Department for International Development

Climate responsive social protection: Challenges & Opportunities for mainstreaming climate change into MGNREGA in India

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January 2019

Infrastructure for Climate Resilient Growth in India (ICRG) Programme

Submitted By:

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In association with

Climate responsive social protection: challenges and opportunities for mainstreaming climate change into MGNREGA in India

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Abstract

Climate change and the inequalities in its impact are a key challenge for social protection programmes aimed at combating extreme poverty in the Global South. Climate change is likely to intensify the types of risks that people enrolled in social protection programmes will experience in the future. However, there are few projects that integrate both climate change adaptation and social protection objectives, despite both aiming to reduce the risks experienced by vulnerable people. Therefore, this paper aims to 'examine the opportunities and challenges in mainstreaming climate change into Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) via mixed method case-study research in three villages in Odisha, Bihar and Chhattisgarh in India. The findings provide evidence that MGNREGA's potential to address the determinants of vulnerability to climate shocks is limited by: (1) Challenges of convergence (2) Uneven distribution of benefits from asset creation (3) Lack of access to employment that provides livelihood security (4) Gender relations and socio-cultural norms and practices (5) Participation in decision-making on planning and implementation of MGNREGA.

Keywords: climate change; adaptation; vulnerability; social protection; MGNREGA; India

1. Introduction

The IPCC (2014) has projected increased temperatures, sea-level rise and an increase in extreme weather events, which they conclude with high confidence is due to anthropogenic activity, with potentially devastating impacts on food production, livelihoods, freshwater availability and health. Many of the projected impacts of climate change will reinforce and perpetuate poverty, increasing vulnerability. Climate change and the inequalities in its impact are a key challenge for social protection programmes aimed at combating extreme poverty in the Global South. Climate change is likely to intensify the types of risks that those enrolled in social protection programmes will experience in the future.

While there are increasing examples of good practice, there is limited robust empirical evidence showing how social protection interventions, directly and indirectly reduce vulnerability to climate

change. Therefore, this paper aims to add to this limited empirical evidence by 'examining the opportunities and challenges in mainstreaming climate change into the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)[i], via mixed method case study research in Khairani, Mansapur, and Annapurna in India. India is a suitable place for this research as it is one of the most vulnerable countries to climate change globally and MGNREGA is the largest state-led public works programme in the world, with £53,024 million invested, generating 23,440 million person-days since 2005.

This paper begins by conceptualising social protection, vulnerability and adaptation and then outlines the empirical approach adopted for this research. It goes on to examine five key factors that limit MGNREGA's potential to address the determinants of vulnerability to climate shocks: challenges of convergence, uneven distribution of benefits from asset creation, lack of access to employment that provides livelihood security, gender relations and socio-cultural norms and practices, and participation in decision-making on planning and implementation of MGNREGA.

2. Unpacking social protection, vulnerability and adaptation

2.1 Adaptation to climate change

Adaptation to climate change[ii] (see Table 1) typically involves long-term changes in behaviour and practices aimed at reducing vulnerability to future climate change (Pelling, 2011). It is ideally a dynamic process with multiple (overlapping) responses to a range of climate and non-climate shocks on various temporal and spatial scales. It typically includes reactive, concurrent or anticipatory changes (Pelling, 2011; Smit et al., 2000). Adaptation may involve diversifying crops, livestock and/or poultry better suited to changing climatic conditions. In contrast, selling assets to obtain money to survive and rebuild after a climate shock might be a coping strategy. Coping with climate change ensures immediate, short-term survival in a crisis; it does not affect underlying vulnerability (Jordan, 2015). Coping can actually undermine adaptation (Eriksen et al., 2005). For example coping may intensify vulnerability to future climate change by prioritising short-term resource availability (O'Brien et al., 2007; Vincent et al., 2013). The objective of adaptation is in part to reduce the need for coping (Eriksen et al., 2005). However, determining whether an action is an example of coping or adaptation is context and scale dependent (Vincent et al., 2013).

Coping and adaptive strategies can co-occur despite being distinct, and coping strategies may develop into adaptive strategies over time (Berkes and Jolly, 2001). The factors that shape the capacity to cope may complement the factors that influence the ability to adapt over longer timescales. Indeed, the same

context, assets, and exposure to shocks shape both coping and adapting (Adger et al., 2004; Smit and Wandel, 2006). A household's asset portfolio is critical for both processes (Chambers and Conway, 1992; Gunderson, 2010; Moser, 1998). Those with access to diverse assets tend to have greater choice and flexibility in the strategies they adopt to respond to climate change (Author, 2019). Those with eroded assets have access to weaker strategies and fewer choices as to those they employ. Furthermore, the intensity, scale, location, timing, duration, and frequency, by which different types of climate shocks occur can erode the very assets needed for both future coping and adaptation (Smit and Wandel, 2006).

Table 1. Key definitions

Adaptation	'A process of adjustment to new or modified circumstances; it includes the actions people take in response to, or in anticipation of, changing climate stimuli to reduce the impacts or to take advantage of any opportunities that may arise.' (Tompkins and Adger, 2004, p. 78)
Coping	'[S]hort-term mechanisms to ensure survival which do not affect underlying vulnerability (i.e. should exposure to the same hazard occur in the future, [individuals] will probably experience similar negative effects).' (Vincent et al., 2013, p. 194)
Vulnerability	'The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.' (IPCC, 2014, p. 1775)

Adaptation to climate change is largely happening incrementally worldwide (Berrang-Ford et al., 2011; Lesnikowski et al., 2013). Incremental adaptation consists of actions within prevailing governance arrangements and is therefore often referred to as the business-as-usual approach (Kates et al., 2012). It addresses immediate and anticipated shocks by adjusting existing practices to make them better suited to dealing with climate change (Kates et al., 2012; Park et al., 2012). Unlike coping, incremental adaptation reduces vulnerability (proximate causes) in the case of re-exposure to the same climate shock. It might involve rebuilding a house that was damaged in a flood to new specifications, which make it more resilient to flood risk, for example, raising the plinth of the homestead. In contrast, a coping strategy might involve a household migrating to earn funds to rebuild their house to the same specifications (Vincent et al., 2013). This ensures their immediate survival but makes them no more resilient to a flood of similar or greater magnitude (Vincent et al., 2013).

It is unlikely that incremental change on its own will be enough to avoid intolerable risks; there is a need for adaptation that will address how vulnerability is produced (Eriksen et al., 2015; Pelling, 2011; Tschakert et al., 2013).[iii] Multiple forces and processes cause vulnerability itself (Kelman et al., 2015; Bankoff, 2003; Wisner et al. 2004), these are often structural. Their underlying causes are largely shaped by economic, demographic, political, social and gendered processes (Marino and Ribot, 2012; Wisner et al., 2004). Transformational adaptation is necessary to address the root causes of vulnerability to climate change (e.g., social, cultural, and economic relationships, and power hierarchies) through challenging and changing the fundamental attributes of existing social structures and power relations (Brown, 2016; Gillard et al., 2016; O'Brien et al., 2014; Pelling et al., 2015). Transformational adaptation occurs at the long-term end of the adaptation spectrum, cementing systematic and behavioural changes requires longer timeframes than actions associated with incremental adaptation or coping (Few et al., 2017). Responses to climate change that fall short of transformational change can be valuable and indeed poorly planned transformational change may maintain or reinforce vulnerability (O'Brien, 2012; Pelling, 2011).

While the outward objective of adaptation is to reduce vulnerability, the assumption that attempts to do so are always successful ignores the complexity of the relationship between both incremental and transformational adaptation and vulnerability. Indeed, measures intended to adapt to climate change are not always successful (Doria et al., 2009). Past research shows that due to the spatial and temporal complexity of climate change problems and responses, people in different places and at different times may have differing perspectives on the success of a particular adaptation measure (Adger et al., 2005; Barnett and O'Neill, 2010; Eriksen et al., 2015). Measures may simply fail without doing actual damage; they can also become maladaptation, by increasing the vulnerability of other groups and sectors in the future (Burton, 1997). Indeed, maladaptation increases vulnerability but also may generates new risks.

2.2 Links between adaptation and social protection

There has been a growing interest on the part of government and non-governmental organisations (NGOs) in the potential of social protection programmes to reduce vulnerability to climate variability and change (see Heltberg 2007; Stirbu, 2010). Social protection programmes encompass a range of interventions from safety-net programmes to social insurance programmes that enhance vulnerable people's resilience to adverse stresses and shocks that *transfer income and assets to the poor, protect the vulnerable against livelihood risks and enhance the social status and rights of the marginalised, with the overall objectives of extending the benefits of economic growth and reducing the economic or social vulnerability of the poor, vulnerable and marginalised groups'* (Sabates-Wheeler and Devereux,

2006). Indeed, there is some evidence to suggest that social protection programmes and climate change adaptation can potentially be complementary approaches as both aim to reduce vulnerability. Incorporating climate change adaptation into social protection would mean understanding the ways in which social protection instruments and interventions can potentially contribute to climate change vulnerability reduction (see Table 2).[iv]

Table 2. Promoting vulnerability reduction to climate variability and change through adaptive social protection

Time-frame	**Social protection category**[v]	**Social protection instrument**	**Potential co-benefits for climate change vulnerability reduction**
Short-term ↓ Long-term	Protective (coping)	• Social service provision • Social transfers (food/cash), including safety nets • Social pension schemes • Public works programmes	• Protection of those most vulnerable to climate risks, with low levels of adaptive capacity
	Preventative (coping)	• Social transfers • Livelihood diversification • Weather-indexed crop insurance • Social insurance	• Prevents damaging coping strategies as a result of risks to weather dependent livelihoods
	Promotive (adapting)	• Social transfers • Access to credit • Asset transfers or protection • Starter packs (drought/flood-resistant) • Access to common property resources • **Public works programmes**	• Promotes resilience through livelihood diversification and security to withstand climate related shocks • Promotes opportunities arising from climate change
	Transformative (adapting)	• Promotion of minority rights • Anti-discrimination campaigns • Social funds • Proactively challenging discriminatory behaviour	• Transforms social relations to combat discrimination underlying social and political vulnerability

Source: adapted from Davies et al. (2009), p16

Note: These categories of interventions may overlap. For instance, public works projects can both 'promote' incomes as well as 'prevent' deprivation as they aim to transfer short-term food or cash (prevention) and build long-term infrastructure (promotion) (Coirolo, et al., 2013).

However, there are few projects that integrate both climate change adaptation and social protection objectives, despite an adaptive social protection approach offering much potential in reducing

vulnerability to climate shocks (see Table 2). This is a key challenge given the effect that climate change will likely have on social protection interventions and programmes, and will change the types of risks that vulnerable people face (Kuriakose et al., 2013). While there are an increasing number of examples of good practice (Jones et al., 2010), there is limited robust empirical evidence showing how social protection interventions, directly and indirectly reduce vulnerability to climate variability and change (Davies et al., 2013).

Table 2. Potential benefits of adaptive social protection

- Introduces a longer-term perspective for social protection and climate change interventions.
- Aligns social protection programmes with current and future climate change impacts in the project region.
- Supports and strengthen poor and fragile livelihoods based on climate-sensitive economic activities.
- Diversifies livelihoods into income generating activities that are less vulnerable to the impacts of climate change.
- Creates integrated strategies of resilience to tackle climate change through improved coordination between ministries responsible for climate change and social protection.
- Reduces the need to adopt distress coping strategies that maintain or reinforce vulnerability to climate change.
- Uses existing structures or systems to target support (e.g. use social protection systems to direct support to vulnerable climate groups).

Source: adapted from Coirolo, et al. (2013), Davies et al. (2009), Harvey, (2007)

3. Research design and methods

3.1 Selection and description of case study sites

This paper is based empirically on case study research in India, which has been identified, as one of the most vulnerable countries to climate change impacts according to the Global Climate Risk Index 2018 (Eckstein et al., 2018). This study is part of the United Kingdom Government Department for International Development funded 'Infrastructure for Climate Resilient Growth' (ICRG) programme, which provides technical assistance to India's Ministry of Rural Development (MORD) and three states of India, Bihar, Chhattisgarh and Odisha, to improve the design and implementation of natural resource management activities under India's central anti-poverty scheme, the MGNREGA. The ICRG villages

selected for this research were *Khairani* (case study village 1) in Nuapada block, located in Nuapada district, under Odisha state (see Figure 1), *Mansapur* (case study village 2) in Laukahi block, in Madhubani district, under Bihar state (see Figure 2), and *Annapurna* (case study village 3) in Premnagar block, in Surajpur district (Premnagar was formerly located in Surguja district)[vi], under Chhattisgarh state (see Figure 3).

Figure 1. Case study location in Odisha

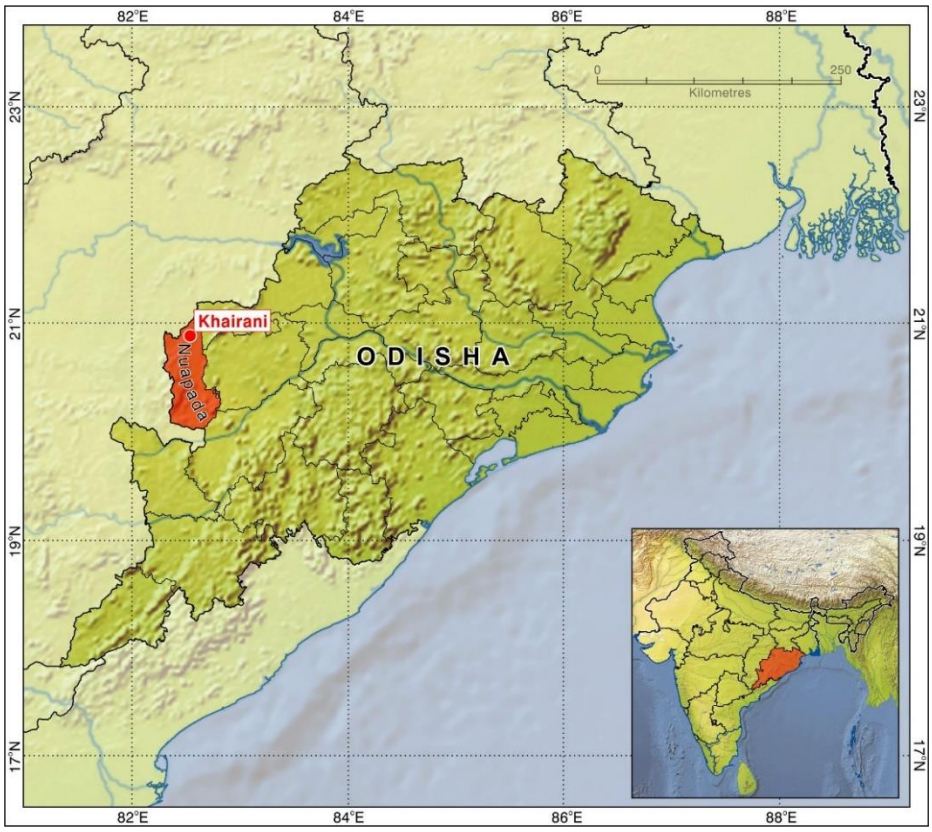


Figure 2. Case study location in Bihar

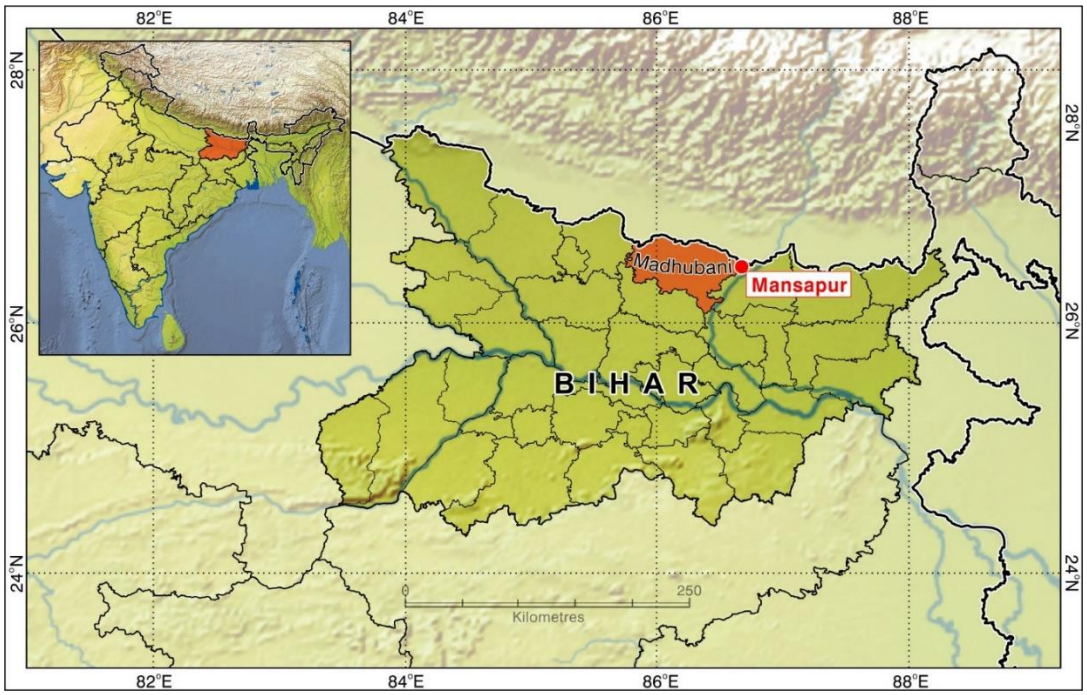
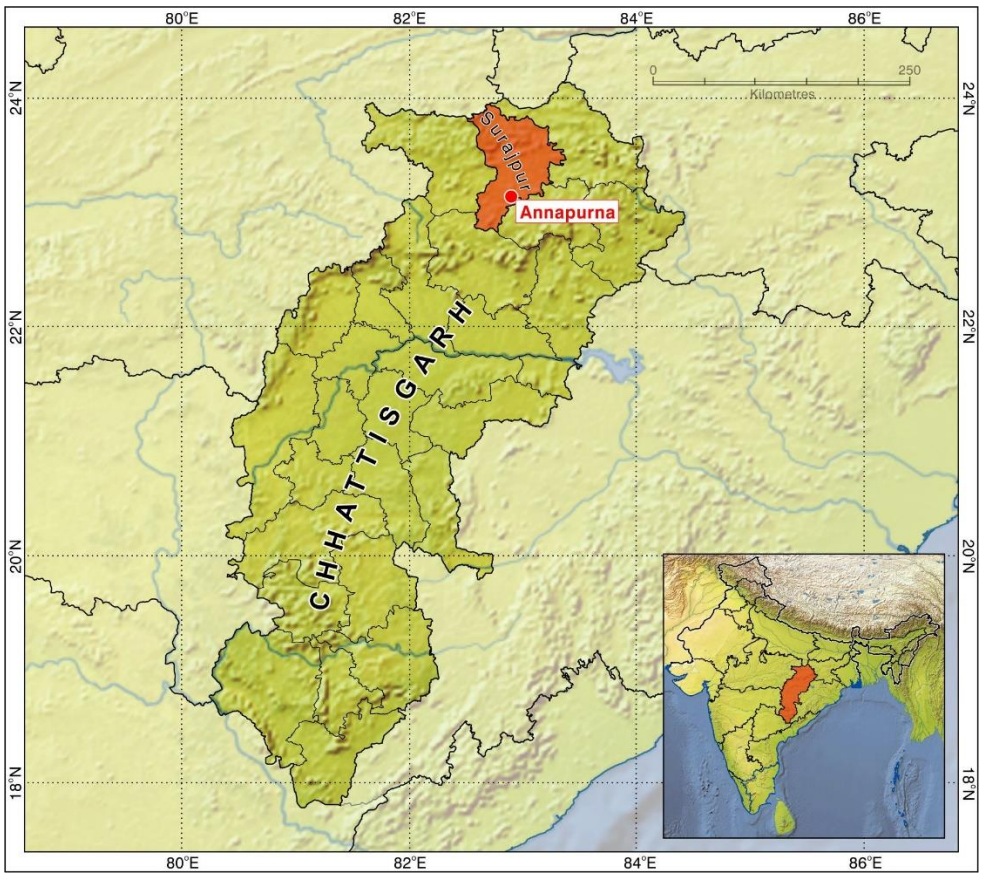


Figure 3. Case study location in Chhattisgarh



These ICRG villages were selected as a suitable case study to examine the opportunities and challenges in mainstreaming climate change into MGNREGA, because of their location in climate vulnerable districts, 'backward' blocks, and the phase of ICRG implementation. The case study villages were selected through a range of criterion. The Central Research Institute for Dryland Agriculture's (CRIDA) climate vulnerability rank and India's Ministry of Agriculture's drought frequency measures outlined in the 'Scoping Study on Infrastructure for Climate Resilient Growth through MGNREGA' (2016) were used as the two sorting criteria to identify the most vulnerable districts to climate change in Odisha, Bihar and Chhattisgarh.[vii] However, less weight was given to the drought frequency measure given that this refers only to frequency, rather than severity. Then the ICRG block within these districts with the lowest backwardness rank were selected. However, the criterion had to be relaxed in some cases, as some of the blocks initially selected did not have ICRG work planned or underway at the time of the selection of the case study sites. The village selected from each of the three short-listed blocks were chosen to ensure that there was variation in the phase of ICRG execution across the cast study villages, in order to allow for the examination of heterogeneity of planning and implementation. The key characteristics of the case study villages are outlined in Table 3 and 4.

Table 3. Current climate variability assessment and climate change projections at block level

Climate Parameter		**Case study village 1** Khairani village, Nuapada block, Nuapada district, Odisha state	**Case study village 2** Mansapur village, Laukahi block, Madhubani district, Bihar state	**Case study village 3** Annapurna village, Premnagar block, Surajpur district, Chhattisgarh state
Climate change vulnerability				
CRIDA-NICRA vulnerability rank (district level)		197	29	151
Temperature				
Highest temperature recorded (1984-2014)		43.7 ºC	43.3 ºC	44.8 ºC
Mean summer maximum temperature (1984-2014)		37.9ºC	35.8 ºC	37.6 ºC
Mean summer minimum temperature (1984-2014)		21.0 ºC	16.3 ºC	19.0 ºC
Change in mean maximum temperature (1984-2014)		0.22ºC	0.6 ºC	0.29 ºC
Change in maximum temperature by 2035 (2021-2050) relative to the historical 1984-2014 period		-	-	-
Rainfall				
Mean June-Sept rainfall	1984-2014	1,134mm	995mm	1,147mm
	2021-2050	1,060mm	1,189mm	1,030mm
Percentage change in mean June-Sept rainfall during the projected period (2021-2050) compared to the historical period of 1984-2014		c. -8%	c. 18%	c. -11%
Standard deviation June-Sept rainfall (1984-2014)		306mm	287mm	343mm

Rainfall variability based on coefficient of variation JJAS rainfall	1984-2014	26.98%	28.84%	29.9%
	2021-2050	32.8%	58.9%	46.4%
Average number of rainy days (> 2.5 mm/day)/year	1984-2014	62 days	62 days	62 days
	2021-2050	113 days	63 days	80 days
Change in number of rainy days (> 2.5 mm/day) during the projected period (2021-2050) compared to the historical period of 1984-2014		45.3%	2%	23%
Average number of rainy days (51-100 mm/day)/year	1984-2014	6.27 days	3.5 days	2.63 days
	2021-2050	6.27 days	7.27 days	8.73 days
Change in number of rainy days (51-100 mm/day in the projected scenario (2021-2050) relative to the historic period (1984-2014)		-	-	-
Average number of rainy days (100> mm/day)/year	1984-2014	-	0.5 days	0.2 days
	2021-2050	2.07 days	1.23 days	1 day
Change in frequency of occurrence of rainfall events of 100> mm/day in the projected Scenario (2021-2050) relative to the historic period (1984-2014)		-	-	-
Highest rainfall event (mm)/day (1984-2014)		148mm	235mm	176mm
Number of years with normal sowing rainfall (June) during the historic period (1984-2014)		6 years	9 years	6 years
Drought events				
Drought (1984-2014)	Mild	12 years	10 years	15 years
	Moderate	c. 4 years	6 years	1 year
	Severe	5 years	0	1 year
Government of India Ministry of Agriculture (MoA) drought frequency (2000-2015, 5 year internal) (district level)		2 years	3 years	2 years

Source: Indian Institute of Science (2017a, 2017b, 2017c); Samaj Pragati Sahayog (2016)

Note: data is at block level unless otherwise stated.

Table 4. Key characteristics of case study villages

Key characteristics		**Case study village 1** Khairani (Nuapada block, Nuapada district, Odisha state)	**Case study village 2** Mansapur (Laukahi block, Madhubani district, Bihar state)	**Case study village 3** Annapurna (Premnagar block, Surajpur district, Chhattisgarh state)
Village profile				
Households		265	921	321
Population		1,454	5,621	1,506
Backwardness rank (block level)		521	119	636
Religion composition of household	Hindu	100%	100%	100%
	Muslin	0	0	0
	Christian	0	0	0
Caste	Brahmin	0	200 (21.72%)	0
	Other general caste (other than Brahmin)	0	0	-
	Other backward class	22.26%	32.57%	-
	Scheduled caste	3.02%	39.20%	-
	Scheduled tribe	74.72%	6.51%	-
Major crops grown		Paddy, vegetables	Maize, sugarcane, vegetables, paddy, wheat	Paddy, maize, wheat, red gram, sesame, black gram, chickpea, horsegram
Source of drinking water		Tubewell, well	Tubewell	Tubewell, wellcanal/river/stream
Source of other used water		Tubewell, tap, well, pond/ditch	Tubewell, pond/ditch	Tubewell, well, canal/river, pond/ditch
Climate risk				
Ranking of climate risks		1. Drought, heat stress 2. rainfall variability 3. rainfall intensity 4 waterlogging 5 flooding	1. Waterlogging, heat stress 2. Drought 3. monsoon rainfall variability 4. Rainfall intensity and flooding	1. Heat stress 2. Drought 3. Monsoon rainfall variability 4. Rainfall intensity 5. Waterlogging 6. flooding
MGNREGA				
Year of implementation of NREGA		2006	2007	2006
Active job cardholders		258	-	-

Households actively seeking MNREGA work in the last 4 years	2014	200	-	173
	2015	170	-	163
	2016	150	-	203
	2017	147	-	193
Daily wage rate for MNREGA work		176 rupees	-	172 rupees
Number of households completed 100 days in the last 4 years	2013-2014	10	-	13
	2014-2015	5	-	17
	2015-2016	5	-	21
	2016-2017	4	-	15
Total MGNREGA person days in the last 4 years	2013-2014	-	-	12,052 (17.72% days by women, 5.63% by schedule caste or scheduled tribes, 0% days by disabled persons)
	2014-2015	-	-	14,012 (26.54% days by women, 6.23% by schedule caste or scheduled tribes, 0% days by disabled persons)
	2015-2016	-	-	14,970 (34.11% days by women, 6.39% by schedule caste or scheduled tribes, 0% days by disabled persons)
	2016-2017	3,950 (39.49% days by women, 52.91 by schedule caste or scheduled tribes, 0% days by disabled persons)	-	16,279 (25.27% days by women, 6.22% by schedule caste or scheduled tribes, 0% days by disabled persons)
Total MGNREGA expenditure (materials plus labour costs) in last 4 years.	2013-2014	-	-	2,031904 rupees
	2014-2015	-	-	2,299884 rupees
	2015-2016	-	-	2,651990 rupees
	2016-2017	1,050000 rupees	-	2,899988 rupees

Source: field data (2018a, 2018b), Jordan, Samaj Pragati Sahayog (2016)

Notes: records of MGNREGA data for Mansapur village was not available from the current PRS.

3.2 Research methods

This study is based on a mixed methods multiple case study design (see Yin, 2009) to understand the potential of MGNREGA to reduce vulnerability to climate shocks. The data was collected from October to December, 2017 and in January and June 2018, and involved a total of 255 residents of three villages, representing 30.94% of total households in Khairani (case study village 1), 9.66% in Mansapur (case study village 2) and 26.17% in Annapurna (case study village 3). Participants were selected through purposeful sampling (see Patton, 2002) as it enables close focus on cases and issues of interest. These case studies primarily followed a qualitative and interpretative approach with an emphasis on context, quality, depth, richness and understanding (Valentine, 2001; Gelo et al., 2008). The qualitative data from the main data-gathering phase of this study is based mostly on in-depth one-to-one semi-structured interviews with 60 female village inhabitants, and 15 focus group discussions with 78 village inhabitants (68 females and 10 males), each lasting approximately 1.5 to 2 hours. Participant observation and transect walks were carried out in each village. The qualitative data was supplemented with 60 household surveys with the head of household or his/her spouse, each lasting approximately 45 minutes to 1 hour, and 3 village surveys with 48 key informants, each lasting approximately 3 to 4 hours. Interview and focus group discussions focused on issues relating to (1) Priorities and needs, (2) Perception and understanding of climate shocks (3) Ranking of climate-related shocks, (4) Impacts of climate shocks and associated responses (5) MGNREGA and ICRG planning, decision-making, and implementation (6) Local decision-making. Discussions were recorded with consent and coded through intensive content analysis to draw out key themes, sub-themes and patterns.

This case study was supplemented with a set of 40 interviews conducted in person in the state of Bihar and Odisha in May 2017, and Chhattisgarh in December 2017, along with telephonic interviews conducted in February-March 2018 in the states of Chhattisgarh and Odisha. The interviews focused on issues relating to the challenges around convergence of the MGNREGA with other programmes conducted by the Ministry of Rural Development and other line departments. The key informants were (1) block development officers, CEO Zilla Parishads and other block and district level officials (PD DRDA, APO), (2) MGNREGS functionaries – Gram Rozgar Sevaks, Junior and Senior Engineers, and (3) ICRG technical staff and ICRG district coordinators.

4. Results and Conclusion

The findings from empirical evidence highlights five key factors that limit MGNREGA's potential to address the determinants of vulnerability to climate shocks: (1) Challenges of convergence (2) Uneven distribution of benefits from asset creation (3) Lack of access to employment that provides livelihood

security (4) Gender relations and socio-cultural norms and practices (5) Participation in decision-making on planning and implementation of MGNREGA.

4.1 Convergence of the MGNREGA with other programmes conducted by the Ministry of Rural Development and other line departments

One common finding from the key informant interviews is that convergence is seen as a crucial input to MGNREGA's asset creation function, especially around Natural Resource Management (NRM) assets. Without the important assistance that line departments can provide to MGNREGA officials in providing both technical support and financial resources, the type of assets that are durable and at the same time, livelihood enhancing, are unlikely to be created. This is especially in the light of the 60:40 rule in MGNREGA, where the materials component cannot exceed 40 per cent of total costs. Under the aegis of convergence, it is possible for MGNREGA projects to be undertaken, where critical inputs needed for the projects to be successful can be obtained from departments such as Fisheries, Horticulture and Forest that may have otherwise counted as material costs and exceeded the 40:60 rule. One example of this was the provision of fish seeds in a pond built under the MGNREGA program in Chhattisgarh that was visited during the field trip in 2017, where the fish were reared and sold by the villagers later. This would not have been possible without the involvement of the Fisheries department. Similarly, a pipe constructed to take water from a river upstream for drinking and cooking water for a village which was visited in Odisha would not have been possible without the material costs of the pipe being provided by the Agricultural department. In both cases, the projects were planned by the Gram Panchayat in consultation with the line department representatives and executed with the technical assistance and resources provided by specific line departments.

However, in the interviews conducted, it was also clear that successful convergence was only possible when there was close coordination between the Gram Panchayat, the MGNREGS project functionaries and line department officials. In the most successful cases, this occurred in weekly or fortnightly meetings called by the Block Development Officer or the CEO Zilla Parishad. Here, a senior level bureaucrat took the initiative to call the meetings and made sure all the relevant functionaries attended. In one of the meetings, plans for convergence were developed and then followed up subsequently. On the other hand, where there was no such coordination, convergence either did not occur or was not successful. Therefore, leadership at the local level was crucial for the success of convergence.

Overall, there are clear differences in rates of progress on convergence across work category and across states. This is evident whether one uses total expenditures under convergence, proportion of works under convergence or contribution from line departments. We also see clear evidence of convergence

occurring in ICRG villages, where several line departments have been involved in convergence. However, we see less evidence of convergence in Odisha, and very little in Bihar. Key informant interviews suggest that the main constraint for convergence is the difficulty of coordination across line departments. Where it has occurred successfully, it has been due to local leadership originating from the district and block officials, with the assistance of ICRG personnel.

There was also a risk that convergence would be driven by local bureaucrats and not be 'owned' by the local government officials. This then contradicted one central tenet of the MGNREGA – the participatory nature of the programme, where the conception and implementation of MGNREGA projects would be driven by local government officials, and be participatory in nature. There was then a trade-off between bottom up local government accountability and top down bureaucratic involvement. In the best cases, this trade-off was managed well, with the right balance between accountability and efficiency. But there were many cases where local government did not have a strong voice and convergence essentially became a mechanism for line departments to spend their budgets and where their interest in convergence was primarily driven by the need to supplement their resources with the costs of labour being provided by the MGNREGA.

4. 2 Uneven distribution of benefits from asset creation

MGNREGA's emphasis on asset creation is not without merit, but who will benefit from these assets? Several Climate Resilient Works (CRW) across Bihar and Chhattisgarph are assets for individual farmers (e.g., private wells), the creation of individual assets in these cases, instead of community level assets (local public goods), has many potential pitfalls (e.g., may exacerbate inequality in the village). This prompts a reflection on: What is the benefit of individual assets to the community? Which individuals will benefit from this? Why create benefits for some individuals in the village over others? These questions require further research. However, Pankaj's (2017) study points towards some potential limitations of creating individual assets through MGNREGA, landless rural labour households are excluded from the benefits by default, as they do not own any land (Pankaj, 2017).

Moreover, the benefits from asset creation in MGNREGA – whether individual or community, is often uneven. Uneven distribution of benefits is in part due to circuits of control and power at the local level (exploitative patron-client relationships) that may act to reproduce exclusion and injustice within the village; reducing MGNREGA's potential to address the persistent determinants of vulnerability to climate change. It was found in one case study village, that most of the MGNREGA work was completed by machinery (rather than MGNREGA job cardholders), coordinated by an influential contractor connected to local village leaders. Many MGNREGA job cardholders reported that their job

cards and passbooks were taken away by the local political elite and in return were given a small payment of 100 rupees for every 2,000 rupees earned. However, the local political elite claim that they cannot find people to carry out the earthwork, and similiarly some interviewees stated that earthwork is not valued highly in society and they would prefer to migrate to urban areas for livelihood opportunities.

4.3 Lack of access to employment that provides livelihood security

Lack of access to employment that does not depend on climate sensitive economic activities can reduce resilience to climate shocks. The findings indicate the need to create alternative livelihoods, both non-farm and off-farm to reduce the dependency on agricultural land for income and to increase women's economic empowerment. Women agricultural labourers are worst affected by droughts and floods as they lose their wage because of no harvesting. Most of the respondents lease land as sharecroppers. As leasing land is not legal in Bihar state, tenants do not get any compensation for crop loss due to extreme climatic events like drought and flood as they do not have any legal documents. Landowners whose investment on crop production is meagre are compensated for crop loss, however this financial support is often not passed onto tenants. Hence, tenants and small, marginal farmers are worst affected by climate shocks due to lack of access to and control over land.

It is clear that climate shocks are reinforcing established migration patterns in the villages, the majority of interviewees indicated that many families are migrating out of the village for extended periods of time (for example, up to six months in Odisha) due to drought. In these instances, inadequate arrangements are sometimes made for family who stay at home; creating additional burdens. The evidence highlights that this increases the responsibilities of de facto female household heads, with added pressure to provide food and meet basic needs without the support of the main income generator.

The demand-driven job creation is an important principle of MGNREGS, though the findings provide limited evidence that this has occurred. The market wage rate of a male casual worker in most cases is higher than that of MGNREGA wage rate, thereby making it potentially more attractive for female workers who in most cases would earn less than their male counterparts in the open market. The percentage of households completing 100 days of wage employment per fiscal year no more than 6.54 per cent (2013-2017) in case study village 1 and 3. No data is available for case study village 2, however it is unlikely that the percentage of wage employment would be higher given that MGNREGA performance in Bihar has been poor historically. While most interviewees confirmed that MGNREGA work provides livelihood opportunities, the number of workdays is not enough to reduce food insecurity or to increase resilience against the impacts of climate shocks. The delay in MGNREGA payments and the complicated payment process creates further difficulties for households accessing financial support

at times of acute need. Similar to Pankaj (2017), this study found that the most vulnerable households cannot afford to wait for payments, especially as they participate in MGNREGA to meet the needs of their daily consumption expenditure during the lean season. In many cases this led to households relying on credit until they were paid, and the poorest had the greatest reliance on sometimes predatory informal loans.

4. 4 Gender relations and socio-cultural norms and practices

Lack of implementation and monitoring of gender sensitive provisions in MGNREGA – childcare crèches, provision of good quality drinking water, shade for children and periods of rest, limits its ability to reduce women's vulnerability to climate shocks. More generally, MGNREGA tackles a very narrow group of able women who can perform arduous, manual labour. Indeed, the main reasons cited for lack of women's participation in MGNREGA work, include, hardship of soil digging, responsibility of unpaid care work responsibilities, and house construction work during the summer months. Moreover, female-headed households are dependent on males from other households to participate in MGNREGA as digging and throwing of mud or soil on worksites is commonly done in pairs. It is unclear if wage sharing in these instances is equitable. The absence of a male partner to work with was highlighted as a reason for not participating in MGNREGA as women tend to be involved in throwing mud or soil rather than digging, although none of the respondents indicated any social restriction against digging. Hence, female-headed households are often (this was not the case in case study village 1) given preference to provide drinking water in the worksites to enable them to participate in the MGNREGA work without depending on males from other households. However, scheduled caste women are not allowed to participate in work involving the distribution of water on worksites as none of the other workers from other castes would accept the water.

Furthermore, women's unpaid care work responsibilities increase their drudgery and limit their participation in the workforce. Unpaid care work is understood as the set of domestic household responsibilities, care of people and tasks such as fetching water and gathering firewood. Many women with children that lack access to childminding support (both at home and absence of crèche facilities at MGNREGA worksites) are unable to fully participate in MGNREGA. It is common for older women within the household to take on childcare responsibilities while women go to work, in some cases it was even found that young girls have to take off school for housework and taking care of younger siblings during MGNREGA work. Hence, irrespective of age, women and girls are responsible for unpaid care work, and participation in MGNREGA can deepen their time poverty.

Unpaid care work responsibilities are becoming more challenging due to climate shocks and drying of the water sources (specifically in the summer months), and the decreasing size of the forest. Collecting drinking water is particularly challenging in case study village 3 due to the elevation of the land and poor quality roads. While it usually takes women on average 10 to 60 minutes to collect water, this increases to 30 minutes to 2 hours for the majority of families during the summer months as most of the tube wells installed by the government are completely dry or only small amounts of water are available. Some of the hamlets, like Behera Dhab and parts of Salewa para in case study village 3, face even greater difficulties collecting water, with women having to invest at least one to two hours to collect drinking water each time. The water structures, pond or the small well, constructed under the MGNREGA could have reduced the drudgery of women by reducing the time allocated for water collection, however, due to low rainfall, most of the structures are dry, even in the month of November, just after the monsoon season. More generally, socio-cultural norms prevent women 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 in the local area.

4. 5 Participation in decision-making on planning and implementation of MGNREGA

The usefulness of the selected works is considered to be higher if it is done through the Gram Sabha. However, the findings highlight that participation in decision-making on planning and implementation of MGNREGA can be reduced by gender specific ideologies surrounding socio-cultural norms. Women's unpaid care work responsibilities, purdah norms, location of the meeting venue (gram panchayat bhawan), and unavailability of other family members to look after the house, were cited as reasons for women not attending village meetings. Women often feel uncomfortable to speak in public in the presence of male relatives, this is particularly the case for women of general caste and other backward castes, in comparison to scheduled caste families. Nevertheless, it was found in case study village 1 that the participation of women in the panchayat meetings has increased as the MGNREGA programme requires participation of women Self Help Group (SHG) members in the Panchayat decision-making process. While women SHGs were specifically invited to meetings related to MGNREGA, not all women are members of SHGs, specifically, recently married women, young mothers and those who migrate for most of the year. In contrast, women's participation in the community decision-making process specifically related to government schemes and programme implementation was found to be meagre in case study village 3. In case study village 2, irrespective of gender, participation in the Panchayat decision-making process is quite low in the village. Most of the villagers were unaware of the village meeting, locally called Gram Sabhas. Critically, the majority of

interviewees were unaware of any meetings held to decide the type of ICRG work or specific location of the site in the village.

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[i] It legally guarantees the provision of 100 days of labour with a minimum salary fixed by the state to every rural household that requests it. This employment is then directed towards the creation of durable assets and works that lead to the enhancement of ecosystem services (e.g., afforestation, micro and minor irrigation works).

[ii] Climate change creates a range of environmental risks. One way to classify these risks is temporal: sudden-onset disasters are climate hazards and slow-onset disasters are climate processes. Climate hazards include cyclones, which are sudden and dramatic and last for a short period. By contrast climate processes include salinity intrusion, which takes place over a longer period of time but has significant impact.

[iii] However, incremental adjustments may set in place pathways towards transformation (Pelling, 2011). On the other hand, it can act to delay transformation, potentially increasing risk (Matyas and Pelling, 2015).

[iv] See Davies et al. (2009) for a discussion on the benefits and challenges of social protection for adaptation to climate change.

[v] See Davies et al. (2013) for an in-depth understanding of the Protection-Prevention-Promotion-Transformation categories.

[vi] Surguja district was split into two districts in 2012-2013, Surajpur and Surguja. This resulted in Annapurna village being recategorised as part of Surajpur district. However, the secondary data used in this paper is based on the former district categorisation as data sources prior to 2012-2013 have not been updated. Block level data has been used where possible.

[vii] District level data was used as block level data was unavailable at the time of village selection.