening social protection programmes to address such adverse impacts, but there is a lack of evidence about how this can be achieved. Addressing this gap, this paper examines the potential of the Government of India's Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) under the Ministry of Rural Development to reduce women's vulnerability to climate risks through a qualitative study in Uttar Pradesh, Rajasthan and Madhya Pradesh in India. India is a suitable place for this research because it is one of the most vulnerable countries to climate change, and MGNREGS is the largest public works-based social protection programme in the world in terms of household coverage (Eckstein et al., 2018; UNDP, 2015).

Study findings

Although MGNREGS does not have women's empowerment or transformative gender outcomes as a core goal, it outlines a range of gender-sensitive provisions in its design, as well as provisions that were not made exclusively for women but have the potential to be beneficial for them. These provisions include mandating that at least one third of workers should be women, that there should be no difference in wages paid irrespective of gender, good working conditions and worksite facilities such as crèches and safe drinking water. MGNREGS outcomes are beset with debate, but one area that is not open to much disagreement is the high participation of women across rural India: 53.18 per cent of the annual person-days generated under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) were by women in the 2020–2021 fiscal year. However, the findings establish that although MGNREGS provides livelihood opportunities (albeit limited), it largely only provides women with forms of support that have the potential to act as a safety net during times of stresses and shocks (some climate-related and some not) and therefore fails to offset the ongoing impacts of climate risk in the villages studied, let alone those of future climate

change. This limitation arises from the lack of livelihood security via the provision of wage labour (including dysfunctions in MGNREGS' implementation), uneven distribution of benefits from asset creation, unpaid care work responsibilities, lack of implementation and monitoring of gender-sensitive provisions and worksite facilities, and lack of bargaining power and control in decision-making on planning and implementation of the programme.

Key priority areas for action include (drawing on Holmes and Jones, 2011; Jones et al., 2010; Pereznieto and Holmes, 2020; Steinbach et al., 2020; UNICEF 2020; Zaidi et al., 2017):

1. Develop women's skills and occupational training in the non-farm sector to reduce dependence on climate-sensitive economic activities.
2. Provide climate-responsive wage payments that are accurate, timely and predictable.
3. Develop gender awareness training for implementing staff at all levels to ensure the effective implementation of gender-sensitive provisions stipulated in the MGNREGS, as well as provisions that were not made exclusively for women but have the potential to be beneficial for them in the face of climate risk.
4. Coordinate community awareness-raising activities on the entitlements and rights provided for in the scheme and grievance mechanisms, particularly gender-related dimensions.
5. Develop training and awareness-raising campaigns on gender equality and women's rights for MGNREGS workers and the wider community, with a particular focus on engaging men to influence positive gender outcomes at the household level.
6. Promote women's active engagement in designing, planning and monitoring of MGNREGS works through the Gram Sabha (principal forum for wage seekers to raise their voices and make demands) and social audit processes with set quotas for women's representation, as well as an emphasis on the inclusion of different groups of women given that their views on the location and type of assets that would help meet their priorities and needs in the face of climate risks are influenced by multiple and intersecting social categorisations.

7. Champion women's participation in community decision-making through adopting a range of supporting provisions: flexible meeting timings that are compatible with women's roles and responsibilities; consultation with different groups of women on suitable meeting venues and meeting times, including a recognition of potential safety concerns; and transport to meetings if there is a need.
8. Create an enabling environment where women feel confident and supported in making substantive inputs to decision-making, especially in contexts where women are not usually heard. This would involve a range of mechanisms to build confidence, such as convening women-only meetings prior to the Gram Sabha to help them to express their views with the support of 'Gender Champions'.
9. Establish flexible working hours that recognise the vulnerabilities and needs of women at different stages of their lifecycle at the workplace, including women's unpaid care responsibilities, regular breastfeeding breaks for women with young children, and the provision of suitable facilities for women to breastfeed.
10. Utilise Self-Help Groups (SHG) to develop an exchange programme between MGNREGS projects aimed at sharing best practices in creating gender-responsive and climate-resilient infrastructure.
11. Re-design the MGNREGS' Management Information System (MIS) to improve programme effectiveness for different groups of women in the face of climate risk.

MGNREGS should not only provide strategies that allow at-risk people to survive climate risks, but also enable them to thrive despite climate risks and the uncertainty that it brings. This is particularly important when climate impacts deepen women's time poverty and concerns about care responsibilities, which are already stressful in current climate conditions. The implication is that MGNREGS itself needs to adapt; there is a need for innovative provisions that purposefully challenge unequal gender relations and the structural and root causes of discrimination.

1

Introduction

Climate-related risks to livelihoods, food security, water supply, health, economic growth and human security are projected to increase with global warming of 1.5°C and increase further with 2°C (IPCC, 2018). A recent study (Jafino et al., 2020) updates previous estimates, and suggests that climate change will push up to 132 million additional people into extreme poverty by 2030, with these poverty impacts increasing after 2030. These estimates are of similar magnitude to the global poverty impact of the COVID-19 pandemic in 2020, with the total rising to as many as 150 million people pushed into extreme poverty by 2021 (World Bank, 2020). But people will not all face these risks in the same way, as the impacts of climate change are unevenly distributed; people that are marginalised in society are especially vulnerable to climate change because of intersecting social processes that create multidimensional inequalities (IPCC, 2014).

The persistent determinants of vulnerability include contextual gender and power relations (Blaikie et al., 1994). Gendered vulnerabilities often occur in concert with other vulnerabilities, resulting in synergistic and reinforcing constraints (Tschakert and Machado, 2012). The impacts of climate change are experienced differently by women and men. This is due to socio-cultural norms and practices that influence: access and distribution of resources across time and space; participation in decision-making and politics; division of labour; knowledge and skills; safety and security; power structures; and persistent inequalities (Nelson and Stathers, 2009; Tschakert, 2012). Women as a group are often more vulnerable to various climate and non-

climate risks when such risks reinforce existing patterns and practices of discrimination. Though climate change impacts increase the productive workloads of both men and women, women also experience increased unpaid care responsibilities such as walking longer to collect water¹ (Jordan, 2019; Muthoni and Wangui, 2013; Resurrección, 2013). A study in Andhra Pradesh in India found that low rainfall has put women, especially women of lower castes, under increased pressure to earn off-farm income to compensate for low yields (Lambrou and Nelson, 2013). In Bangladesh, although climate shocks affect overall food security, women are most affected as food is unevenly distributed among family members (Jordan, 2019). Gender-based violence was found to have increased by 30 per cent in the aftermath of the 2009 drought in Kenya (Kolmannskog, 2009). Such increases have been attributed to a hyper-masculine culture that encourages sexual exploitation and abuse in the male-dominated response to disaster situations. In other studies, increases in violence have been attributed to disrupted safety nets and increased stress levels.²

Different groups of women in the same community (or even household) are not affected equally and do not experience the same level of vulnerability (Carr et al., 2016; Sultana, 2014; Wisner et al., 2004), as power operates to create inequalities based upon not only gender, but also other social differences (Nightingale, 2017; Moosa and Tuana, 2014). There are multiple intersecting axes of difference and identity that shape how the impacts of climate variability and change will be distributed and experienced by individuals and groups (Osbourne, 2015; Elmhirst and Resurrección, 2008).

¹ The IPCC's 2014 Fifth Assessment Report expressed 'high confidence' that a key climate risk is declining work productivity, increasing morbidity, and mortality from exposure to heatwaves, with women who have to walk long hours to collect water identified as a particular group at risk (Field et al., 2014).

² This paragraph and the next is based on material previously published in Jordan (2019).

A 2016 study (Ravera et al.) found that in India, some higher caste women with higher levels of education and wealth were better able to renegotiate their roles in decision-making and develop a diversity of proactive ecosystem-based management strategies to reduce their vulnerability to a range of stresses. In south-west Bangladesh, a study (Jordan 2019) found that women from wealthier households were able to avoid or at least reduce the arduous task of fetching water as they are often able to use the sweet water stored in their reservoirs during times of high salinity, or can afford to pay someone to collect drinking water for their household. This places wealthier women at a significant advantage compared to poorer women, particularly elderly widows who are more likely to have reduced access to good quality drinking water when it is limited within the household. Huynh and Resurrección's (2014) study in Vietnam found that gender, household headship, age, and stage of life influence women's access to water, forestland and credit, which in turn determines their capacity to respond to agricultural water scarcity. For instance, some female-headed households could not adapt to water scarcity through increasing use of water from reservoirs due to their constraints in time and labour management compared to other women and men in male-headed households. Carr and Thompson's (2014) study in Mali found that senior women may be more vulnerable to variable precipitation compared to junior women as they are more reliant on added market sales of rainfed peanuts to bolster their earnings from their home gardens.

Given that many social protection interventions target women as the main beneficiaries, there has been a growing interest in its potential to reduce women's vulnerability to climate risk, for example, the 'Global social protection programme framework' of the United Nations Children's Emergency Fund, the Government of Bangladesh's 'Social security policy support programme', 'The Sahel adaptive social protection

programme' funded by a multi-donor trust fund managed by the World Bank, and the United Kingdom government-funded 'Infrastructure for climate resilient growth programme' in India. However, there is a lack of evidence to substantiate these links; indeed, to the best of our knowledge, there are no peer-reviewed journal articles that have empirically examined gender-sensitive social protection in the face of climate risk. Therefore, this paper aims to investigate the potential role of MGNREGS to reduce women's vulnerability to climate risks³ via qualitative case study research in twelve villages in Uttar Pradesh, Rajasthan and Madhya Pradesh in India. India is a suitable place for this research because it is one of the most vulnerable countries to global climate change, and MGNREGS is the largest public works-based social protection programme in the world in terms of household coverage with over 52 million households working under the scheme in the 2018–2019 fiscal year, rising to over 75 million in 2020–2021 (Eckstein et al., 2018; Maplecroft, 2011; MoRD, n.d.; UNDP, 2015).

This paper begins by providing a brief overview of the MGNREGS, followed by a discussion of the empirical approach adopted for this research. Next, it establishes five key interconnected factors that limit MGNREGS' potential to reduce women's vulnerability to climate risk: a lack of access to employment that provides livelihood security, uneven distribution of benefits from asset creation, unpaid care work responsibilities, lack of implementation and monitoring of gender-sensitive provisions, and lack of bargaining power and control in decision-making on planning and implementation of the scheme. It concludes with an appraisal of MGNREGS, providing recommendations on priority action areas for integrating and embedding gender within the planning, design, implementation and monitoring of the programme in order to better meet the needs and priorities of women in the face of climate risk.

³ The paper uses the term 'climate risk' rather than climate change, as this paper does not focus specifically on analysing future anthropogenic change in climate in either environmental or social aspects.

2

MGNREGS overview

This section begins by providing a brief overview of MGNREGS, followed by an exploration of its gender-sensitive provisions as well as other provisions that were not made exclusively for women but have the potential to be beneficial for them. Next, it examines the mixed evidence on MGNREGS' performance regarding women's empowerment.

International donors and governments spend more than US\$500 billion on large-scale social protection programmes in lower- and middle-income countries (Norton et al., 2020). Such programmes encompass a range of interventions from public works, safety nets, social insurance, cash transfers (with or without conditions) to social transfers that enhance vulnerable people's resilience to adverse stresses and shocks through "provid[ing] income or consumption transfers to the poor, protect[ing] the vulnerable against livelihood risks and enhanc[ing] the social status and rights of the marginalised; with the overall objective of reducing the economic or social vulnerability of the poor, vulnerable and marginalised groups" (Devereux and Sabates-Wheeler, 2004, piii).

The MGNREGA was passed in 2005 with the objective of enhancing income and food security for India's rural poor. The public employment programme, the MGNREGS, is India's central anti-poverty scheme. It has an annual budget of US\$8.26 billion in 2020–2021 (MoRD, 2021a), compared to an initial budget of US\$1.6 billion in 2006–2007. It is employing 119 million people and creating 3.89 billion person-days of work in 2020–2021 (MoRD, n.d.). To date, 153 million job cards have been issued to rural households making

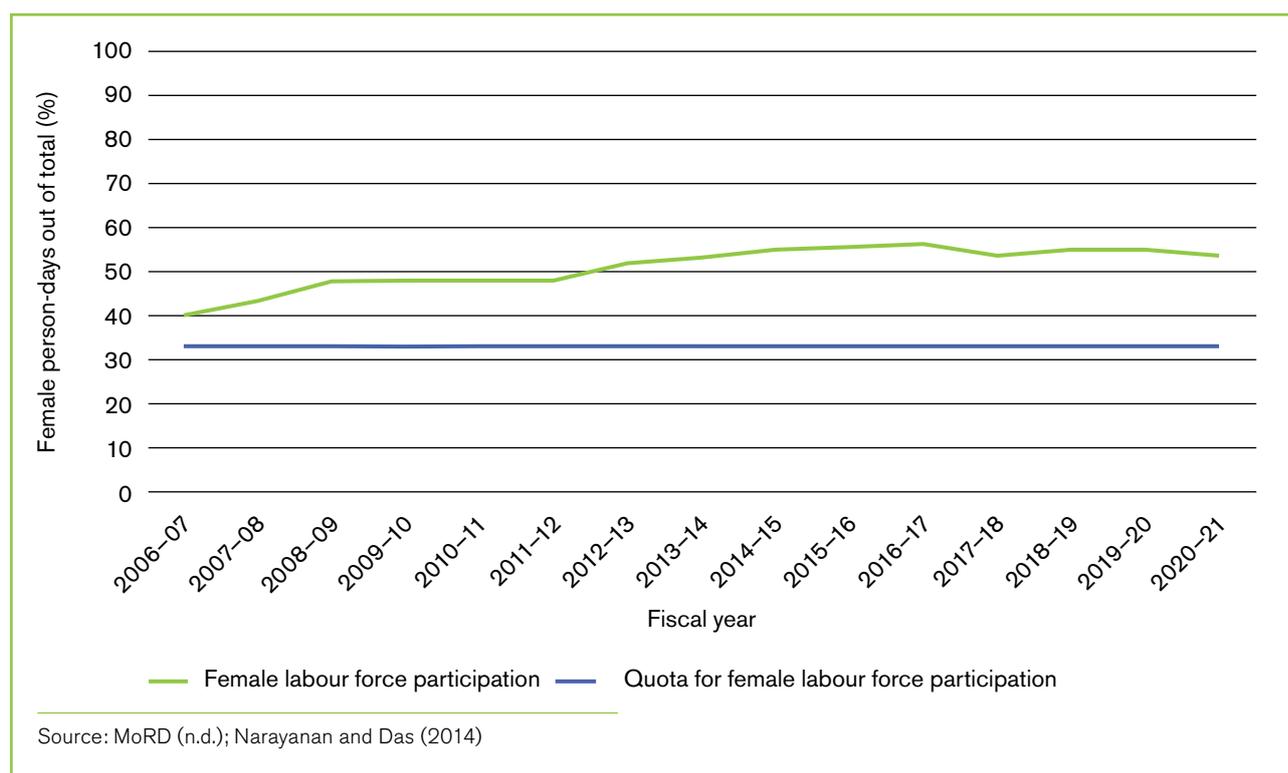
their holders eligible for work on demand (MoRD, n.d.). MGNREGS is intended to support rural livelihoods by legally guaranteeing the provision of 100 days of employment per year with a stipulated minimum wage (which is output- and task-based) fixed by the state to every rural household that demands work.

This employment is 'unskilled' manual labour directed towards the construction and maintenance of infrastructure (recently revised to include 263 permissible works)⁴ in rural areas. The infrastructure is intended to provide local public goods that contribute to sustainable livelihood opportunities or improve living standards, such as water conservation and water harvesting, drought proofing, irrigation canals, desilting of tanks, land development, flood control and protection and construction of all-weather roads. Although there has been a shift in the scheme's implementation to focus on the construction of durable assets, the programme is loaded in favour of job creation over asset creation (60:40 ratio of wage and material costs) (Pankaj, 2017).

The MGNREGS has been lauded for many achievements over the last decade: strengthening of democratic decentralisation; provision of employment to a large number of rural households; positive impact on the wage rate (including non-MGNREGS wage rate); smoothing consumption; reducing distress migration; improving mental health; building of assets; and contributing to inclusive growth (Berg et al. 2012; Hirway, 2010; Kareemulla et al., 2013; Mann and Pande, 2012; Murty and Reddy, 2020; Ravi and Engler, 2015). Though MGNREGS is part of India's climate

⁴ More recently, natural resource management has become an important component of MGNREGS. In the fiscal year 2020–2021, 69.92 per cent of total expenditure was allocated to natural resource management and water-related works (both local public goods and individual assets) in 2,264 water stressed blocks listed under the Mission Water Conservation guidelines (MoRD, 2021b; 2017). This compares to 61.6 per cent in 2006–2007 (MoRD, 2007).

Figure 1. Percentage of women workers in MGNREGS.



change strategy, there are few studies that examine its contribution to reducing vulnerability to climate risks. There is some evidence that MGNREGS has the potential to address climate vulnerabilities and their drivers through fostering livelihood security via the provision of wage labour, the creation of small-scale local infrastructure development that has the potential to reduce exposure to climate risks, and a decentralised planning architecture that can help bring about more effective, responsive, and locally tailored climate support (Adam, 2015; Esteves et al., 2013; Fischer, 2020; Godfrey-Wood and Flower, 2018; Kaur et al., 2019).

However, MGNREGS outcomes are beset with debate, with criticisms of corruption, elite capture, leakages and delays in wage payment, increases in child labour and school dropout rates, implementation irregularities not only across states, but also within states and across Gram Panchayats⁵ and villages in the same state, and unsustainability of assets (Aiyar and Samji, 2009; Chopra, 2019a; Das and Mukherjee, 2019; Himanshu and Mukhopadhyay, 2015; Jenkins and Manor, 2017; Manjula and Rajasekhar, 2015). One area that is not open to much debate is the high participation of women (Afridi et al., 2016; Borah and Bordoloi, 2014; Narayanan and Das, 2014; Pankaj and Tankha, 2010; Sahoo, 2014; Sridhar and Reddy, 2015; Xavier and Mari, 2014). Women have participated as workers in large numbers across rural India; 53.18 per cent of the

annual person-days generated under MGNREGA were by women in the 2020–2021 fiscal year (see Figure 1).

Although MGNREGS does not have women empowerment as a core goal, nor transformative gender outcomes that explicitly seek to address unequal gender relations and the structural and root causes of discrimination (Pereznieta and Holmes, 2020; UNICEF, 2020), it outlines a range of gender-sensitive provisions in its design as well as provisions that were not made exclusively for women but have the potential to be beneficial for them. These provisions include mandating that at least one third of workers should be women, that there should be no difference in wages paid irrespective of gender, caste or any other characteristic, good working conditions, preference to women to work on worksites closer to their residence, and worksite facilities such as crèches, safe drinking water, first aid kits, and shade for children (see Figure 2).

Studies have suggested that women's participation in MGNREGS has provided them with financial security and independence, increased recognition of their contribution to household income, raised their confidence and ability to exercise choice, given them discretion to spend and control the use of their earnings, and enhanced their decision-making role within the family (Afridi et al., 2016; Arora et al., 2013; Holmes and Jones 2011; Pankaj and Tankha 2010). However,

⁵ Elected local body at the village level.

Figure 2. Summary of gender-sensitive provisions in MGNREGS as well as other provisions that have the potential to be beneficial to women.



- One third reservation in employment for females.
- No gender discrimination in employment or payment of wages under the provisions of the Equal Remuneration Act, 1976.⁶
- The working hours of a worker shall be flexible; eight hours of work (including a one-hour break) can be spread across 12 hours on any day.
- Provision of a crèche facility if five or more children below the age of six accompany their mothers to a worksite. The crèche is to be staffed by one of the on-site female workers (e.g., elderly women, lactating mothers) who is paid wages equal to the other workers.
- Worksite facilities to be provided at all sites, including safe drinking water, first aid kits, and shade for children.
- Work to be provided within five kilometres of the worker's home. If some applicants have to work beyond five kilometres of their residence, they are paid 10 per cent of the wage rate as extra wages to meet additional transportation and living expenses. Preferential treatment is given to women (especially single women) and older people to work on worksites closer to their residence. The Gram Panchayat should identify widowed women, deserted women and destitute women and ensure that they are provided with 100 days of work.
- Pregnant women and lactating mothers (at least up to eight months before delivery and ten months after) should be treated as a special category and provided with work that requires less effort and is closer to their residence.
- Preference in appointment of mates (work supervisors) should be given to female workers or differently-abled persons; it is specified that at least 50 per cent should be women, preferably members of SHGs.
- Free medical treatment in case of injury in the course of employment, including cost of hospitalisation if required, and ex gratia payment in case of disablement or death in the course of employment.
- Free medical treatment for injury to a child accompanying any person employed on the worksite, and an ex gratia payment to the legal guardians in the case of death and disablement.
- Communication strategies targeting women, small and marginal farmers, families below the poverty line, scheduled tribes (ST), scheduled castes (SC) and other extremely disadvantaged groups to improve their participation in MGNREGS works.
- Awareness and outreach activities conducted to ensure that all wage seekers including women can handle bank procedures, especially in areas where they are unfamiliar with the banking system.
- Payments directly credited to the female's individual bank account.
- 50 per cent of Panchayat representatives tasked with overseeing programme implementation and giving input on village development plans should be female.
- At least one third of non-official members of the Central Employment Guarantee Council should be female, and no less than one third should be SC, ST, other backward castes (OBC) and minorities.
- At least one third of non-official members of the State Employment Guarantee Councils should be female, and no less than one third SC, ST, OBCs and minorities.
- Half of the members of the Vigilance and Monitoring Committee should be female and include SC and ST in proportion to their population.
- Legally mandates that the Gram Sabhas (see Figure 4) must undertake social audits of the works executed in each Gram Panchayat at least every six months. Guidelines state that women should have representation (although the exact number is not mentioned) and the forum should be conveniently scheduled for MGNREGS workers so that women and marginalised groups can attend.
- The social audit assessment index has been developed by Ministry of Rural Development (MoRD) and the Centre for Social Audit to support states to identify different issues that need to be improved. For example, the index is decreased if there is a low percentage of social audit unit resource persons at the block and village level that are women. Specifically, village social auditors should be drawn from women members of SHGs for an effective community accountability framework.
- Selection of 'Barefoot Technicians' should include adequate representation of women, SC and ST.

Source: Gol (2005); MoRD (2004; 2005; 2013; 2020ab)

⁶ However, the Act stipulates that wage rates are based on outputs as per a schedule of rates (SoR) that is fixed by state governments; there is no consideration of gender and how it intersects with other categories of difference (e.g., age, dis(ability), pregnancy, lactation and marital status) in determining the SoRs. The MoRD's 'Annual Master Circular 2020–2021' (p83) states that "separate SoRs shall be finalised for women, the elderly, people with disabilities and people with debilitating ailments to improve their participation", but this is not legally binding, and though it recognises the importance of some identity markers, it treats them as separate categories, rather than also considering how they intersect to create multiple forms of inequality for different groups of women.

there has been recognition that MGNREGS falls short of achieving women's empowerment despite a large proportion of workers being women (Chopra, 2019a; Lakha et al., 2015). Indeed, Chopra (2019a) argues that many researchers, academics and policy implementers have exclusively given attention to women's worksite participation, which has taken focus away from the limited delivery of the raft of gender-sensitive provisions outlined in Figure 2, as well as the realisation of sustainable empowerment of women workers.

Some studies, albeit mostly in limited detail, mention that worksite facilities stipulated in the MGNREGS are often not provided, including crèche facility, safe drinking water, first aid kits, shade for children, and periods of rest (Borah and Bordoloi 2014; Khera and Nayak, 2009; Sahoo, 2014; Singh and Datta, 2019; Vij et al., 2017).

There is evidence to show that women's employment in MGNREGS has increased gender-based violence, including kidnappings, sexual harassment and domestic violence (although there is some evidence that dowry⁷ deaths have decreased) (Amaral et al., 2015; Nair et al., 2014). Other studies suggest that divorced, separated, single and older women have been excluded from the scheme in some places (Bhatty, 2008; Sainath, 2007). Furthermore, it is unclear how sexual and gender identities, including non-western gender minorities, are recognised in MGNREGS. Considering the mixed evidence of MGNREGS outcomes, the suggestion from international donors and policymakers that it can meaningfully address women's vulnerability to climate shocks needs to be treated with caution.

⁷ Dowry is used here to mean a payment in cash or in kind to a bride's in-laws.

3

Research design and methods

This section introduces the empirical approach for this research in response to the gap in the evidence base outlined in previous sections. Next, it provides a brief overview of the study locations in Uttar Pradesh, Rajasthan and Madhya Pradesh, followed by description of the methods used to collect data.

This paper is based on a pilot study in three states of India, Uttar Pradesh, Rajasthan and Madhya Pradesh. This research is part of the United Kingdom Government's Foreign Commonwealth and Development Office-funded 'Infrastructure for Climate Resilient Growth' (ICRG) programme, which provides technical assistance to India's MoRD to improve the design and implementation of natural resource management activities under India's central anti-poverty scheme, the MGNREGS. As part of this programme, the International Institute for Environment and Development is supporting the MoRD and three states of India, Uttar Pradesh, Rajasthan and Madhya Pradesh, to develop a regional, detailed project report to seek additional climate finance from the National Adaptation Fund for Climate Change (NAFCC).

The decision to undertake a small-scale, preliminary study was driven by ethical, methodological and practical issues of carrying out empirical research during a pandemic (see Appendix 1), with the aim of providing lessons that can feed into and inform the

development of a future full-scale study as part of ICRG Phase II. The pilot study covers all states and districts that are included in the regional detailed project report. These states and districts were selected through a series of consultations with the MoRD and State Rural Development Department officials, field visits, community-level consultations and review of district-level climate risks and vulnerabilities based on the Central Research Institute for Dryland Agriculture's 'Atlas on vulnerability of India agriculture to climate change' (Rao et al., 2013) and state disaster management plans. All districts shortlisted were classified as highly vulnerable (see Table 1 for a brief overview of the climate context in the study locations). Thus, the 12 villages selected for this research were located in Banda and Mahoba districts, under Uttar Pradesh state, Barwani and Alirajpur districts, under Madhya Pradesh state, and Jodhpur and Barmer districts, under Rajasthan state. These villages and blocks (district subdivision) were selected because of the availability and willingness of women to participate in the study, the approval from the district collectors and block development officers to visit villages for data collection, and safety and security concerns (see Appendix 2 for a list of study locations).⁸ For an overview of the state of MGNREGS implementation and uptake in these respective states and districts, see Figure 3, Table 2 and Appendices 3 to 8.

⁸ There were difficulties in seeking permission from some district collectors and block development officers to visit villages for data collection. In addition, there were challenges with recruiting research participants due to social distancing norms, fear of COVID-19 among the residents of the village and data collection coinciding with the local festival, Makaskaranti.

Table 1. Climate context in the study locations

DISTRICT	OVERVIEW
Banda and Mahoba (under Uttar Pradesh state)	<p>Banda and Mahoba districts are in the dry Bundelkhand region of southwestern Uttar Pradesh. These districts have been historically exposed to several climatic and biophysical risks, including recurring droughts, floods, storms, rainfall variability and extreme temperatures leading to heat and water stress, groundwater depletion and salinisation, soil degradation and forest fragmentation. Droughts and heatwaves are the main environmental hazards. Maximum and minimum temperature in both districts is projected to increase by up to 1.5°C to 2.0°C and 2.5°C to 3.0°C from 2021–2050, respectively. Frequency of occurrence of very hot days (maximum temperature exceeds the normal by 4°C) is projected to increase. The number of dry spells (≥ 14 days of no rain) during the monsoon months of June to September is also projected to increase in both districts from 2021–2050.</p> <p>There is a very high dependence on agriculture in both districts, with 60–80 per cent of workers engaged in agriculture, increasing the sensitivity of rural households to these hazards. Rainfall in Banda and Mahoba is significantly higher than in Rajasthan. However, in Banda the soil is extremely sandy and has low water-holding capacity. High temperatures further exacerbate the situation, leading to high evapotranspiration and low recharge of ground water. Likewise, in Mahoba, groundwater availability is low and salinity levels are high, which puts agricultural livelihoods at risk. Flooding affects some communities in Banda that are located on low ground near large rivers, but this climate hazard is less frequent than drought and rainfall variability. The labour force participation rate is 48.97 per cent in Banda and 52.16 per cent in Mahoba, and per capita income is 36,320 rupees (£352.74) and 59,035 rupees (£573.35) respectively.</p>
Barwani and Alirajpur (under Madhya Pradesh state)	<p>Madhya Pradesh is exposed to extreme temperature, drought, floods and hailstorms. Alirajpur and Barwani have been exposed to extreme rainfall during the monsoon season, leading to swelling of the Narmada River and its backwaters, submerging several villages, and leading to the displacement of approximately 45,500 residents from flood-hit districts in Madhya Pradesh. Both districts have a relatively low annual rainfall compared to the state average of 1,160 mm (Barwani: 738.6 mm; Alirajpur: 912.8 mm) with very low groundwater availability. A decrease in post-monsoon and winter rainfall is projected for 2021–2050, as well as a very high rise in mean temperature over the same period in Madhya Pradesh. Climate variability as indicated by the variation in the maximum normalised difference vegetation index is indicated to be highest in Barwani. The districts have a high net sown area with high dependence on agriculture with 60–80 per cent of the work population engaged in agriculture, combined with high exposure to climate risks; Alirajpur and Barwani are highly vulnerable to climate. In both districts, farmers have limited access to markets. The labour force participation rate is 77.2 per cent in Alirajpur and 59.6 per cent in Barwani, and per capita income is 44,662 rupees (£433.76) and 48,066 rupees (£466.81) respectively. There is a high scheduled tribe population in both districts; 88.98 per cent in Alirajpur and 69.4 per cent in Barwani.</p>
Jodhpur and Barmer (under Rajasthan state)	<p>Rajasthan is exposed to high rainfall variability, extreme temperature, strong winds, floods/flash floods due to extreme rainfall events, land degradation and drought combining with high vulnerability to create a significant climate risk. Barmer and Jodhpur districts are situated in the highly arid and semi-arid zones of western Rajasthan, where low levels of rainfall and high temperatures lead to frequent and recurring droughts. Barmer and Jodhpur respectively receive an average of 310 mm and 378 mm rainfall annually. Annual rainfall and July rainfall are projected to decrease for 2021–2050. Between 2000 and 2017 both districts were affected by drought in 13 out of 18 years. Rural households here also face extreme temperatures that can reach nearly 50°C. Maximum and minimum temperature in the districts is projected to increase by up to 1.5°C to 2.0°C and 2.0°C to 2.5°C, respectively, for 2021–2050 and evapotranspiration rates are also projected to increase over the same period in Rajasthan. Recurring drought and extreme temperatures are already impacting agricultural production and water security. Groundwater is over-exploited in both districts and the area under irrigation is less than 20 per cent. Most households in Barmer and Jodhpur rely on rainfed agriculture, thus are highly vulnerable to current and future climate shocks. Barmer has poorer road connectivity and rural electrification compared to Jodhpur, but in both districts, farmers have limited access to markets. The labour force participation rate is 57.35 per cent in Barmer and 58.42 per cent in Jodhpur, and per capita income is 141,102 rupees (£1,370.38) and 85,470 rupees (£830.08) respectively.</p>

Source: Business Standard (2019); Government of Madhya Pradesh (2014); Government of Rajasthan (2011); IMD (2020); Indiatat (n.d.); Rao et al. (2013, pp. 35–40, 45–51, 55, 79, 85).

This pilot study is based on a qualitative multiple case study design (see Yin, 2009) to understand the potential role of MGNREGS to reduce women's vulnerability to climate risks.⁹ The data was collected in January 2021 and involved a total of 77 female residents (with a mean age of 39 years) from 12 villages. The case study is based on 12 in-depth focus group discussions, each lasting approximately 50 minutes to 1 hour 22 minutes, with an emphasis on context, quality, depth, richness and understanding. Participants were selected through purposeful sampling, as this enables close focus on cases and issues of interest. All participants selected identified themselves as active job card members, and a broad range of sub-groups were included in the sampling frame to ensure that the views of different groups of women that make-up the case study villages were captured (e.g., age, caste, marital status, and location of residence within the village).

COVID-19-related safety measures and social distancing norms were adhered to, and all participants provided informed verbal consent prior to participation in the study. Focus group discussions were conducted in Hindi, recorded with the participants' consent, transcribed in Hindi, translated verbatim to English, and lightly edited to ensure that the meaning of interviewees' responses was not misinterpreted and that the interviewees and people they mentioned could not be identified. All villages have been anonymised due to the sensitive nature of topics covered in discussions. Discussions were coded through intensive content analysis to draw out key themes, sub-themes and patterns.

⁹ The lead author provided intensive training on all aspects of research design and methods to the researcher carrying out the focus group discussions (the third author of the paper). This included focus group questions and probes, focus group discussion guidance and protocol, ethical protocol, code of conduct, and guidance on transcription and translation of discussions. This was supplemented with further training by the Institute for Sustainable Development, Research and Reforms on health and safety guidelines with a particular focus on COVID-19.

4

Results and discussion

This section presents the most significant findings from in-depth focus group discussions with women MGNREGS workers in Uttar Pradesh, Rajasthan and Madhya Pradesh, and also draws on MIS data to examine the potential of MGNREGS to reduce women's vulnerability to climate risks.

Although the data generated by a pilot study must be treated with caution, the evidence has highlighted common patterns and challenges among the twelve case study locations, and the pattern of results is broadly consistent with comparable empirical findings on gender impacts of the MGNREGS under ICRG Phase I, highlighting that this research is not dealing with unique effects and is of potential significance for moving towards gender-responsive social protection in the face of climate risk. Where the results significantly contrast with the earlier ICRG findings in Odisha, Bihar and Chhattisgarh this will be stated.

The findings highlight five key factors that emerged from the focus group discussions that limit MGNREGS's potential to reduce women's vulnerability to climate risks: (1) lack of livelihood security via the provision of wage labour, (2) uneven distribution of benefits from asset creation, (3) unpaid care work responsibilities, (4) lack of implementation and monitoring of gender-sensitive provisions and, (5) lack of bargaining power and control in decision-making on planning and implementation of the programme.

4.1 Livelihood security via the provision of wage labour

Agriculture is one of the sectors most vulnerable to climate risks (IPCC, 2014). There is a high dependence on agriculture across all the study districts, increasing the vulnerability of households to current and future climate shocks (see Table 1). India's agriculture sector is highly feminised with 65 per cent of the total female workforce engaged in agriculture (compared to 42 per cent of the male workforce) and many women also undertake unpaid family labour as cultivators or agricultural labourers (Pattnaik et al., 2018). In contrast to their high participation, women own 13.9 per cent of landholdings (GoI, 2019). Most of the respondents reported that they lease land as sharecroppers. As leasing land is legally restricted in Uttar Pradesh, Madhya Pradesh and Rajasthan,¹⁰ participants reported that agricultural land rental agreements are commonly informal agreements. The consequence of this arrangement is that there is no formal documentation of the leasing agreement, thus tenants are unable to access benefits provided by government to farmers, including credit and insurance agricultural subsidy and other agricultural support services, and cannot demand the minimum support price when they sell their crop (see Mandal et al., 2019). If the crop is lost due to climate-related risks such as drought, it is the landowner who is eligible for compensation rather than the tenant, as they are not legally recognised as a farmer in revenue

¹⁰ In Uttar Pradesh and Madhya Pradesh, land leasing is banned with exceptions granted to certain categories of landowners, such as widows, disabled people, defence personnel and minors (GoI, 2016; Government of Madhya Pradesh, n.d.). Though there is no explicit ban on land leasing in Rajasthan, terms and conditions of leasing are restrictive (Government of Rajasthan, 1955).

laws or in the relief code. Hence, tenants and small, marginal farmers, particularly women, are worst affected by climate risks due to lack of access to and control over land and limited employment opportunities in the non-farm sector. Women often experience additional burdens and domestic responsibilities because of male outmigration in response to lack of income (including falling agricultural income due to reductions in crop yields) and employment opportunities.

Some studies argue that as a universal, demand-driven instrument, the MGNREGS has the potential to address climate vulnerabilities through fostering livelihood security via the provision of wage labour (Adam, 2015; Fischer, 2020; Godfrey-Wood and Flower, 2018; Kaur et al., 2019). Although demand-driven job creation is an important principle of MGNREGS, the findings provide limited evidence that this has occurred. The average number of days of employment provided per household ranged from 34.8 days in 2017–2018 to 55.31 days in 2020–2021 in Madhya Pradesh (see Figure 3), with similar patterns across all the study districts and blocks in the state except for Sondwa block in Alirajpur district (50.52 days in 2017–2018 increasing to 68.26 days in 2020–2021). In Uttar Pradesh, 37.35 employment days were provided per household in 2017–2018, increasing to 41.82 days in 2020–2021, with comparable levels of employment provided per household across all study districts and blocks in the state. In Rajasthan, 53.11 employment days increased to 61.06 days,

over the same period, with similar patterns across all the study districts and blocks in the state except for Baytoo and Dhorimanna in Barmer district, which has a higher provision of employment per household. See Appendices 3 to 5 for average days of employment provided per household in all the pilot study districts and blocks across the three states.

MGNREGS may not have economic empowerment of women as a core goal, but its gender-sensitive design, such as mandating that at least one third of workers should be women, may have implications for reducing vulnerability to climate risks (Godfrey-Wood and Flower, 2018). The market wage rate of a male casual worker in most cases is higher than that of MGNREGS, thereby making employment in MGNREGS potentially more attractive to some female workers, who, in most cases, would earn less than their male counterparts in the open market (see Pankaj, 2017). 53.18 per cent of the annual person-days generated under MGNREGA were by women in the 2020–2021 fiscal year (see Table 2). In Uttar Pradesh state, the women person-days accounted for 22.17 per cent in the 2013–2014 fiscal year increasing to 33.59 per cent in 2020–2021, compared to 37.35 per cent to 42.65 per cent in Banda district and 34.69 to 37.78 per cent in Mahoba district over the same period. In Madhya Pradesh state, the women person-days accounted for 42.65 per cent in the 2013–2014 fiscal year decreasing to 40.49 per cent in 2020–2021, compared to 44.03 per cent to 43.05

Figure 3. Average days of MGNREGS employment provided per household.

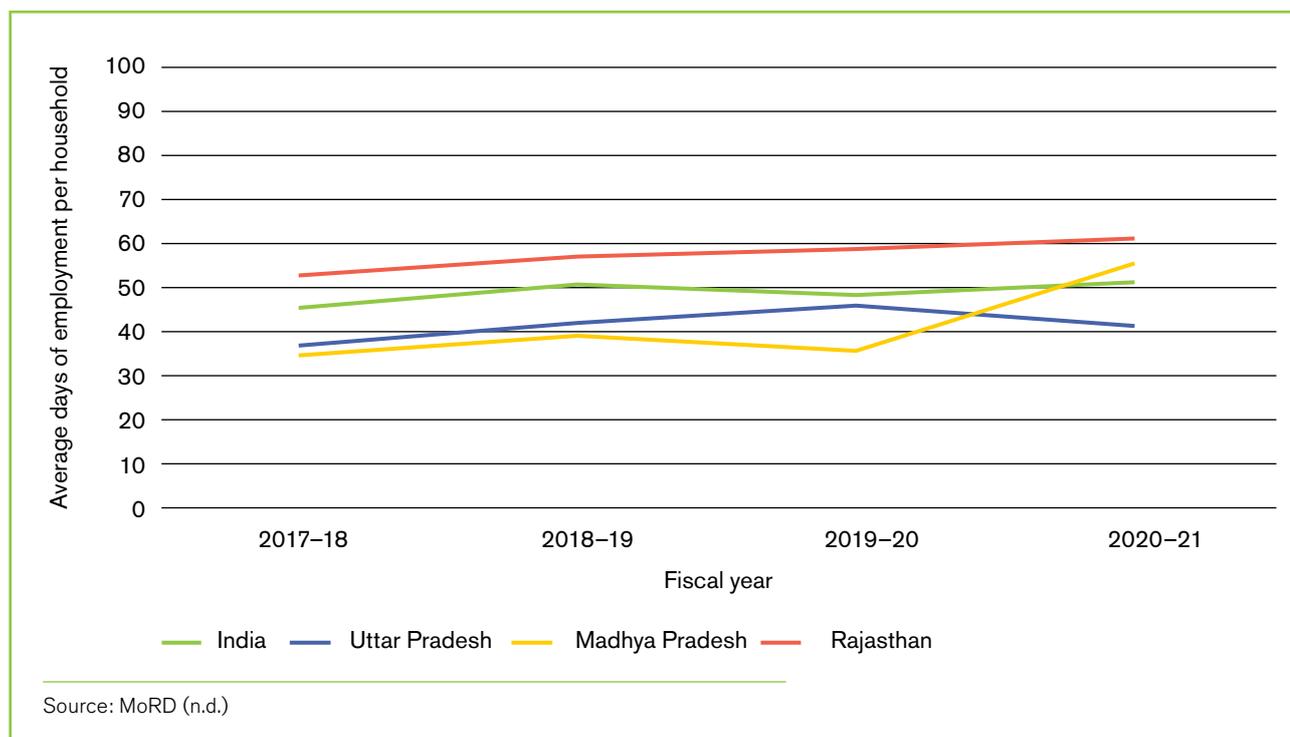


Table 2. Percentage of women workers in MGNREGS.

FISCAL YEAR	WOMEN PERSON-DAYS OUT OF TOTAL (PERCENTAGE)									
	UTTAR PRADESH STATE			MADHYA PRADESH STATE			RAJASTHAN STATE			INDIA
	Uttar Pradesh	Banda district	Mahoba district	Madhya Pradesh	Barwani district	Alirajpur district	Rajasthan	Jodhpur district	Barmer district	India
2013–14	22.17	37.35	34.69	42.65	44.03	42.85	67.76	75.21	59.97	52.88
2014–15	24.77	38.62	33.60	43.21	45.67	45.11	68.26	74.29	60.16	54.88
2015–16	29.52	40.09	37.68	43.15	44.87	42.64	69.03	74.65	60.43	55.26
2016–17	33.19	42.25	40.39	41.30	43.81	42.76	67.03	73.73	56.42	56.16
2017–18	35.11	42.19	40.11	37.37	41.89	38.53	65.33	70.53	53.91	53.53
2018–19	35.28	44.47	38.54	36.54	39.90	35.63	66.07	70.17	53.98	54.59
2019–20	34.28	42.58	37.27	38.11	41.76	38.65	67.33	71.39	55.02	54.78
2020–21	33.59	42.65	37.78	40.49	43.05	41.83	65.68	69.85	55.95	53.18

Source: MoRD (n.d.); Narayanan and Das (2014)

Note: some data was not able to be retrieved from MIS.

per cent in Barwani district and 42.85 to 41.83 per cent in Alirajpur district. Women make up a much higher proportion of person-days generated under MGNREGS in Rajasthan state, accounting for 67.76 per cent in the 2013–2014 fiscal year decreasing slightly to 65.68 per cent in 2020–2021, compared to 75.21 to 69.85 per cent in Jodhpur district and 59.97 to 55.95 per cent in Barmer district.

The potential of MGNREGS to contribute to women's economic empowerment is impeded by the limited number of workdays it provides to women, particularly in Uttar Pradesh and Madhya Pradesh. In Uttar Pradesh, 13.11 days of employment were provided to women per household in 2017–2018, increasing to 14.05 days in 2020–2021. In Madhya Pradesh, employment days provided to women increased from 13.00 days to 22.40 days over the same period. In Rajasthan, there is a higher provision of employment per household for women with 34.70 days in 2017–2018, rising to 40.10 days in 2020–2021. Despite a large number of women participating in MGNREGS as workers, this does not necessarily establish that provisions have encouraged female participation in the labour force as argued by McCord and Paul (2019). Other studies have found that many of the MGNREGS workers were already participating in the labour force as unpaid workers on family farms or were self-employed. Chopra (2019a) argues that MGNREGS appears to have substituted for other types of employment rather than providing more sources of income (Carswell and de Neve, 2013; Kamath 2010). This is evidenced by the labour force participation rate of females in India, which has declined from 25.51 per cent in 2011 (Gol, 2011) to 20.79 per cent as per the International Labour Organization

estimates in 2019, making it among the lowest globally despite the continued participation of women in MGNREGS. Numerous studies have established that women's exclusion from labour markets makes them less able to cope with and adapt to climate change impacts (Djouidi and Brockhaus, 2011; Rijkers and Costa, 2012).

Though most interviewees confirmed that MGNREGS work provides livelihood opportunities (albeit limited), they reported that the number of workdays is not enough to address women's underlying vulnerability to climate risks, rather it functions as a safety net. Furthermore, the study provides evidence that MGNREGS' ability to even act as a buffer against climate risks is impeded by a range of implementation irregularities. Indeed, all participants that were questioned on the procedures involved in demanding work were unaware that you must submit your work application to the Gram Panchayat or to the block office, and that if employment is not given within 15 days you are entitled to unemployment allowance (at the rate of 0.05 per cent of the unpaid wages per day in addition to the wage due). Furthermore, most participants reported cases of non-payment of wages, partial payment, or wages that had not been paid within the stipulated maximum period of 15 days (wages should be paid within a week, or 15 days at most, as per the MGNREGA) even during times of climate-induced risk and COVID-19. In many cases interviewees reported delays of up to two to three months.

In contrast, the MIS of MGNREGS indicates that 50.09 per cent of payments were generated within 15 days of the completion of work, based on muster rolls records of the work completed by each worker

in 2012–2013, rising to 97.11 per cent in 2020–21 (MoRD, n.d.). It is important to note that the Union Ministry of Rural Development views wages as paid when the fund transfer order (FTO) is signed by the second signatory; delays in the processing of signed FTOs are not accounted for when calculating compensation, nor is it recorded in the MIS. Indeed, it is possible that at least some of these payments were paid within the stipulated period, but that workers were unaware that their accounts had been credited as a small number of women reported that they were not always aware when payments were made as they did not have access to mobile phones to receive the SMS alerting them that their wages had been credited to their accounts or, due to low levels of literacy, they could not read the message.

Clearly, the lack of implementation of MGNREGS provisions to ensure wage payments are accurate, timely and predictable act as a barrier for women to use workdays strategically during times of acute need. In contrast to earlier studies (Godfrey-Wood and Flower, 2018), this study highlights evidence that some at-risk people are trapped in a process of

cumulative vulnerability where climate risks can result in loss of income due to reductions in crop yield and death of livestock, increases in food insecurity, loss of initial financial investment in farming, no access to compensation for loss of crops due to lack of legal recognition as a farmer in revenue laws or in the relief code, and MGNREGS implementation irregularities (such as non-payment of wages, partial or delayed payments) act as a barrier to accessing wages when they need it most (see Box 1).

Some participants indicated that the difficulties encountered in getting payment for work meant that some men were not interested in working on MGNREGS and instead worked in nearby towns and cities where payment for work is regular and on time. Clearly, the most vulnerable households cannot afford to deal with non-payment of wages, partial payments and delayed payments – even short delays – particularly as they participate in MGNREGS to meet the needs of their daily consumption expenditure during times of adverse stresses and shocks (some climate-related and some not) (see Box 2).

BOX 1. A SNAPSHOT OF THE INTERCONNECTED PROBLEMS OF POVERTY, CLIMATE RISK AND COVID-19 EXPERIENCED IN THE 'EVERYDAY' LIFE OF PLACES IN RURAL INDIA

"There is no work here in the village. No regular work is available for us. We have [one to] two bigha¹¹ of land, from [such] small land we cannot earn enough to raise our families. Our children cannot survive [on that]. Unlike Raaja¹² and Babhans¹³ in the village, our children did not [go to school]. We are not educated much. [We] want to educate our children so they can get better options but there is no money. We have to work on other [people's] farms, on farms of the Babhans. Our children [do too]. The earnings from these works [are] not even enough to secure food for our family [for the] day. We are just managing. Some of the large landowners give us land on bataiya.¹⁴ Whatever is harvested, we keep our share and remaining is given to the landowner. If there is drought, whatever we grow is destroy[ed]. Drought happened two years back. As the land is not ours, we do not get anything. [We] are not given any compensation by the government, [nothing] from the drought relief fund. All the relief is given to the landowners [...]. MGNREGS work started immediately [after the drought], but we have not received the money yet. There is not much work under MGNREGS; the work comes for three to four weeks in a year. It is not enough to sustain a family. We worked in May–June [2020], after two months we got [some] money. We worked for 12 days but we only got six days' wage. The rest is still not paid to us. [We were told]: money will come, money will come. We worked in expectation. Everyone has stomach. How [do we] feed [ourselves] and survive on assurances? It has been a year of Coronavirus [...]. We are in more trouble. It has become difficult to feed our families. There has been [less] work."

(#1 female group interview, Banda district, 12 January 2021)

¹¹ Bigha is a unit of land measurement in India. There is no standard value attached to it, it varies from state to state. One bigha is approximately equivalent to 0.62 acres in Uttar Pradesh, 0.27 acres in Madhya Pradesh, and 0.62 acres in Rajasthan.

¹² Raaja is the term used in Hindi-speaking states to describe people belonging to wealthier and land-owning upper caste families.

¹³ Babhan, also known as Bhumihaar, are land-owning Brahmins. Brahmin is the highest caste in India.

¹⁴ Bataiya is an informal land leasing system under a sharecropping agreement where the tenant provides half of the crop to the landowner. All the investment in the farm is borne by the tenant and the landowner does not provide financial input for the improvement of land or production of the crop.

BOX 2. DELAY IN WAGE PAYMENTS

“Some delay in the payment is always there. We are [poor] so delaying paying us even for a week throws us into a [worse situation] day by day. We do not know where to raise the complaint. We told the Gram Rojgar Sevak [village level part-time worker assisting in the management of the programme] about it, but then he told us that he will inform us [when the payment is made]. Once I told the Pradhan [village head] about this, but he also said the same. There is nothing we can do; we wait for our money. There is no one to hear our complaint.”

(#4 female group interview, Mahoba district, 16 January 2021)

#4 female group interview highlights a common issue raised, namely women workers' lack of awareness of their legal entitlements under the programme and the inadequacy of grievance redressal under MGNREGS. It is unclear whether participants received compensation for wages paid more than 15 days after the work being done, as per the Payment of Wages Act. Furthermore, participants reported that late payments led to households adopting negative coping strategies, including relying on informal credit¹⁵ until they were paid and engaging in distress migration to manage climate and non-climate risk because they are poor and have few savings to use for alternative coping strategies. These dysfunctions in MGNREGS' implementation highlight the need for shock-responsive wage payments that are accurate, timely and predictable, including anticipatory wage payments that use long-range monsoon forecasts or remote sensing data to improve preparedness by providing households with wage payments before a drought, dynamic wage rates based on drought and heat stress forecasts to provide households with higher daily wage payments during drought or extreme heat shocks, and streamlined shock-responsive drought declaration payments that use remote sensing drought indices to trigger faster additional MGNREGS wage days to households when drought occurs (Steinbach et al., 2020).

4.2 Distribution of benefits from asset creation

Some scholars argue that the construction of infrastructure under MGNREGS, such as micro-irrigation projects, check dams and wells, can help reduce exposure to certain types of climate risk and can contribute to sustainable livelihood opportunities (Esteves et al., 2013; Fischer, 2020; Godfrey-Wood and Flower, 2018). Indeed, participants' comments suggest that MGNREGS has helped reduce vulnerability to climate shocks (albeit to a limited extent) through the construction of assets intended to support the livelihood activities of wage seekers, however only participants of #8 female group interview reported directly experiencing such benefits themselves. They explained that farm bunds (retaining walls along the boundary of agricultural fields) constructed under MGNREGS have helped contain rainwater in the field, increasing soil moisture. Although this is likely to improve soil quality and reduce erosion, participants explained the need for additional infrastructure to reduce livelihood vulnerability to drought, uncertain and low rainfall, and low groundwater availability, and to improve drinking water availability. Many other study participants highlighted that water structures constructed under the scheme, such as ponds, could have reduced the drudgery of women by reducing the time spent collecting water, but due to low rainfall, most of the structures are dry for many months in the year.

Clearly, the construction of assets that have the potential to insulate productive systems from climate fluctuations is not without merit, though the comments from #5 female group interview highlight a critical question: who benefits from assets created under MGNREGS (see Box 3)? This question draws attention to the potential pitfalls of creating individual assets that only benefit landowners without constructing local public goods to provide community-wide benefits in dealing with climate-related risks. Since the 2015–2016 fiscal year, more than 60 per cent of expenditure on assets has been on agriculture and allied activities (MoRD, n.d.), suggesting that the benefits of the scheme mostly favour landowners (albeit potentially also benefiting workers on their farms) as landless rural labour households are excluded from the benefits by default (see Pankaj, 2017).

¹⁵ See Jordan (2021) for an in-depth examination of the role of informal credit in contributing to maladaptive outcomes and negative lock-in effects.

BOX 3. UNEVEN DISTRIBUTION OF BENEFITS FROM ASSET CREATION

"They say there is little work, so they give it to men. We get work for 15 days in a year at the most. Normally MGNREGS work in the village is done by contractors. They bring their own labourers. They do not call the village people for doing work, they do not call us. MGNREGS should be implemented properly so that we get work [...]. We did the work at the time of construction of the well. It is very far away; the well is constructed near the farms. Water scarcity is huge [problem here]. All the handpumps get dry in summer. Normally we bring the water from the river. We have no option, so we have to do this. [There is a] dam in the village but it is not nearby. The dam water goes to a farm, in another village."

(#5 female group interview, Barwani district, 20 January 2021)

Participants reported that benefits from asset creation are often uneven, this is in part due to gender-related social norms that influence what is perceived as 'appropriate' work for women (e.g., road work was not available to women, #5 female group interview). Despite MGNREGS' gender-sensitive design, the study found that older women do not participate in MGNREGS work in the case study villages, with respondents highlighting that the nature of the work favours able-bodied people. Pregnant women also do not work (as reported by all participants that were questioned on this topic), with some highlighting that families would not allow that. This suggests a lack of implementation of the MGNREGA's operational guidelines, which recognise the vulnerabilities and needs of women at different stages of their lifecycle, such as the provision of less arduous work during pregnancy and in older age (Chopra, 2019b). These dysfunctions in MGNREGS implementation as well as social norms reduce the ability of women (particularly older woman and pregnant women) to access wages during times of climate and non-climate-related risk.

Furthermore, the case study found that circuits of control and power at the local level can act to reproduce exclusion and injustice within the village, with many reporting that there had been cases of doctoring job cards and muster rolls to include contractors and workers that do not have job cards. Participants explained that sometimes work is completed by

contractors connected to local elites (such as the Pradhan and mates) that bring workers from elsewhere and/or use machinery. There were also cases of women working on someone else's job card for 50 per cent of the wage rate with the job card holder retaining the rest. This may be another factor explaining some of the delays in wage payment, in other words, the delay in wage payment in such cases could be in part due to the job card holder deciding to pay the worker late. These exploitative patron-client relationships act as a barrier for MGNREGS to address climate vulnerabilities through fostering livelihood security via the provision of wage labour.

4.3 Unpaid care work responsibilities

Though climate change impacts increase the productive workloads of both men and women, numerous studies have found that women also bear the brunt of increased unpaid care work responsibilities (Jordan, 2019; Muthoni and Wangui, 2013; Resurrección, 2013). Women have a disproportionate share in unpaid care work responsibilities, which increases their drudgery, deepens their time poverty, and has a negative impact on their ability to participate in MGNREGS work (Chopra, 2019a). Women workers often must get up early to cook food, collect firewood and fetch water before going to the worksite, and other females in the household often take on additional household chores to support those that go to work. Previous sections highlighted that some women experience additional domestic responsibilities because of male outmigration in response to falling agricultural income due to reductions in crop yields caused by drought.

Women with young children face a set of challenges that other groups of women do not. Many women with young children lacking access to childminding support within the home were either unable to participate in MGNREGS work or instead they brought their children to the worksite despite the absence of functioning crèche facilities, thus facing the added stress of having to balance the demands of their work with childcare responsibilities. In contrast, some women who have childcare support reported that they return home during their lunch break to attend to the needs of their children being cared for by other family members, usually their mothers-in-law. Hence, irrespective of age, women are responsible for unpaid care work, and participation in MGNREGS can deepen the time poverty of not only women workers but also older female relatives too.

Furthermore, the study found that MGNREGS' focus on improving women's labour force participation without adequate recognition of their unpaid care work responsibilities can also lead to older children being pulled out of school to take on care responsibilities of younger siblings when their mothers go to the MGNREGS work site for employment. Though there was no clear gender dimension found in this practice, previous research carried out as part of the ICRG programme found that girls were more likely to be pulled out of school to take on domestic responsibilities. Although this practice is not prevalent in the case study villages, it may lead to a decline in the educational attainment of children who shoulder the burden of domestic responsibilities and exacerbate their vulnerability. Indeed, numerous studies argue that lack of access to education and low levels of attainment are a constraint that contributes to hazard exposure and vulnerability to climate and non-climate-related risks (Noble et al., 2014; Paavola, 2008).

Participants reported that conditions such as erratic rainfall, heat extremes and drought have a disproportionate negative impact on their lives because of their domestic responsibilities. For example, women and girls have primary responsibility for household water supply, as fetching water is seen as a feminised task. Many women reported that the time spent collecting water is already arduous under current climate conditions. This is likely to increase under future climate change scenarios (see Table 1) with no intervention. Previous research carried out as part of the ICRG programme highlighted that the challenges females experience in fetching water are intensified by socio-cultural norms preventing them from touching the tube well or water sources during menstruation. This not only increases their dependency on others, but also increases their workload, as they often have to travel longer distances to collect water from the limited water sources they are permitted to touch.

Women and girls' unpaid care responsibilities are further exacerbated by the lack of provision of safe drinking water at worksites, with participants in only four out of the 12 focus group discussions (#7, 9, 10 and 12) reporting that water was provided, resulting in all other women (and their daughters) having to manage their own water needs at the worksites, in addition to all male members of their households. Clearly public works that reduce the time and effort of fetching water would be beneficial for women, especially under future climate change scenarios across all of the study districts (see Box 4).

BOX 4. CHALLENGES OF COLLECTING WATER IN THE FACE OF CLIMATE RISK

"We have to struggle a lot [to get] water, it is more difficult in summer [...]. It does not rain much here. There are only two tube wells on the other side of the road, but the tap is damaged in one, it has not been repaired. There is a huge queue to fetch water. We spend hours getting water every day. We have done boring three times but still no water has come out. You need water for everything. You cannot live without it. We are anxious about water. They have built this pond [under MGNREGS] so if the rain comes then the water would collect there, but it remains dry most of the year. If it does not rain, then how will the pond have water? What is the use of making it if it is still empty and the problem of water is not solved? We have seen this for so many years. We need a drinking water facility. Pradhan does not listen to us much; he should consider all the people's needs."

(#4 female group interview, Mahoba district, 16 January 2021)

4.4 Implementation and monitoring of gender-sensitive provisions

Previous sections have established that a lack of implementation of the MGNREGA's operational guidelines and inadequate recognition of the needs of different groups of women at the workplace limits MGNREGS' ability to act as a buffer against climate risks for different groups of women. Similar to other studies (e.g. Chopra, 2019; Singh and Datta, 2019; Vij et al., 2017), the case study found that most of the participants were unaware of the different provisions under the MGNREGA, childcare facilities at worksites were non-existent, there was lack of awareness of whether first aid boxes were available, safe drinking water was routinely not provided at most of the worksites, no shaded areas for children were provided, and periods of rest when women are not required to return home were also not provided. These challenging work conditions were further heightened by the difficulty of working during times of extreme heat, which is likely to slow down work productivity. Studies have found

that some people are especially vulnerable to heat stress, such as those working outdoors, older people and women. In particular pregnant women exposed to extreme heat have a higher risk of stillbirth (Vincent et al., 2014; Watts et al., 2021; Zhang et al., 2017). Further research is required to understand whether the SoR takes account of current and future climate conditions projected for the case study locations, for example if a district's mean temperature is higher than the state average, is the SoR altered, given the likely connection to work productivity, and does it take account of differential vulnerability to extreme heat?

However, all women indicated that safe working conditions were provided at the worksites and unlike previous research carried out as part of the ICRG programme, all interviewees (except one woman) reported that the absence of their husband to work did not prevent them from participating in MGNREGS as they were able to work with other women and men at the worksite (all men at the worksite were known to them). Further research is required to understand, whether the SoR is gender sensitive (see Figure 2).

Lack of implementation of gender-sensitive provisions are not only blatant violations of the MGNREGA, but a missed opportunity to improve women's access to wages during times of climate and non-climate-related stress. Improved implementation of these provisions would also better support women in balancing their paid work with their unpaid care work responsibilities, especially during times of climate risk when their unpaid care work responsibilities are typically higher. Previous sections drew attention to the lack of participation of pregnant women and older women; these women (as well as other special categories of women specified in the MGNREGA) could staff crèche facilities and provide drinking water at the worksites.

Although, the MGNREGS MIS was introduced to promote transparency and efficiency of programme implementation, it does not provide any data on the implementation of worksite facilities or gender-sensitive provisions of the MGNREGA except for women's workforce participation. Although it measures women's workforce participation as well as some other social groups (e.g., Appendices 6 to 8), it does not capture how gender intersects with other categories of difference to influence participation rates for different groups of women (for example percentage of women scheduled caste workers). There is a need to collect additional disaggregated data in the MIS that recognises the differential impacts (intended and

unintended) of the programme by gender and other identity markers to develop a robust evidence base to improve programme effectiveness for different groups of women.

4.5 Bargaining power and control in decision-making

MGNREGA's community-based planning architecture has the potential to provide channels for women and other at-risk people to raise concerns and make demands, and to influence planning processes on the type and location of assets constructed under the scheme to help reduce exposure to climate risks and contribute to sustainable livelihood opportunities (Fischer, 2020; Godfrey-Wood and Flower, 2018). Its decentralised planning architecture aligns with a growing emphasis on locally driven adaptation to climate change, an approach that can help ensure that climate interventions are grounded in local context, adapted to local priorities and needs, and are more effective (Amundsen et al., 2018; Forsyth, 2013; Melo Zurita et al., 2018; Rühlemann and Jordan, 2019)

The projects undertaken are to be decided by each Gram Panchayat¹⁶ in meetings of the Gram Sabha and the Ward Sabha through a process of decentralised participatory planning. In each village, an action plan must be prepared in the Ward Sabha and the projects identified are assigned priority (MoRD, 2013). All identified projects are then presented at the Gram Sabha meetings where works are prioritised for implementation (MoRD, 2013). The village council is mandated to meet at least two to four times a year,¹⁷ with MGNREGS being one of the main programmes to be discussed (see Figure 4). The usefulness of the selected MGNREGS works is considered to be higher if it is done through the Gram Sabha, which includes government representatives and the local community including workers (Pankaj, 2017). However it is important not to assume that local organisations are always more responsive to the needs of at-risk people, as they can be politicised, bureaucratic and staffed by local elites (Karim, 1999, cited in Mohan and Stokke, 2000; Rühlemann and Jordan, 2019).

Lack of bargaining power and control in decision-making, under-valuation of women's opinions and lack of confidence are identified as social barriers for women to cope with and adapt to climate risks (Codjoe et al., 2012; Djoudi and Brockhaus, 2011; Jordan, 2019).

¹⁶ The MGNREGA has made a provision that 50 per cent of works shall be implemented by Gram Panchayats.

¹⁷ This varies across states, with each deciding the number of meetings according to their State Panchayati Raj Acts and State Panchayati Raj Rules. According to the State Gram Panchayat Act of the three states, the number of Gram Sabha meetings that are mandatory each year include: two meetings in Rajasthan, four meetings in Madhya Pradesh and two meetings in Uttar Pradesh.

Figure 4. Responsibilities of the Gram Sabha under the MGNREGA

The Gram Sabha is the principal forum for wage seekers to raise their voices and make demands. The Gram Sabha has the following rights and responsibilities under the MGNREGA:

- It recommends works to be taken up and is the final authority to determine the order of priority in which works will be initiated under MGNREGA.
- It monitors the execution of works within the Gram Panchayat.
- It is the primary forum for conducting social audits. It provides a platform for all residents to seek and obtain all relevant information from all the implementing agencies, including Gram Panchayat, in relation to MGNREGA works implemented in the Gram Panchayat area.

Note: The Ward Sabhas have similar functions as the Gram Sabha.

Source: MoRD (2013, p6)

Despite the 73rd Amendment to the Indian Constitution stipulating that one third of representation within the Panchayat system should be women, decision-making is male dominated. Previous sections have established that a large number of women participate in MGNREGS as workers, but the study found that their participation in decision-making on planning and implementation of MGNREGS and social monitoring is non-existent.

The vast majority of respondents said that they do not attend Gram Sabhas because they are not informed of the meetings, are not welcome, are overburdened with unpaid care work responsibilities, are adhering purdah norms,¹⁸ the distance to the meeting venue (gram panchayat bhawan) is too great, or they think that they have little contribution to make. Women from migrant households face additional challenges in this context, as their husbands and other male members of the household are unable to attend Gram Sabha meetings. In contrast, previous research carried out as part of the ICRG programme, found that the attendance of women at Gram Sabha had increased in some places as women SHG members had been invited. Although some women in the present study did report that they have attended Gram Sabhas, their participation was significantly reduced by gender-specific ideologies surrounding socio-cultural norms. Women (albeit less so for older women) often feel uncomfortable speaking in public in the presence of men (especially elder men) as it is viewed negatively: “it is seen as bad if we were to speak” (#11 female group interview).

Despite it being mandated for Gram Sabha to meet at least two to four times a year, a small number of participants reported that it had never been organised in their village. Critically, no interviewees attended or were aware of any Gram Sabha held to select the type and location of MGNREGS works; this finding is significant, as it highlights that women have no opportunity to articulate their views on the type and location of assets that would help meet their priorities and needs in the face of climate risk, such as reducing the load of unpaid work like fetching water (see Box 5).

BOX 5. LACK OF PARTICIPATION OF WOMEN IN DECISION-MAKING ON MGNREGS PLANNING PROCESSES

“We never attend [Gram Sabha] meetings, women do not go. We are never called, that is why we never attend such meetings. Maybe he only informs [those] close [to him]. No one tells us anything. How will we go there? It is far from here. Some [men] go and few do not go because of distance. Our husbands are not in the village, so they never go [...]. We do not get to know anything. They decide amongst themselves [about MGNREGS works], no one else is involved. We have nothing, no boring was made, no tube wells, the tap is not connected, there is no facility here to store more water [and], we need to have irrigation facility. There is a pond, [but] it dries out very quickly, if we [could] pave the base of it then we can get water for longer. If closed [tanks were made], water will remain stored for a year. I think that [would] help us. We store rainwater in open tanks, sand falls into it, so we sieve it through dupatta (scarf-like cloth worn by women). What else can we do. [That water lasts] around four months. If [your] family is big then it will end in three months. When it is finished, we buy water in a tank; we pay 500 rupees per tanker (approximately US\$6.73 or £4.84). But it only lasts five [to] ten days, we cannot afford to buy tanker all the time. What can we do? [No one] listens to us. Women here do not say much. We are [on] the outskirts, who will call us to [Gram Sabha]? Mukhiya [village head] is doing nothing for our problem. Rich person gets every facility, and all kind of benefits and the poor get nothing.”

(#10 female group interview, Jodhpur district, 27 January 2021)

¹⁸ Purdah is a social practice that involves the seclusion of females from public view; it places restrictions on females, ranging from limiting interaction between females and males outside certain well-defined categories, restriction on women's mobility outside of the home, to wearing a veil.

More broadly, the study found no evidence that women gaining employment and earning wages through MGNREGS translated into those women gaining improved bargaining leverage within the household or a change in gender relations in the household. Most women in this study did not have the autonomy to spend their earnings without seeking permission from their husband and/or in-laws, though some women explained that they did not have to seek permission to purchase specific types of items, such as medicine. Similarly, participants reported that they had to get permission from their husband and sometimes in-laws to participate in MGNREGS work: “I cannot go anywhere without asking him, not even to work” (#4 female group interview). Though further research is required to

understand whether women workers have greater say in household decision-making on a range of aspects, such as access and distribution of resources, division of labour, mobility, reproductive choices, and health and wellbeing, it is well documented in the literature that social exclusion from decision-making processes and labour markets makes women less able to deal with climate risks (Djoudi and Brockhaus, 2011; Jordan, 2019). Studies have documented how much women’s ability to respond to climate risk is influenced by access to and control over money and land, good health and wellbeing including sexual and reproductive health, low dependency ratios, personal mobility, and household entitlements (Jordan, 2019; Lambrou and Piana, 2006; Mayhew et al., 2020; Mehar et al., 2016).

5

Conclusion

This paper set out to examine the potential role of MGNREGS to reduce women's vulnerability to climate risks, through a qualitative study in Uttar Pradesh, Rajasthan and Madhya Pradesh. Though MGNREGS has a raft of gender-sensitive provisions in its design as well as provisions that were not made exclusively for women but have the potential to be beneficial for them in the face of climate risk, the implementation and monitoring of these provisions is limited. This does not mean that MGNREGS does not improve living standards for women, its requirement that one third of work placements should be reserved for women has led to women participating in high numbers across rural India. However, the findings establish that although MGNREGS provides livelihood opportunities (albeit limited), it largely only provides women with forms of support that have the potential to act as a safety net during times of stresses and shocks (some climate-related and some not), and therefore fails to offset the ongoing impacts of climate risk in the villages studied, let alone those of future climate change. This limitation is due to: (1) lack of livelihood security via the provision of wage labour (including dysfunctions in MGNREGS' implementation, such as inadequate number of workdays, non-payment of wages, partial payments and delayed payments), (2) uneven distribution of benefits from asset creation, (3) unpaid care work responsibilities, (4) lack of implementation and monitoring of gender-sensitive provisions and worksite facilities, and (5) lack of bargaining power and control in decision-making on planning and implementation of the programme.

5.1 Policy recommendations and lessons

Considering these five interconnected factors that limit MGNREGS' potential to reduce women's vulnerability to climate risk, key priority areas for action include (drawing on Holmes and Jones, 2011; Jones et al., 2010; Pereznieta and Holmes, 2020; Steinbach et al., 2020; UNICEF 2020; Zaidi et al., 2017):

1. Develop women's skills and occupational training in the non-farm sector to reduce dependence on climate-sensitive economic activities.
2. Provide climate-responsive wage payments that are accurate, timely and predictable, including anticipatory wage payments, dynamic wage rates, and streamlined shock-responsive drought declaration payments.
3. Develop gender awareness training for implementing staff at all levels to ensure the effective implementation of the gender-sensitive provisions stipulated in the MGNREGA, as well provisions that were not made exclusively for women but have the potential to be beneficial for them in the face of climate risk.
4. Coordinate community awareness-raising activities on the entitlements and rights provided for in the scheme and grievance mechanisms, particularly gender-related dimensions.

5. Develop training and awareness-raising campaigns on gender equality and women's rights for MGNREGS workers and the wider community with a particular focus on engaging men to influence positive gender outcomes (e.g., improving women's bargaining power in household decision-making).
6. Promote women's active engagement in designing, planning and monitoring of MGNREGS works through the Gram Sabha and social audit processes with set quotas for women's representation, as well as an emphasis on the inclusion of different groups of women, given that their views on the location and type of assets that would help meet their priorities and needs in the face of climate risk are influenced by multiple and intersecting social categorisations.
7. Champion women's participation in community decision-making through adopting a range of supporting provisions: flexible meeting timings that are compatible with women's roles and responsibilities; consultation with different groups of women on suitable meeting venues and meeting times, including a recognition of potential safety concerns; and transport to meetings if there is a need.
8. Create an enabling environment where women feel confident and supported in making substantive inputs in decision-making, especially in contexts where women are not usually heard. This would involve a range of mechanisms to build confidence, such as convening women-only meetings prior to the Gram Sabha to help them to express their views with the support of 'Gender Champions' (similar to the Climate Champion programme in Uganda, USAID, 2016).
9. Establish flexible working hours that recognise the vulnerabilities and needs of women at different stages of their lifecycle, including women's unpaid care responsibilities, regular breastfeeding breaks for women with young children, and the provision of suitable facilities for women to breastfeed.
10. Utilise SHGs to develop an exchange visit programme between MGNREGS projects aimed at sharing best practices in creating gender-responsive and climate-resilient infrastructure (e.g., labour-saving water harvesting, storage and irrigation systems) and enabling women to network.
11. Re-design the MGNREGS MIS to improve programme effectiveness for different groups of women in the face of climate risk. Collect additional disaggregated data (quantitative and qualitative) in the MIS that recognises the differential impacts of the programme by gender and its interaction with other identity markers (such as caste, age, pregnancy, lactation and marital status), including for example:
 - Climate-related benefits of assets created (including intra-household inequalities in the distribution of benefits)
 - Tracking of climate- and gender-related adjustments to the SoR
 - Level of participation in decision-making on the type and location of assets and engagement in social audits
 - Budget allocations and expenditure on gender-specific provisions (e.g., capacity-building for women)
 - Workforce participation rates that capture how gender intersects with other categories of difference
 - Use of grievance mechanisms, types of complaints filed and mechanisms for addressing issues raised, and
 - Changes in behaviour and attitudes around gender equality in the household (e.g., intra-household decision-making and behaviour, access to assets and resources, gender division of labour).

Although it is important to recognise women as agents capable of tackling climate change, caution is required: there is a danger that presenting women as 'solution providers' (or caretakers) for climate change shifts the burden of responsibility and workload to women, thereby reinforcing inequalities (Jordan, in press).

5.2 Future research

Given this pilot study focused exclusively on women, there are knowledge gaps that need to be addressed with a tailored gender and intersectional analysis (including gender minorities). The next phase of ICRG provides an opportunity to generate an evidence base that is focused on strengthening the gender-responsiveness of MGNREGS and setting in place pathways towards achieving gender transformative climate change adaptation.

Priority questions for future research include:

How do socio-cultural contexts and power axes of social differentiation influence how at-risk people are impacted by climate change and their associated coping and adaptive strategies? A risk and vulnerability assessment identifying the fundamental root causes as to why different groups of at-risk people (women, men, girls, boys and gender minorities) experience different vulnerabilities to climate change. This will provide a solid basis for MGNREGS and complementary interventions to address and combat the differentiated impacts of climate risks. Such analysis would examine what it means to build resilience for different groups of at-risk people, specifically how it is shaped by intersecting identity markers.

Is MGNREGS designed to respond to the differences in vulnerability to climate risks driven by gender and other intersectional vulnerabilities? Do MGNREGS delivery mechanisms hold up in crisis contexts, and are they gender-responsive? Does this vary for different types of climate-related risks?

Are there synergies with relevant policies on climate change, disaster risk reduction and gender equality at the regional and national level?

Ensuring policy linkages is critical for ensuring national programmes fit within a coherent policy framework and complement gender equality policies and approaches at regional and national levels (Perezniето and Holmes, 2020). This would specifically build on recent policy analysis (Singh et al., 2021) that found gaps exist between normative goals, such as reducing differential vulnerability and empowering women, and policy approaches in most of India's State Action Plans on Climate Change.

In conclusion, MGNREGS should not only provide strategies that allow at-risk people to survive climate risks, but also enable them to thrive despite climate risks and the uncertainty that it brings. This is particularly important when climate impacts deepen women's time poverty and concerns about care responsibilities, which are already stressful in current climate conditions.

In this context, climate change adaptation requires moving towards a more radical, transformational and gender-sensitive dimension that has the potential to deal with the fundamental root causes as to why at-risk people are vulnerable in the first place (Jordan, 2019). A failure to do so risks further reinforcing vulnerabilities. The implication is that MGNREGS itself needs to adapt; there is a need for innovative provisions that purposefully challenge unequal gender relations and the structural and root causes of discrimination.

Appendices

Appendix 1. Alternative research strategies: COVID-19 environment

An in-depth multi-method qualitative study was planned for this research pre-COVID-19, to allow the development of in-depth and rich accounts of women's gendered experiences of MGNREGS in the face of climate risk. However, attempting to conduct in-depth and time-intensive research with a large number of women that have experienced vulnerability, deprivation and trauma was viewed as inappropriate in the current context, given that participating in the research may put an unnecessary burden on women who might be in distress during the pandemic. Although there are other options to virtually replicate the face-to-face interview or focus group discussion (e.g., video calling) this was not suitable for this study for a range of reasons, including, for example: participants not being able to use the technology, poor WIFI connections, and more critically, significantly limiting the ability of the researchers to build rapport and trust with study participants, which is paramount for carrying out qualitative, participatory research. Instead, primary data collection was significantly downscaled to a small-scale, preliminary study that involved carrying out a total of 12 focus group discussions (with the duration significantly shortened) with a small number of women across three states, with COVID-19 protocols strictly adhered to.

Appendix 2. Pilot study locations

GROUP INTERVIEW NUMBER	STATE	DISTRICT	BLOCK
1	Uttar Pradesh	Banda	Badokhar Khurd
2	Uttar Pradesh	Banda	Naraini
3	Uttar Pradesh	Mahoba	Panwari
4	Uttar Pradesh	Mahoba	Jaitpur
5	Madhya Pradesh	Barwani	Pansemal
6	Madhya Pradesh	Barwani	Niwali
7	Madhya Pradesh	Alirajpur	Sondwa
8	Madhya Pradesh	Alirajpur	Alirajpur
9	Rajasthan	Jodhpur	Balesar
10	Rajasthan	Jodhpur	Shergarh
11	Rajasthan	Barmer	Baytoo
12	Rajasthan	Barmer	Dhorimanna

Appendix 3. Average days of employment provided per household in Uttar Pradesh pilot study districts and blocks

FISCAL YEAR			BANDA DISTRICT		MAHOBA DISTRICT	
	BANDA DISTRICT	MAHOBA DISTRICT	BADOKHAR		PANWARI BLOCK	JAITPUR BLOCK
			KHURD BLOCK	NARAINI BLOCK		
2013–14	38.02	37.62	41.11	36.89	35.83	40.12
2014–15	39.06	26.10	39.79	38.88	23.18	31.76
2015–16	40.61	32.61	42.63	40.59	28.91	35.77
2016–17	36.76	32.37	36.86	38.95	28.54	36.16
2017–18	42.04	36.25	37.93	40.64	35.15	37.95
2018–19	44.54	40.88	47.96	45.56	40.02	42.67
2019–20	52.27	49.91	53.86	51.05	51.35	54.91
2020–21	42.40	42.52	43.05	44.81	42.76	45.39

Source: MoRD (n.d.)

Appendix 4. Average days of employment provided per household in Madhya Pradesh pilot study districts and blocks

FISCAL YEAR			BARWANI DISTRICT		ALIRAJPUR DISTRICT	
	BARWANI DISTRICT	ALIRAJPUR DISTRICT	PANSEMAL		SONDWA BLOCK	ALIRAJPUR BLOCK
			BLOCK	NIWALI BLOCK		
2013–14	27.35	41.07	27.78	24.89	38.75	43.27
2014–15	33.29	39.39	33.33	34.25	37.44	41.91
2015–16	35.07	42.02	32.50	30.96	42.62	37.68
2016–17	34.03	45.97	31.59	29.88	50.79	44.25
2017–18	39.40	41.5	36.91	38.29	50.52	39.38
2018–19	47.34	49.91	47.18	47.52	51.25	48.21
2019–20	52.25	53.78	50.46	49.22	56.07	51.49
2020–21	59.84	60.86	57.84	57.72	68.26	56.15

Source: MoRD (n.d.)

Appendix 5. Average days of employment provided per household in Rajasthan pilot study districts and blocks

FISCAL YEAR	JODHPUR DISTRICT	BARMER DISTRICT	JODHPUR DISTRICT		BARMER DISTRICT	
			BALESAR BLOCK	SHERGARH BLOCK	BAYTOO BLOCK	DHORIMANNA BLOCK
2013–14	57.18	61.16	49.15	40.49	79.49	58.85
2014–15	39.70	56.45	47.37	37.34	66.95	53.49
2015–16	55.03	60.43	64.60	51.47	69.33	55.56
2016–17	56.41	70.82	60.37	56.13	77.70	68.31
2017–18	52.1	61.11	62.58	56.95	72.47	63.45
2018–19	57.99	65.90	63.27	72.39	72.71	68.80
2019–20	60.98	63.57	64.27	67.26	69.31	63.14
2020–21	61.34	69.86	65.10	64.42	75.53	71.39

Source: MoRD (n.d.)

Note: some data was not able to be retrieved from MIS.

Appendix 6. Percentage of SC workers in MGNREGS

FISCAL YEAR	SC PERSON-DAYS OUT OF TOTAL (PERCENTAGE)									
	UTTAR PRADESH STATE			MADHYA PRADESH STATE			RAJASTHAN STATE			INDIA
	Uttar Pradesh	Banda district	Mahoba district	Madhya Pradesh	Barwani district	Alirajpur district	Rajasthan	Jodhpur district	Barmer district	
2013–14	35.08	29.88	28.31	17.21	13.95	25.29	19.85	20.35	19.23	22.80
2014–15	35.85	34.84	29.70	16.29	11.70	22.59	20.39	20.55	19.88	22.53
2015–16	35.96	33.19	28.47	16.18	8.88	20.64	21.50	20.55	19.09	22.45
2016–17	33.41	31.77	26.22	16.08	9.54	20.03	21.35	20.42	17.93	21.47
2017–18	34.07	32.18	31.79	16.74	11.55	18.28	21.08	20.22	16.45	21.56
2018–19	31.42	26.82	25.16	16.27	11.44	18.41	21.39	20.13	16.31	20.77
2019–20	30.43	23.45	22.41	14.51	10.89	16.76	20.85	19.65	16.01	20.38
2020–21	31.19	26.67	29.38	13.28	9.68	15.58	21.80	18.77	15.70	19.86

Source: MoRD (n.d.)

Appendix 7: Percentage of ST workers in MGNREGS

FISCAL YEAR	ST PERSON-DAYS OUT OF TOTAL (PERCENTAGE)									
	UTTAR PRADESH STATE			MADHYA PRADESH STATE			RAJASTHAN STATE			INDIA
	Uttar Pradesh	Banda district	Mahoba district	Madhya Pradesh	Barwani district	Alirajpur district	Rajasthan	Jodhpur district	Barmer district	
2013–14	1.03	0.07	0.11	32.74	69.86	68.74	26.17	3.52	7.37	17.50
2014–15	0.82	0.07	0.11	29.97	74.07	71.83	26.55	3.72	7.50	17.11
2015–16	1.08	0.08	0.08	34.37	77.16	74.16	24.35	3.73	7.39	17.83
2016–17	0.94	0.06	0.09	35.63	77.09	74.81	22.49	3.68	7.06	17.66
2017–18	0.95	0.17	0.14	31.59	74.33	76.26	21.48	3.63	6.28	17.49
2018–19	0.95	0.06	0.15	34.32	75.19	76.02	22.32	3.80	6.79	17.42
2019–20	0.95	0.05	0.11	33.30	75.56	77.92	22.13	3.63	5.80	18.51
2020–21	0.99	0.06	0.14	33.37	76.79	78.75	21.76	3.72	5.96	17.91

Source: MoRD (n.d.)

Appendix 8. Percentage of differently-abled workers in MGNREGS

FISCAL YEAR	DIFFERENTLY-ABLED PERSON-DAYS OUT OF TOTAL (PERCENTAGE)									
	UTTAR PRADESH STATE			MADHYA PRADESH STATE			RAJASTHAN STATE			INDIA
	Uttar Pradesh	Banda district	Mahoba district	Madhya Pradesh	Barwani district	Alirajpur district	Rajasthan	Jodhpur district	Barmer district	
2013–14	0.19	0.06	0.07	0.48	0.35	0.42	0.06	0.03	0.04	-
2014–15	0.19	0.05	0.04	0.61	0.40	0.65	0.07	0.04	0.05	-
2015–16	0.19	0.07	0.06	0.01	8.63	0.39	0.10	0.04	0.08	-
2016–17	0.19	0.07	0.07	0.89	0.66	1.22	0.14	0.09	0.11	-
2017–18	0.18	0.05	0.08	0.84	0.52	1.64	0.18	0.14	0.13	0.68
2018–19	0.17	0.05	0.05	0.80	0.52	1.49	0.20	0.14	0.14	0.64
2019–20	0.16	0.03	0.06	0.80	0.52	1.42	0.26	0.17	0.17	0.61
2020–21	0.15	0.05	0.07	0.76	0.49	1.30	0.02	0.01	0.02	0.91

Source: MoRD (n.d.)

Note: some data was not able to be retrieved from the MGNREGS MIS.

Acronyms

FTO	Fund transfer order
ICRG	Infrastructure for Climate Resilient Growth
IPCC	Intergovernmental Panel on Climate Change
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MIS	Management Information System (MGNREGS)
MoRD	Ministry of Rural Development
NAFCC	National Adaptation Fund for Climate Change
OBC	Other backward castes
SC	Scheduled castes
SHG	Self-Help Group
SoR	Schedule of rates
ST	Scheduled tribes

Related reading

Kajumba, T and Shakya, C (19 May 2021) Putting gender, intersectionality and social justice at the centre of transformative responses to climate change. <https://www.iied.org/putting-gender-intersectionality-social-justice-centre-transformative-responses-climate-change>

Kaur, N, Agrawal, A, Steinbach, D, Panjiyar, A, Sehgal, S, Manuel, C, Barnwal, A, Shakya, C, Norton, A, Kumar, N, Soanes, M and Venkataramani, V (2019) Building resilience to climate change through social protection: lessons from MGNREGS, India. IIED, London.

Steinbach, D, Soanes, M, Barrett, S, Venkataramani, V and Cheranda, TM (2020) Deepening knowledge of MGNREGS' contribution to climate resilience: A study of Rajasthan and Uttar Pradesh. IIED, London.

References

- Adam, HN (2015) Mainstreaming adaptation in India: The Mahatma Gandhi National Rural Employment Guarantee Act and climate change. *Climate and Development* 7(2) 142–152.
- Aiyar, Y and Samji, S (2009) Transparency and accountability in NREGA: a case study of Andhra Pradesh. Accountability Initiative Working Paper No. 1. Accountability Initiative, Centre for Policy Research, New Delhi.
- Amaral, S, Bandyopadhyay, S and Sensarma, R (2015) Public work programmes and gender-based violence: the case of NREGA in India. Indian Institute of Management Kozhikode Working paper IIMK/WPS/176/ECO/2015/12. Indian Institute of Management Kozhikode. Kozhikode.
- Amundsen, H, Hovelsrud, GK, Aall, C, Karlsson, M and Westskog, H (2018) Local governments as drivers for societal transformation: towards the 1.5°C ambition. *Current Opinion in Environmental Sustainability* 31 23–29.
- Arora V, Kulshreshtha L and Upadhyay, V (2013) Mahatma Gandhi National Rural Employment Guarantee Scheme: a unique scheme for Indian rural women. *International Journal of Economic Practices and Theories* 3 2247–7225.
- Beaman, L, Duflo, E, Pande, R and Topalova, P (2012) Female leadership raises aspirations and educational attainment for girls: a policy experiment in India. *Science* 335(6068) 582–586.
- Berg, E, Bhattacharyya, S, Rajasekhar, D and Ramachandra, M (2012) Can rural public works affect agricultural wages? Evidence from India. CSAE Working Paper WPS/2012-05. Centre for the Study of African Economies, Oxford.
- Bhatty, K (16 March 2008) *Falling through the Cracks*. The Hindu.
- Blaikie, P, Cannon, T, Davis, I and Wisner, B (1994) *At risk: natural hazards, people's vulnerability and disasters*. 1st edn Routledge, London.
- Borah, K and Bordoloi, R (2014) MGNREGA and its impact on daily waged women workers: a case study of Sonitpur district of Assam. *IOSR Journal of Economics and Finance* 4(4) 40–44.
- Business Standard (15 September 2019) Around 45,000 residents shifted from flood hit MP districts.
- Carr, ER, Fleming, G and Kalala, T (2016) Understanding women's needs for weather and climate information in agrarian settings: the case of Ngetou Maleck, Senegal. *Weather, Climate and Society* 8 247–264.
- Carr, ER and Thompson, MC (2014) Gender and climate change adaptation in agrarian settings: current thinking, new directions, and research frontiers. *Geography Compass* 8 182–197.
- Carswell, G and de Neve, G (2013) Women at the crossroads: implementation of employment guarantee scheme in rural Tamil Nadu. *Economic and Political Weekly* 48(52) 82–93.
- Chopra, D (2019a) Taking care into account: leveraging India's MGNREGA for women's empowerment. *Development and Change* 50(6) 1687–1716.
- Chopra, D (6 November 2019b) Gendering the design and implementation of MGNREGA. <https://www.unicef-irc.org/article/1934-gendering-the-design-and-implementation-of-social-protection-programmes.html>
- Codjoe, SNA, Atidoh, LK and Burkett, V (2012) Gender and occupational perspectives on adaptation to climate extremes in the Afram Plains of Ghana. *Climatic Change* 110(1-2) 431–454.
- Das, S and Mukherjee, D (2019) The impact of MGNREGS on child labour and child education: an empirical analysis. *Development in Practice* 29(3) 384–394.
- Devereux, S and Sabates-Wheeler, R (2004) Transformative social protection. IDS Working Paper 232. Institute of Development Studies, Brighton.
- Djoudi, H and Brockhaus, M (2011) Is adaptation to climate change gender neutral? Lessons from communities dependent on livestock and forests in northern Mali. *International Forestry Review* 13(2) 123–135.
- Eckstein, D, Künzel, V and Schäfer, L (2018) Global climate risk index 2018. Who suffers most from extreme weather events? Weather-related loss events in 2016 and 1997 to 2016. German Watch, Bonn.

- Elmhirst, R and Resurrección, BP (2008) Gender, environment and natural resource management: new dimensions, new debates. In: Resurrección, BP and Elmhirst, R (eds). *Gender and natural resource management: livelihoods, mobility and interventions*. Earthscan, London.
- Esteves, T, Rao, K, Sinha, B, Roy, S (2013) Agricultural and livelihood vulnerability reduction through the MGNREGA. *Economic and Political Weekly* 48(52) 94–103.
- Field, CB, Barros, VR, Mach, JM, Mastrandrea, MD, van Aalst, M, Adger, WN, Arent, DJ, Barnett, J, Betts, R, Bilir, TE, Birkmann, J, Carmin, J, Chadee, DD, Challinor, AJ, Chatterjee, M, Cramer, W, Davidson, DJ, Estrada, YO, Gattuso, J-P, Hijioka, Y, Hoegh-Guldberg, O, Huang, HQ, Insarov, GE, Jones, RN, Kovats, RS, Romero-Lankao, P, Larsen, JN, Losada, IJ, Marengo, JA, McLean, RF, Mearns, LO, Mechler, R, Morton, JF, Niang, I, Oki, T, Olwoch, JM, Opondo, M, Poloczanska, ES, Pörtner, H-O, Redsteer, MH, Reisinger, A, Revi, A, Schmidt, DN, Shaw, MR, Solecki, W, Stone, DA, Stone, JMR, Strzepek, KM, Suarez, AG, Tschakert, P, Valentini, R, Vicuña, S, Villamizar, A, Vincent, KE, Warren, R, White, LL, Wilbanks, TJ, Wong, PP and Yohe, GW (2014) Technical summary. In: Field, CB, Barros, VR, Dokken, DJ, Mach, KJ, Mastrandrea, MD, Bilir, TE, Chatterjee, M, Ebi, KL, Estrada, YO, Genova, RC, Girma, B, Kissel, ES, Levy, AN, MacCracken, Mastrandrea, PR and White, LL (eds). *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 35–94.
- Fischer, HW (2020) Policy innovations for pro-poor climate support: social protection, small-scale infrastructure, and active citizenship under India's MGNREGA. *Climate and Development* 12(8) 689–702.
- Forsyth, T (2013) Community-based adaptation: A review of past and future challenges. *Wiley Interdisciplinary Reviews: Climate Change* 4(5) 439–446.
- Godfrey-Wood, R and Flower, BCR (2018) Does guaranteed employment promote resilience to climate change? The case of India's Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). *Development Policy Review* 36(S1) O586–O604.
- Gol (2005) National Rural Employment Guarantee Act. *The Gazette of India*. Government of India, New Delhi.
- Gol (2011) Census data. Ministry of Home Affairs, Government of India, New Delhi. <https://censusindia.gov.in/2011-common/censusdata2011.html>
- Gol (2016) Report of the expert committee and model law on agricultural land leasing. NITI Aayog, Government of India, New Delhi. <http://www.niti.gov.in/sites/default/files/2020-05/Report-of-the-Expert-Committee-and-Model-Law-on-Agricultural-Land-Leasing.pdf>
- Gol (2019) Agriculture census 2015–16 (phase 1): all India report on number and area of operational holdings. Agriculture census division, Ministry of Agriculture and Farmers' Welfare, Government of India, New Delhi.
- Gol (2020) Food grain bulletin. Department of Food and Public Distribution, Ministry of Consumer Affairs, Food and Public Distribution, Government of India, New Delhi. <https://dfpd.gov.in/food-grain-bulletin.htm>
- Government of Madhya Pradesh (n.d.) The M. P. land revenue code, 1959 (M. P. Act No. 20 of 1959). Government of Madhya Pradesh, Madhya Pradesh. http://www.boardofrevenue.mp.gov.in/acts/Act_MPLRC_1959_0020_Pdf_F95_English.pdf
- Government of Madhya Pradesh (2014) Madhya Pradesh state action plan on climate change. Government of Madhya Pradesh, Madhya Pradesh.
- Government of Rajasthan (1955) Rajasthan Tenancy (Government) Rules, 1955: Part II Rules and Notifications. Government of Rajasthan, Rajasthan. [https://landrevenue.rajasthan.gov.in/content/dam/landrevenue/revenuedepartment/Rules/Rajasthan%20Tenancy%20\(Government\)%20Rules%2C%201955.pdf](https://landrevenue.rajasthan.gov.in/content/dam/landrevenue/revenuedepartment/Rules/Rajasthan%20Tenancy%20(Government)%20Rules%2C%201955.pdf)
- Government of Rajasthan (2011) Rajasthan state action plan on climate change. Government of Rajasthan, Rajasthan.
- Himanshu, AM and Sharan, MR (2015) The National Rural Employment Guarantee Scheme in Rajasthan: rationed funds and their allocation across villages. Effective States and Inclusive Development Working Paper 35. University of Manchester, Manchester.
- Hirway, I (2010) NREGA after four years: building on experiences to move ahead. *Indian Journal of Labour Economics* 53(1) 113–135.
- Holmes, R and Jones, N (2011) Gender inequality, risk and vulnerability in the rural economy: refocusing the public works agenda to take account of economic and social risks. ESA Working Paper No. 11-13. Food and Agriculture Organization of the United Nations, Rome.
- Huynh, PTA and Resurrección, BP (2014) Women's differentiated vulnerability and adaptations to climate-related agricultural water scarcity in rural central Vietnam. *Climate and Development* 6(3) 226–237.
- Indiastat (n.d.) District factbook. https://www.indiastatpublications.com/District_Factbook/

- International Labour Organization (2019) ILOSTAT database. The World Bank, Washington, DC. <https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?locations=IN>
- IPCC (2014) Climate change 2014: impacts, adaptation, and vulnerability. Part A: global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, CB, VR Barros, DJ Dokken, KJ Mach, MD Mastrandrea, TE Bilir, M Chatterjee, KL Ebi, YO Estrada, RC Genova, B Girma, ES Kissel, AN Levy, S MacCracken, PR Mastrandrea, and LL White (eds.)]. Cambridge University Press, Cambridge and New York.
- IPCC (2018) Summary for policymakers. In: Masson Delmotte, V, Zhai, P, Pörtner, H-O, Roberts, D, Skea, J, Shukla, PR, Pirani, A, Moufouma-Okia, W, Péan, C, Pidcock, R, Connors, S, Matthews, JBR, Chen, Y, Zhou, X, Gomis, MI, Lonnoy, E, Maycock, T, Tignor, M and Waterfield, T (eds). *Global warming of 1.5°C. An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. World Meteorological Organization, Geneva, Switzerland.
- IPCC (2021) Summary for policymakers. In: Masson Delmotte, V, Zhai, P, Pirani, A, Connors, SL, Péan, C, Berger, S, Caud, N, Chen, Y, Goldfarb, L, Gomis, MI, Huang, M, Leitzell, K, Lonnoy, E, Matthews, JBR, Maycock, TK, Waterfield, T, Yelekçi, O, Yu, R and Zhou, B (eds). *Climate change 2021: the physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. In Press.
- Indian Meteorological Department (2020) <https://mausam.imd.gov.in/>
- Jafino, BA, Walsh, B, Rozenberg, J and Hallegatt, S (2020). Revised estimates of the impact of climate change on extreme poverty by 2030. Policy Research Working Paper 9417. The World Bank, Washington, DC.
- Jenkins, R and Manor, J (2017) Politics and the right to work: India's National Rural Employment Guarantee Act. Oxford University Press, New Delhi.
- Jones, N, Tafere, Y and Woldehanna, T (2010) Gendered risks, poverty and vulnerability in Ethiopia: to what extent is the Productive Safety Net Programme (PSNP) making a difference. Overseas Development Institute, London.
- Jordan, JC (2019) Deconstructing resilience: Why gender and power matter in responding to climate stress in Bangladesh. *Climate and Development* 11(2) 167–179.
- Jordan, JC (2021) Climate shocks and adaptation strategies in coastal Bangladesh: does microcredit have a part to play? *Climate and Development* 13(5) 454–466.
- Jordan, JC (in press) Gender and sexual identities, resilience and vulnerability. In: Boyd, E (ed) *Routledge Handbook of Social and Ecological Resilience*. Taylor and Francis Ltd, London.
- Kamath, R (2010) National Rural Employment Guarantee Act: an effective safety net? *IIMB Management Review* 22(1–2) 42–55.
- Kareemulla, K, Ramasundaram, P, Kumar, S and Rama Rao, CA (2013) Impact of National Rural Employment Guarantee Scheme in India on rural poverty and food security. *Current Agriculture Research Journal* 1(1) 13–28.
- Kaur, N, Agrawal, A, Steinbach, D, Panjiyar, A, Sehgal, S, Manuel, C, Barnwal, A, Shakya, C, Norton, A, Kumar, N, Soanes, M and Venkataramani, V (2019) Building resilience to climate change through social protection: lessons from MGNREGS, India. IIED, London.
- Khera, R and Nayak, N (2009) Women workers and perceptions of the National Rural Employment Guarantee Act. *Economic and Political Weekly* 44(43) 49–57.
- Kolmannskog, VO (2009) Climate change, disaster, displacement and migration: initial evidence from Africa. Research Paper No. 180. United Nations High Commissioner for Refugees, Geneva.
- Lakha, S, Rajasekhar, D and Manjula, R (2015) Collusion, co-option and capture: social accountability and social audit in Karnataka, India. *Oxford Development Study* 43(3) 330–48.
- Lambrou, Y and Nelson, S (2013) Gender issues in climate change adaptation: farmers' food security in Andhra Pradesh. In: Alston, M and Whittenbury, K (eds). *Research, action and policy: addressing the gendered impacts of climate change*. Springer Science, Dordrecht, Netherland, 189–206.
- Mandal, S, Misra, GV, Naqvi, SMA and Kumar, N (2019) Situational analysis of agricultural land leasing in Uttar Pradesh. *Land Use Policy* 88 104–106.
- Manjula, R and D Rajasekhar (2015) Participation of Scheduled Caste households in MGNREGS: evidence from Karnataka. ISEC Working Paper 339. Institute for Social and Economic Change, Bengaluru.
- Mann, N and Pande, V (2012) MGNREGA Sameeksha: an anthology of research studies on the Mahatma Gandhi National Rural Employment Guarantee Act, 2005: 2006–2012 (ed. Shah, M). Orient Blackswan Private Ltd., Ministry of Rural Development, Government of India, New Delhi.

- Maplecroft (2011) Risk calculators and dashboard. <http://maplecroft.com/about/news/ccvi.html>
- Mayhew, SH, Newman, K, Johnson, D, Clark, E, Hammer, M, Mohan, V and Ssali, S (2020) New partnerships, new perspectives: the relevance of sexual and reproductive health and rights for sustainable development. *Health Policy* 124 599–604.
- McCord, A and Paul, MH (2019) An introduction to MGNREGA innovations and their potential for India Africa linkages on public employment programming. Deutsche Gesellschaft für Internationale Zusammenarbeit, Bonn.
- Mehar, M, Mittal S and Prasad, N (2016) Farmers coping strategies for climate shock: is it differentiated by gender? *Journal of Rural Studies* 44 123–131.
- Melo Zurita, MDL, Cook, B, Harms, L and March, A (2015) Towards new disaster governance: subsidiarity as a critical tool. *Environmental Policy and Governance* 25(6) 386–398.
- Mohan, G and K Stokke (2000) Participatory development and empowerment: the dangers of localism. *Third World Quarterly* 21(2) 247–268.
- Moosa, CS and Tuana, N (2014) Mapping a research agenda concerning gender and climate change: a review of the literature. *Hypatia* 29(3) 677–694.
- MoRD (n.d.) MGNREGS MIS. Ministry of Rural Development, Government of India, New Delhi. www.nrega.nic.in
- MoRD (2004) National Rural Employment Guarantee Bill. Ministry of Rural Development, Government of India, New Delhi
- MoRD (2005) Amendment to the National Rural Employment Guarantee Bill, 2004: Ex-post-facto approval of Cabinet. Ministry of Rural Development, Government of India, New Delhi
- MoRD (2007) Annual Report 2006-07. Ministry of Rural Development, Government of India, New Delhi.
- MoRD (2013) Mahatma Gandhi National Rural Employment Guarantee Act, 2005: operational guidelines. Ministry of Rural Development, Government of India, New Delhi.
- MoRD (2017) Mission Water Conservation under MGNREGS: an introduction. Ministry of Rural Development, Government of India, New Delhi.
- MoRD (2020a) Mahatma Gandhi National Rural Employment Guarantee Act, 2005: Annual Master Circular 2020–2021. Ministry of Rural Development, Government of India, New Delhi.
- MoRD (2020b) Social audit assessment index. Ministry of Rural Development, Government of India, New Delhi.
- MoRD (2021a) Annual budget outlays 2020–2021. Ministry of Rural Development, Government of India, New Delhi. https://rural.nic.in/sites/default/files/AnnualBudgetOutlay2020_21.pdf
- MoRD (2021b) Annual Report 2020–21. Ministry of Rural Development, Government of India, New Delhi.
- Muthoni, JW and Wangui, EE (2013) Women and climate change: strategies for adaptive capacity in Mwanga District, Tanzania. *African Geographical Review* 32(1) 59–71.
- Murty, CS and Reddy, MS (2020) Enriching the lives of marginalised sections: case of MGNREGS in composite Andhra Pradesh, India. *Journal of Development Policy and Practice* 5(2) 184–201.
- Nair, M, Ariana, P and Webster P (2014) Impact of mothers' employment on infant feeding and care: a qualitative study of the experiences of mothers employed through the Mahatma Gandhi National Rural Employment Guarantee Act. *BMJ Open* 4(4).
- Narayanan, S and Das, U (2014) Women participation and rationing in the employment guarantee scheme. *Economic and Political Weekly* 49(46) 46–53.
- Nelson, V and Stathers, T (2009) Resilience, power, culture, and climate: a case study from semi-arid Tanzania, and new research directions. *Gender and Development* 17(1) 81–94.
- Nightingale, AJ (2017) Environment and gender. *The International Encyclopaedia of Geography* 1–13.
- Noble, IR, Huq, S, Anokhin, YA, Carmin, J, Goudou, D, Lansigan, FP, Osman-Elasha, B and Villamizar, A (2014) Adaptation needs and options. In: Field, CB, Barros, VR, Dokken, DJ, Mach, KJ, Mastrandrea, MD, Bilir, TE, Chatterjee, M, Ebi, KL, Estrada, YO, Genova, RC, Girma, B, Kissel, ES, Levy, AN, MacCracken, S, Mastrandrea, PR and White, LL (eds). *Climate change 2014: impacts, adaptation, and vulnerability. Part A: global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 833–868.
- Norton, A, Seddon, N, Agrawal, A, Shakya, C, Kaur, N and Porras, I (2020) Harnessing employment-based social assistance programmes to scale up nature-based climate action. *Philosophical Transactions of the Royal Society B* 375(1794).
- Osbourne, N (2015) Intersectionality and kyriarchy: a framework for approaching power and social justice in planning and climate change adaptation. *Planning Theory* 14(2) 130–151.

- Paavola, J (2008) Livelihoods, vulnerability and adaptation to climate change in Morogoro, Tanzania. *Environmental Science and Policy* 11(7) 642–654.
- Pankaj, A (2017) Shift in MGNREGS from UPA to NDA. *Economic and Political Weekly* 52(33).
- Pankaj, A and Tankha, R (2010) Empowerment effects of the NREGS on women workers: A study in four states. *Economic and Political Weekly* 45(30) 45–55.
- Pattnaik, I, Lahiri-Dutt, K, Lockie, S and Prichard, B (2018) The feminization of agriculture or the feminization of agrarian distress? Tracking the trajectory of women in agriculture in India. *Journal of the Asia Pacific Economy* 23(1) 138–155.
- Pereznieto, P and Holmes, R (2020) Gender sensitivity analysis of the Sahel adaptive social protection programme. High-Quality Technical Assistance for Results, Oxford.
- Rao, CAR, Raju, BMK, Rao, AVMS, Rao, KV, Rao, VUM, Ramachandran, K, Venkateswarlu, B and Sikka, AK (2013) Atlas on vulnerability of Indian agriculture to climate change. Central Research Institute for Dryland Agriculture, Hyderabad.
- Ravera, F, Martín-Lopéz, B, Pascual, U and Drucker, A (2016) The diversity of fendered adaptation strategies to climate change of Indian farmers: a feminist intersectional approach. *Ambio* 45(3) S335–S351.
- Ravi, S and Engler, M (2015) Workfare as an effective way to fight poverty: the case of India's NREGS. *World Development* 67(C) 57–71.
- Resurrección, BP (2013) Persistent women and environment linkages in climate change and sustainable development agendas. *Women's Studies International Forum* 40 33–43.
- Rijkers, B and Costa, R (2012) Gender and rural non-farm entrepreneurship. Policy Research Working Paper 6066, Macroeconomics and Growth Team. Development research group, The World Bank, Washington, DC.
- Rühlemann, A and Jordan, JC (2019) Risk perception and culture: implications for vulnerability and adaptation to climate change. *Disasters* 45(2) 424–452.
- Sahoo, M (2014) Impact of MGNREGA on women empowerment: a case study of Cuttack district in Odisha. *Journal of Organization and Human Behaviour* 3(1) 44–50.
- Sainath, P (22 May 2007) No place for single women. *The Hindu*.
- Singh, K and Datta, SK (2019) Female participation in NREGA Programme: a comparative study of two backward districts in West Bengal, India. *The Indian Journal of Labour Economics* 62, 49–515.
- Singh, C, Solomon, D and Rao, N (2021) How does climate change adaptation policy in India consider gender? An analysis of 28 state action plans 2021. *Climate Policy* 21(7) 958–975.
- Sridhar, KS and Reddy, AV (2015) India's Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS): wages, reservation wages and programme participation in Chitradurga district of Karnataka. *Management and Labour Studies* 40(3–4) 366–384.
- Steinbach, D, Soanes, M, Barrett, S, Venkataramani, V and Cheranda, TM (2020) Deepening knowledge of MGNREGS' contribution to climate resilience: A study of Rajasthan and Uttar Pradesh. IIED, London.
- Sultana, F (2014) Gendering climate change: geographical insights. *The Professional Geographer* 66 372–381.
- Thapa, R (2014) Success and failure in MGNREGA implementation in India. ESID Briefing No. 1. Effective States and Inclusive Development Research Centre, University of Manchester, Manchester.
- Tschakert, P (2012) From impacts to embodied experiences: tracing political ecology in climate change research. *Geografisk Tidsskrift* 112 144–158.
- Tschakert, P and M Machado (2012) Gender justice and rights in climate change adaptation: opportunities and pitfalls. *Ethics and Social Welfare* 6 275–289.
- UNDP (2015) MGNREGA Sameeksha II: An anthology of research studies (2012–2014). United Nations Development Programme, New Delhi.
- UNICEF (2020) Gender-responsive age-sensitive social protection: a conceptual framework. UNICEF Office of Research – Innocenti Working Paper 2020-10. Innocenti Research Centre, United Nations Children's Emergency Fund.
- USAID (2016) USAID/Uganda education and research to improve climate change adaptation activity 2016 annual report. United States Agency for International Development, Kampala.
- Vincent, KE, Tschakert, P, Barnett, J, Rivera-Ferre, MG and Woodward, A (2014) Cross-chapter box on gender and climate change. In: Field, CB, Barros, VR, Dokken, DJ, Mach, KJ, Mastrandrea, MD, Bilir, TE, Chatterjee, M, Ebi, KL, Estrada, YO, Genova, RC, Girma, B, Kissel, ES, Levy, AN, MacCracken, S, Mastrandrea, PR and White, LL (eds). *Climate change 2014: impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 105–107.

- Vij, S, Jatav, M, Barua, A and Bhattarai, M (2017) Women in MGNREGS in Telangana and Andhra Pradesh. *Economic and Political Weekly* 52(32).
- Watts, N, Amann, M, Arnell, N, Ayeb-Karlsson, S, Beagley, J, Belesova, K, Boykoff, M, Byass, P, Cai, W, Campbell-Lendrum, D, Capstick, S, Chambers, J, Coleman, S, Dalin, C, Daly, M, Dasandi, N, Dasgupta, S, Davies, M, Di Napoli, C, Dominguez-Salas, P, Drummond, P, Dubrow, R, Ebi, KL, Eckelman, M, Ekins, P, Escobar, LE, Georgeson, L, Golder, S, Grace, D, Graham, H, Haggard, P, Hamilton, I, Hartinger, S, Hess, J, Hsu, S-C, Hughes, N, Jankin Mikhaylov, S, Jimenez, M P, Kelman, I, Kennard, H, Kiesewetter, G, Kinney, PL, Kjellstrom, T, Kniveton, D, Lampard, P, Lemke, B, Liu, Y, Liu, Z, Lott, M, Lowe, R, Martinez-Urtaza, J, Maslin, M, McAllister, L, McGushin, A, McMichael, C, Milner, J, Moradi-Lakeh, M, Morrissey, K, Munzert, S, Murray, K A, Neville, T, Nilsson, M, Sewe, MO, Oreszczyn, T, Otto, M, Owfi, F, Pearman, O, Pencheon, D, Quinn, R, Rabbaniha, M, Robinson, E, Rocklöv, J, Romanello, M, Semenza, JC, Sherman, J, Shi, L, Springmann, M, Tabatabaei, M, Taylor, J, Triñanes, J, Shumake-Guillemot, J, Vu, B, Wilkinson, P, Winning, M, Gong, P, Montgomery, H and Costello, A (2021) The 2020 report of the Lancet Countdown on health and climate change: responding to converging crises. *Lancet* 397(10269) 129–170.
- Wisner, B, Blaikie, P, Cannon, T and Davis, I (2004) *At risk: natural hazards, people's vulnerability and disasters*. 2nd edn. Routledge, London.
- World Bank (7 October 2020) COVID-19 to add as many as 150 million extreme poor by 2021. Press Release. <https://www.worldbank.org/en/news/press-release/2020/10/07/covid-19-to-add-as-many-as-150-million-extreme-poor-by-2021>
- Xavier, G and Mari, G (2014) Impact of MGNREGA on women empowerment with special reference to Kalakkanmoi Panchayat in Sivgangai district, Tamil Nadu. *SSRG International Journal of Economics and Management Studies* 1(1) 1–5.
- Yin, RK (2009) *Case study research: design and methods*. 5th edn. Sage, London.
- Zaidi, M, Chigateri, S, Chopra, D and Roelen, K (2017) My work never ends: women's experiences of balancing unpaid care work and paid work through WEE programming in India. Institute of Development Studies Working Paper 494. Institute of Development Studies, Sussex.
- Zhang, Y, Yu, C and Wang, L (2017) Temperature exposure during pregnancy and birth outcomes: an updated systematic review of epidemiological evidence. *Environmental Pollution* 225 700–712.

Climate change is likely to exacerbate gendered vulnerabilities and compound intersecting forms of discrimination against women. International donors and policymakers are increasingly interested in strengthening social protection programmes to address such adverse impacts, but there is a lack of evidence about how this can be achieved. Addressing this gap, this paper examines the potential of the Mahatma Gandhi National Rural Employment Guarantee Scheme to reduce women's vulnerability to climate risks in Uttar Pradesh, Rajasthan and Madhya Pradesh in India. It provides lessons on priority action areas for integrating gender within the planning, implementation, and monitoring of the programme to better meet women's needs in the face of climate risk.

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