Connecting the dots

Climate change, migration and social protection

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- Supporting public planning processes in delivering climate-resilient development outcomes for the poorest
- Supporting climate change negotiators from poor and vulnerable countries for equitable, balanced and multilateral solutions to climate change, and
- 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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There are several aspects of climate-induced short-term or circular migration, especially in combination with other socioeconomic factors, that are not fully understood. Without reliable data on the pattern of circular migration, policymakers can not recognise or address migrants' needs, issues and vulnerabilities. This paper provides an understanding of what drives migration, the patterns associated with it, and its issues and consequences. It also gives broader policy recommendations on how to use social protection programmes to provide a safety net for migrants, both at source for family members staying back and at destination.

Contents

Summary

Background

The agriculture-based seasonal nature of employment in rural areas in India means that communities may not have year-round livelihood options. People are forced to migrate from rural to urban areas in search of employment because they do not have enough savings to meet their consumption needs. 'Migrarian' (migration and agriculture) livelihoods now form a crucial part of India's economy (Sharma et al., 2014), and migration has become a significant livelihood option across rural India (Singh, 2019). The Economic Survey of India (2016–17) estimated that at least nine million people migrated between 2011 and 2016 within the country, most of them in search of work. These internal migrants contribute 10% to the country's GDP (UNESCO, 2019).

To reduce 'distress migration' from rural communities, the Government of India has a long history of running safety net and adaptive social protection programmes. These aim to provide wage employment through public works programmes during agriculture's lean periods or during climate extremes like droughts and floods. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) that guarantees 100 days of employment to every rural household in a year is one such programme. It also has provision for 50 days' additional wage employments in areas effected by climate hazards like floods, cyclones, droughts and so on under its MGNREGA scheme. The intention is to create climate resilience and help the vulnerable households cope and recover from these climatic events. However, actual results show that MGNREGA has been far from successful for several reasons, including operational and administrative issues.

Effective social protection programmes can provide people with a safety net against distress migration. This is especially important as distress migrants may be at a disadvantage in the urban labour market and can be exploited. But we also need to understand that, for many, migration serves as an opportunity, where they would have otherwise fallen deeper into poverty traps. Migrants can earn higher wages in urban destinations, allowing them to accumulate cash and buy assets back home to secure longer-term livelihoods and exit from intergenerational poverty.

There are several aspects of climate-induced short-term or circular migration, especially in combination with other socioeconomic factors, that are not fully understood. Without reliable data on the pattern of circular migration, policymakers will not recognise migrants' needs, issues and vulnerabilities, and these may not be addressed through social protection programmes. It is also important to understand the vulnerability of those left behind. Policymakers need to know whether MGNREGA is supporting rural households and their migrant members to cope with both economic and climate crises.

Research approach and objective

To give policymakers better insights into these issues, IIED has researched the underlying drivers of migration, patterns associated with it, issues and consequences of migration, and how to support migration so that it helps the community build their resilience. We examine whether migration should be allotted more centrality in MGNREGA guidelines – not to prevent it but rather to help communities use its opportunities.

The relationship between climate change stress and its impact on migration is complex to understand. It is very difficult to distinguish individuals for whom climatic factors are the sole motivation for migration because several economic and sociopolitical factors interplay with climate drivers to increase the vulnerability of a household. This study has used migration intention and a binary logistic regression model to understand the extent to which climate change and socioeconomic factors impact intention to migrate. In the study, migration intention has been used as a proxy to measure the likelihood of future out-migration from the study areas. To understand how the decision to migrate is affected by climate change and socioeconomic factors, 12 independent variables were selected, covering climate-related parameters and the household's socioeconomic characteristics. Climate variables covered slow as well as rapid onset events like drought, flood, heatwave and hailstorm. The severity of each event as scored by the household was used in the regression model as the main independent

variable. Household size, household income, age, sex and level of education were covered under the socioeconomic variables.

Primary household surveys of 1046 households across three Indian states, Rajasthan, Uttar Pradesh and Madhya Pradesh, and 48 focused group discussions were carried out across sample villages. Out of surveyed households, 27.4% were Scheduled Caste (SC), 36.4% were Scheduled Tribe (ST) and 32.9% were from Other Backward Class (OBC).[1] Three regression models were run for the study. The first model (Model 1) examined the relationship between socioeconomic vulnerabilities and migration intention. The second model (Model 2) examined the relationship between vulnerabilities due to climate change stress and migration intention. The third model (Model 3) analysed the nexus between socioeconomic and climatic factors on migration intention.

Findings

Patterns of migration. Of households surveyed, 37% have had at least one member migrate in the past. The percentage is highest in Uttar Pradesh (50%), followed by Madhya Pradesh (34%) and Rajasthan (28%). Migration from the three states is predominantly seasonal (61.4%). Males mostly migrate to major cities and different states once or twice a year, depending on climate situation. Low returns or failure of existing livelihoods of agriculture and fisheries trigger seasonal migration. Seasonal migrants usually go to major cities in Maharashtra or Gujarat, or to Delhi. They normally work in brick kiln, construction sites or cotton fields of neighbouring states like Maharashtra and Gujarat. Migrants send remittances once every month or every two to three months. Remittances have improved migrant households' standard of living by enabling them to pay for daily consumption, healthcare and education bills.

Drivers of migration – climate acting as a stress multiplier to socioeconomic factors. Of the total surveyed households (1046), more than two thirds (70%) of the respondents indicated that drought/ irregular rainfall is a significant stressor. In addition, 23% of households mentioned flood as a significant stressor, while 8.3% mentioned hailstorms.

Odds ratio (OR) in regression analysis is a measure of association between exposure and an outcome. An OR of one means that there are no higher or lower chances of the outcome happening. An OR above one means that there is a greater likelihood of the outcome and an OR below one means that there is a lesser likelihood of the outcome.

(i) Climate-related events

Drought: The alarming increase in the frequency of droughts is a common trend in all the three drought-prone states. More than 70% of the households in study regions said that the frequency of droughts had increased significantly in the last 5–10 years. Results indicate that households exposed to drought are 1.157 times as likely as those who are not exposed to have the intention to migrate.

Flood: Uttar Pradesh had experienced significant flooding in the last 10–15 years. During monsoons, heavy rains regularly flood villages on the riverbanks. Households that are exposed to flood are 1.419 times as likely as those who are not exposed to have the intention to migrate.

(ii) Socioeconomic variables

Household size: The size of the household also determines how a household is able to manage in times of climate-related events. The larger the household size, the more vulnerable they may be in times of a climate crisis. On the other hand, larger households might be able to easily send one of their members on migration. The OR of 1.153 suggests that household size increases the intention to migrate by 15%. To enhance climate resilience outcomes, social protection programmes will need to tailor their provisions by taking the current and future demographic trends into consideration.

Age of household head: Higher incidence of male migration occurs in the age group of 21–30 compared to other age categories. Results indicate that an increasing age of the household head decreases the intentions to migrate (OR = 0.981). Older populations are less inclined to migrate. As the migration options and mobility of older household members reduce, the social protection programmes will need to consider provisions that provide them with adequate coverage at village level during the climate crisis.

Education: The educational level of the household head plays an important role in their welfare and determines the level of information available and capacity to prepare for climate-related events. Male migrants with primary and secondary education migrate more than those with higher education. Household heads with no education have more intention to migrate than those with secondary (OR = 0.654) and higher secondary (OR = 0.542).

[1] Scheduled Castes (SCs), Scheduled Tribes (STs) and Other Backward Class (OBC) are among the most disadvantaged and marginalised socio-economic groups in India. The terms are recognised in the Constitution of India and the groups are designated in one or other of the categories.

Migration networks: These are sets of interpersonal ties and links that a household or individual may have with existing migrants, former migrants, and non-migrants in origin and destination sites, which makes migration easier. These networks provide information and support on place of stay, employment and access to basic services at the destination site, encouraging people to migrate. Results reveal that migration networks increase the intention to migrate by more than 50% (OR = 1.514).

Gender dynamics: In case of female migrants, the decision to migrate is dependent on the household head. In 90% of the villages, there is no family migration, and it is mostly one or two adult members of the family who migrate. Migration of the whole family was mainly seen in Barwani district of Madhya Pradesh. The land/house and livestock ownership of the family usually restricts the entire family from migrating. Children's education is also one of the reasons. Females have to take on the additional responsibilities of managing the household and livestock, and mostly work under MGNREGA.

(iii) State-wise results of the regression model

Rajasthan: The results explain 33% of the variation in the data. Household size, age of household head, income and migration network are significant socioeconomic variables that effect natural resource-based livelihoods and migration decision making. But drought has a positive effect on intention to migrate (OR = 1.112). It can be said that **both climate and socioeconomic factors play a role in migration decision making in Rajasthan.**

Uttar Pradesh: The results explain 29.8% of the variation in the data. While socioeconomic variables like household size, age, education, income and migration network are important, the model reveals that exposure to drought (OR = 1.941), flood (OR = 1.001) and hailstorm (OR = 2.115) **act as 'stressors' and drive individuals/households to consider migration as a survival strategy in Uttar Pradesh.**

Madhya Pradesh: The results explain 11% of the variation in the data. The model shows that exposure to drought has a positive effect on intention to migration, but **socioeconomic factors play a more important role in migration decision making in Madhya Pradesh.**

The model empirically and statistically proves that climate impacts act as stress multipliers, particularly for those who are already socioeconomically vulnerable, driving them towards distress migration.

(iv) The push and the pull factors

Migration is becoming increasingly important for climate resilience. Migration is becoming established as a household adaptation strategy to cope with climate and economic stresses in survey areas. During climate distress, when slow-onset events such as drought threaten natural resource-based livelihoods such as agriculture, livestock and fishery, people's ability to earn a living is compromised. This motivates them to consider migration in search of better economic opportunities. Similarly, when rapid-onset hazards such as hailstorms or floods damage crops, cultivable lands and property, communities may have little or no options for adapting in situ. Under such situations, migration is the only viable option for survival. Overall, 69.74% households across all three states reported that they migrate immediately after drought, flood, hailstorms or heatwaves occur.

Migration has negative consequences as well as benefits. Whilst migration can give rise to economic benefits, there are other social consequences, both for the migrants and the families (mostly women, children and elderly) that are left behind. Migration has many costs and risks associated with it that are difficult for poor and vulnerable people to cope with. Migration leads to breaking up of families and affects gender roles. The migrant-receiving areas are often inadequately prepared to accommodate migrants and often lack basic shelter and sanitation facilities and can't guarantee women's safety. Where migrants live in unsanitary conditions they are exposed to more disease. Labour and workplace safety laws are widely disregarded. Migrants are often forced to overwork, are paid less than non-migrants, and are exposed to polluting working conditions. Moreover, they do not have any employment security.

Recommendations

Results show that social protection programmes in their current form will not work unless they consider climate stress in their design framework and include climate resilience as one of its outcomes. Revamping MGNREGA would help it achieve its full potential. Underlying operational inefficiencies and challenges need to be addressed. It also needs to change to help migrants deal with the challenges they face at migration destination sites. Some recommendations to help MGNREGA achieve this are:

Breaking the rural–urban silos. MGNREGA needs to reconsider the current limiting of benefits to people who remain in their native village. Workers who undergo climate-induced distress migration or displacement are left without social protection and often have to live and work in sub-human conditions for survival; devoid of any rights, benefits or entitlements. At the same time,

not everyone is able to move out. Women, children and people from marginalised communities may be left in straitened circumstances that exacerbate their vulnerability. If the migrant worker cannot send back money, they can be particularly hard hit. Government policy response needs to extend rights and social safety net provisions to migrant workers in the destination sites through MGNREGA in convergence with other social protection schemes.

Strengthening MGNREGA in migration source areas. MGNREGA needs to provide a steady source of income and livelihood security for the poor and the marginalised, so that it can act as an essential means for coping with climate shocks. Our research shows that families and individuals undertook distress migration when they perceived that there was no other option to survive. For these people, MGNREGA did not act as a viable safety net. Administrative delays in sanctioning work and lack of transparency and delays in wage payments are some of the reasons that families do not consider MGNREGA as a fallback option during crisis. Having only 100 days of work guaranteed per year at most, and with comparatively lower pay than urban wage rates, does not help. Migrants feel they will be able to sustain their families better if they migrate, even though it exposes them to hardship at destination sites. Respondents in the research areas across the three states came up with many suggestions on how MGNREGA can be strengthened. While some of these pertained to improving the existing programme's delivery in terms of timely work availability and wage payments, others relate to revising the scheme, such as by increasing the minimum guaranteed days of employment. These deserve careful consideration by government.

Making workers migration ready and creating safe pathways. Most migrants have little or no education and fall broadly under the category of unskilled workers. But with rising standards in industry (Make in India; Zero Defect Zero Effect[2]) and large construction/ infrastructure projects, the demand for skilled jobs has gone up, creating a mismatch between the skills of labour supply and demand. There is a need to carry out a national-level mapping of the skill requirement in major destination sites and to develop a systematic programme for skill enhancement matching those requirements, complementing this with certification and placement services.

Broadening the focus. There is a need to broaden the focus of MGNREGA from being a purely natural resource management-based approach to one that also emphasises human resource development. It must recognise the multi-locational nature of livelihoods and provide communities with adequate means, resources and information to enable them to make informed choices. MGNREGA should not seek to limit people to rural areas. The scheme needs to recognise that migration is people's own effort to access employment and should explicitly recognise migration's central role in protecting and promoting rural livelihoods. Policymakers should:

- Develop a clear comprehensive framework that integrates migration into the MGNREGA's operational guidelines, so that it does not lose priority.
- Give due emphasis to developing human capital through skill development, focusing on landless people or those with limited access to land and other natural resource-based livelihoods.
- Expand the scheme's safety net to address the vulnerabilities of both migrants and those who stay behind. The entitlements for 100 days of work should not just lie with the household members who remain in the village but should also cover the migrant family member.
- Develop effective strategies for convergence with other schemes/programmes on housing, health and education in order to provide comprehensive cover.
- Increase the bargaining capacity of the rural workers to demand decent working conditions and wage rates.

[2] "Zero Defect Zero Effect" policy is being promoted by the Government of India and it signifies two things: production mechanisms wherein products have no defects and production processes which have zero adverse environmental and ecological effects.

1 Context

Perhaps more than any other country, India needs to prepare for climate migration. With a population of 1.3 billion, high dependence on agriculture, and 270 million people living on less than US$1.90/day (Ahmed et al., 2021), India is probably one of the countries most vulnerable to climate change. The Global Climate Risk Index 2021 ranks India the seventh most vulnerable country based on 2019 data (Eckstein et al., 2020). A significant proportion of its poor, including smallholder farmers and landless agricultural workers with low adaptive capacity, will be hit hard by increasing climate variability, which will damage crops and livelihoods.

Internal migration as a subsistence strategy is already on the rise. Around 200 million rural people already use short-term circular migration as a livelihood strategy: 15.38% of India's total population (Desai et al., 2015). Rising rural distress and urban economic growth[3] makes migration from rural to urban areas inevitable. Climate change will further drive this migration.

This trend and broad generalisation may not be true in all circumstances. Not all rural areas will be a source of out-migration, and similarly not all cities will be in-migration hotspots. Reverse migration during COVID-19 lockdowns and urban floods in the past years demonstrate that Indian cities are vulnerable. Their unplanned and rampant expansion will make them more susceptible to climate change's effects.

Nevertheless, rural–urban migration will increase in the future as agriculture-dependent livelihoods come under increasing climatic stress. Urban (and peri-urban) areas will continue to support growing numbers of people via rapid urbanisation and infrastructure growth.

The COVID-19 pandemic emerged as an eye-opener for the policymakers where migration populations go unnoticed in climate change adaptation plans and other developmental planning (Cundill et al., 2021).

1.1 What the statistics indicate, and the problems with the numbers

The Economic Survey of India (2016–17) estimated that at least nine million people migrated between states within the country every year for either education or work. That's almost double the inter-state migration recorded in 2001–2011.

Internal migrants contribute 10% to the country's GDP (UNESCO, 2019). The National Sample Survey Organisation (NSSO) data from 2007–08 revealed that about 28.3% of the workforce in India are migrants. It counts short-term migrants as those who have not stayed in their "usual place of last residence" for between one and six months, and so will miss some short-term migrations.

According to the decennial 2011 census, the data on migration by place of last residence in India shows that the total number of migrants is 454 million (considering all durations of residence) of which 141 million (31.06%) are men and 313 million (68.94%) are women. Among women, marriage is the most important reason for migration (Census, 2011).[4] This count is likely to miss a significant number of short-term 'circular' migrants, because they have as much of a chance of

[3] India's urban population of 377 million in 2011 is projected to almost double to 820 million in 2050.
[4] https://censusindia.gov.in/Data_Products/Data_Highlights/Data_Highlights

being counted in their place of birth or last residence as they do at their new destination.[5] This was a change implemented since the 2001 census, which did not use a minimum length of stay at the new residence to define a migrant. Even so, this number was 314.5 million in the 2001 census. In other words, it increased by over 44% between 2001 and 2011.

About 161 million people (over 35%) have migrated during the past decade (ie a duration of 0–9 years). Among women, marriage is the most important reason for migration. For men, the most important reason is work. More than 15 million out of over 56 million male migrants (27%) moved for better employment opportunities during the decade (Census, 2011). Education is another important reason for both male and female migration in various parts of India. The data also shows that 15 million men/boys and 20 million women/girls moved with their households in the last decade. This movement is mostly from rural to urban areas and from smaller towns and cities to larger urban areas in India. The state-wise migration patterns can be seen in Annex 1.

Overall, official statistics tend to underestimate temporary migration, and the NSSO and the Census will need more robust definitions if they are to capture short-term migration. The India Human Development Survey (IHDS) provides more accurate data on the circular migrants. It estimated there were over 200 million in 2011–2012. That is more than ten times the 15.2 million short-term migrants estimated by the 2007–08 NSSO.

Migrant workers are often employed in construction, brick kilns, stone quarries and carpet weaving, and as street vendors, waiters in hotels and so on. (Ashok and Thomas, 2014). India's brick kilns employ between ten and 23 million workers (NSSO, 2009–10; Anti-Slavery, 2017). These workers are vulnerable to exploitation because they often take out a high upfront loan from a labour contractor. This 'middleman' then employs them, taking repayments from their wages, which exposes

Table 1. Patterns of migration in India, as recorded by the 2011 census

		IN MILLIONS		
CLASS OF MIGRANTS		TOTAL	MALE	FEMALE
All durations of residence[6]		453.64	140.96	312.68
Duration of residence 0–9 years (2001–2011)		161.42	56.76	104.66
Reasons	Work/employment	18.69	15.48	3.21
	Business	1.31	0.96	0.36
	Education	5.15	3.00	2.15
	Marriage	60.18	1.49	58.68
	Moved after birth	20.93	10.99	9.95
	Moved with household	35.54	15.25	20.29
	Others	19.62	9.59	10.03
Patterns	Rural–rural	69.10	15.70	53.40
	Urban–rural	11.46	4.71	6.74
	Rural–urban	32.16	15.03	17.12
	Urban–urban	32.95	15.05	17.90

Note: All durations of residence include 'unspecified duration'.
Data source: Migrants by place of last residence, age, sex, reason for migration and duration of residence, Census of India, 2011

[5] The definitions adopted by the NSSO and the census are unlikely to result in reliable estimates of short-term migration. The census defines a migrant as a person residing in a place that is different from his or her place of birth or "usual place of last residence", where the latter refers to place of residence for six months or more. This is likely to miss a significant number of short-term migrants who have as much of a chance of being counted in their place of birth or last residence as they do at their new destination. The 2007–08 National Sample Survey (NSS) counts short-term migrants as those who have not stayed in their "usual place of last residence" for a period of between one month and six months.
[6] Duration 20 years and above https://censusindia.gov.in/Data_Products/Data_Highlights/Data_Highlights_link/data_highlights_D1D2D3.pdf

them to exploitation and debt bondage (Anti-Slavery, 2017). The top destination for migrants is Delhi, followed by Mumbai, however the southern states have also become a major destination for migrants in recent years. The main source areas are Uttar Pradesh (UP), Bihar, Madhya Pradesh (MP), West Bengal and Assam. Migrants to the southern-most state of Kerala travel more than 3,000 kilometres.

1.2 Social protection programmes: their role in migration and climate resilience

The agricultural and seasonal nature of rural employment means that communities may not have year-round livelihood options. People's limited savings force them to migrate in search of employment. Migration has become a significant livelihood option across rural India (Singh, 2019). With declining agricultural incomes and rural households' inability to sustain themselves with farming alone, 'migrarian' livelihoods (migration and agriculture) form a crucial part of India's economy (Sharma et al., 2014). At household level, migration acts as an adaptation strategy for the poor to cope with climate, environmental and economic stresses. But migration disrupts family units (Ratha et al., 2011), and exploitation by middlemen can restrict or even nullify migrants' earnings. Disease and ill-health add to the risks of migration. The death of a sole earning member can put the entire family in hardship (Deshingkar and Start, 2003).

Effective social protection programmes can mitigate the pressures of distress migration by providing people with local livelihood options if they do not want to migrate. This is especially important as 'distress migrants' may be most disadvantaged in the urban labour market and may be exploited.

We also need to understand that those who stay back may not be better off compared to those who leave. Migrants may earn higher wages in urban destinations, allowing them to accumulate cash and buy assets back home to secure longer-term livelihoods and exit from intergenerational poverty, whereas if they stay back they may face food security issues and find it difficult to make ends meet. Migrants are often initially unskilled but develop their skills while at their jobs. Once they gain skills and establish themselves, they may bring their family members, including their spouse, to their workplace (CARIAA, 2019). So, for many, migration serves as an opportunity, where they would have otherwise fallen deeper into poverty traps. But it is a risky strategy, as although migration can bring more money, migrants have no social security to protect their incomes if they lose their jobs.

To reduce distress migration, the Government of India has a long history of running 'safety net' and adaptive social protection programmes. These aim to help rural communities increase agriculture productivity, develop alternative livelihoods and obtain wage employment through public works programmes during agriculture's lean periods or during climate extremes like droughts and floods. Some of the recent programmes are the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Pradhan Mantri Awas Yojana Gramin (PMAYG), the National Social Assistance Programme (NSAP), the Integrated Watershed Management Programme (IWMP), Jal Jeevan Mission (JJM), and National Rural Livelihoods Mission (NRLM). Their objectives are detailed in Table 2. But they do not adequately address seasonal migration[7] or distress migration[8] (Neupane et al., 2016).

BOX 1. CIRCULAR MIGRATION IS THE DOMINANT TREND FOR POORER GROUPS

Permanent migration is more common in educated groups seeking better livelihood options. In contrast, short-term seasonal migration is common among people with little or no education who take on unskilled jobs at destination sites. These migration trips vary in length from two to six months and have become an integral livelihood option for a large section of the rural poor, particularly in agriculturally underdeveloped regions. People migrate to urban destinations, industrial clusters/zones, into unorganised sectors such as stone quarries, brick kilns, construction sites and so on, and to more productive agriculture areas. However, migrants usually opt for non-farm employment as this yields greater returns and remittances, which play important roles in improving their overall household budgets.

[7] A migrant worker whose work or migration for employment is, by its character, dependent on seasonal conditions and is performed only during part of the year (Glossary on Migration, International Organization for Migration: https://publications.iom.int/system/files/pdf/iml_34_glossary.pdf).
[8] All migratory movements made in conditions where the individual and/or the household perceive that the only viable livelihood option for moving out of poverty is to migrate. Such distress is usually associated with lack of livelihood options, given the limited economic and employment opportunities, as well as drought, crop failure and food insecurity (FAO's definition cited in Avis, 2017: http://www.gsdrc.org/wp-content/uploads/2017/04/HDR1406.pdf , page 8)

Table 2. Social protection programmes in India that provide local employment and help people develop alternative livelihoods

SCHEMES	OBJECTIVES
Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA)	Provides 100 days of guaranteed wage employment annually per household in rural areas when demanded
Pradhan Mantri Awas Yojana Gramin (PMAYG)	Provides houseless people and those living in dilapidated houses with financial assistance for constructing a durable house
Integrated Watershed Management Programme (IWMP)	Public works to conserve and develop degraded natural resources like soil, vegetative cover and water
Jal Jeevan Mission (JJM)	Provides safe and adequate drinking water through individual household tap connections
Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)	Expands area under assured irrigation, improves on-farm water use efficiency, promotes water-saving technologies
National Mission for Sustainable Agriculture (NMSA)	Improves productivity, sustainability, profitability and climate resilience of agriculture by promoting location-specific integrated farming systems
National Rural Livelihoods Mission (NRLM)	Creates efficient and effective institutional platforms for the rural poor, enabling them to increase household income and improve access to financial services.
Mahila Kisan Sashaktikaran Programme (MKSP)	Improves capacities of women in agriculture to access the resources of various institutions and government schemes
Prime Minister's Employment Generation Programme (PMEGP)	Promotes employment opportunities through micro-enterprises in rural and urban areas

Earlier schemes like Sampoorna Gramin Rozgar Yojana (SGRY) and the National Food for Work Program (NFWP), which paid wages in the form of cash and as food grain, were welcomed by the rural poor, as they provided much-needed food security. But these schemes faced severe supply bottlenecks, struggled to keep food grains available when needed, suffered leakages (corruption) and did not give local people a role in planning what assets would be created through wage labour. At most, they generated 40 to 50 days of wage employment per year. This was not enough to alleviate distress migration. Then came the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). It guaranteed 100 days of employment to every rural household per year. Regular agricultural operations usually provide 150–180 days of employment, so MGNREGA is important in helping to fill the shortfall. The programme can also provide 50 days additional wage employment in areas affected by climate hazards like floods, cyclones, droughts and so on. The intention of creating MGNREGA was to create climate resilience and help vulnerable households cope and recover from such events.

Policymakers saw MGNREGA as an answer to distress migration and climate impacts. However, it has not lived up to expectations. Low wage rates, delayed payments, leakages, lack of assured work, and administrative delays in declaring drought (and so delays in providing employment during critical times) have all undermined its success. A study across rural India revealed that MGNREGA works still don't overcome long-term employment losses or adequately address distress migration. Besides, migration has the allure of higher urban pay (Neupane et al., 2016) compared with MGNREGA wages.

2

Research approach and methodology

There is mounting evidence that migration can reduce poverty and inequality, and contribute to climate risk management – it is increasingly being recognised as an important development and resilience strategy (Kothari, 2002; Deshingkar, 2006; Skeldon, 2005; Deshingkar and Akter, 2009; Hagen-Zanker et al., 2017; Bharadwaj et al., 2021). In this, the efficacy of MGNREGA is important in mitigating pressures of distress migration. However, there are several aspects of climate-induced short-term or circular migration, especially in combination with other economic factors, that are not fully understood. Without reliable data on the pattern of circular migration, policymakers can not recognise or address migrants' needs, issues and vulnerabilities. Even where distress migration occurs, it is also important to understand whether and how MGNREGA or similar programmes help those left behind tackle economic or climate crises.

This research aims to understand what drives migration, the patterns associated with it, and its issues and consequences, and provide broader policy recommendations to the MGNREGA programme to harness migration's advantages to help the community build resilience.

The paper will help policymakers understand the complexity and diversity of migration – and so ensure that MGNREGA interventions are optimal, inclusive, and fine-tuned to suit different communities and areas (both destination and source sites of migration).

It also investigates whether migration should actually be encouraged within MGNREGA guidelines. Could MGNREGA facilitate, rather than prevent, migration, supporting its advantages with basic entitlements and rights such as a minimum wage, decent working conditions, or work site facilities at preferred migrant destinations?

The key research questions explored through this study are:

1. What are the patterns of migration?
2. What are the underlying drivers of migration?
3. What are the issues and consequences of migration faced by communities?
4. Does MGNREGA act as an alternative to migration within the village?
5. How can MGNREGA be used to support or enable migration?

This study uses a household's migration decision-making methodology to explore patterns of migration. In addition, it considers avoided losses from climate hazards and gains from adaptive social protection schemes to understand households' future migration intentions and past migration trends (Black et al., 2011; Adger et al., 2021).

For any household, the decision to migrate involves weighing up risks from environmental degradation or resource scarcity as well as demographic and socioeconomic factors. Our migration decision model therefore encompasses all perceptions relating to the current situation, perceptions of future situations, and what migrants expect to achieve in potential destinations. People's expectations for the future depend on the uncertainty of environmental quality and

climate variability. Hence the environmental quality has also been integrated in the decision to migrate.

The unit of analysis is the household in three Indian states, Madhya Pradesh, Rajasthan and Uttar Pradesh, which are some of the Infrastructure for Climate Resilient Growth (ICRG) programme focus states. These states have witnessed a higher frequency of droughts and expansion of drought-affected areas since 1950. While climate models project an increase of mean monsoon rainfall in the future, they concurrently project an increase in the occurrence, severity and area under drought (Krishnan et al., 2020).

Each surveyed household resides within a rural setting where the main livelihoods have multiple points of climate sensitivity, especially relating to agriculture and livestock. We focused on the household as the unit of primary decision making for migration and considered a household as engaged in migration when at least one member had moved to another place of residence in the last two years. We modelled the intention to migrate based on a sampling design of migration-engaged and non-engaged households in the three focus states.

Our research explored: (1) how migration decisions are made, (2) how different perceptions affect future intentions, and (3) how climate and environmental risks affect the decision. We examined how well the intention to migrate in the future is explained by current perceptions of environmental degradation and household insecurity associated with climate and environmental risks.

The analysis used a binary logistic regression model to explore how future migration intentions (measured as yes/no answers to the question "Do you or other household members intend to migrate in the future?") varied as a function of 'perception variables'. (De Jong et al., 1985, 1996, 2006; Mumuni et al.,2014; Koubi et al., 2016).

We focused on perceptions of how environmental changes affect households' economic security because these capture issues such as loss of income, assets or livestock that bring about disruptive changes to land use or livelihoods. We first asked the respondents to answer if, over the past five years, they had experienced any changes in rainfall, temperature, flooding and drought. We then asked the respondents about the impact of these environmental hazards on their household's economic security (for example damage to crops, livestock, assets/equipment and loss of income). We also considered various socioeconomic factors that affect migration decisions. These were chosen based on a review of previous empirical research and were:

- Household size
- Age of the head of the household
- Education level
- Main livelihood occupation of the head of the household
- Total household income
- Whether family members or friends had migrated (ie did the household have information and a support network to enable migration)
- Loans taken
- Dependency ratio: the number of children (aged 0–14) or elderly people (dependents aged above 60).

More details of the methodology, sampling profile and analytical framework are provided in Annex 2 and 3.

3

Research findings

3.1 Patterns of migration

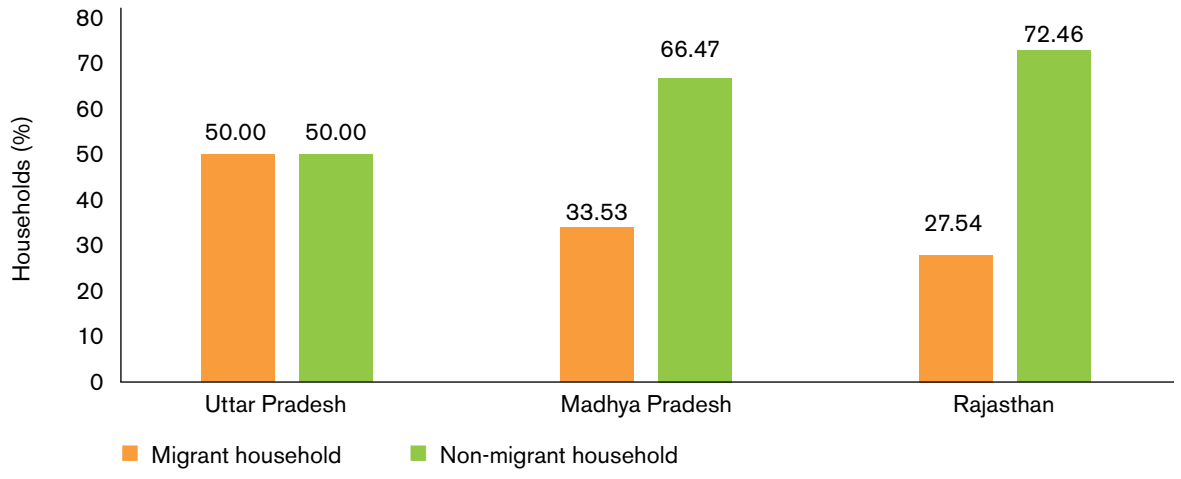
A total of 1046 households were surveyed in the three states, of which 37.0% have seen at least one member migrate in the past. The percentage of such households with migrants is highest in Uttar Pradesh (50.0%), followed by Madhya Pradesh (33.5%) and Rajasthan (27.5%).

More female-headed[9] households were engaged in migration than male-headed households, which indicates that it is mostly men who are migrating, and that women are taking on additional responsibilities as household heads.

The dominant nature of migration from the three states is seasonal[10] (61.4%). Men mostly migrate to major cities and different states once or twice a year, depending on the season. Poor returns from agriculture and fisheries trigger migration for alternative remunerative livelihoods.

Demographic factors are important in people's decision making with regard to migration. More male migrants

Figure 1. Percentages of migrant households and non-migrant households in three states



[9] The household head is the person who has the authority and responsibility for household affairs. If the usual household head has migrated, then the new head is the person who has the most influence over household affairs in their absence, or who earns the most income.
[10] Seasonal migration describes the movement of a household member(s) from the sending area based on seasonal conditions (adapted from World Migration Report 2015). For the purposes of this survey, this movement is temporary (of less than six months' duration) and carried out once or twice within a 12-month period.

are aged 21–30 compared with other age groups. Furthermore, household heads with no education or basic education have more intention to migrate than those with secondary and higher education. In the case of female migrants, their intention is highly dependent on the household decision.

Most migrants move seasonally from the study areas to major cities in Maharashtra, Gujarat and Delhi states (see Figures 2, 3 and 4). Those migrating to other rural areas usually work in brick kilns or cotton fields of neighbouring states like Maharashtra and Gujarat.

Migrants send remittances once every month or every two to three months. More than half of the remittances, regardless of their frequency, are up to ₹5000. They are used in the village mainly to meet daily consumption needs (food, daily necessities), and to some extent, for healthcare and education and to buy household goods (household appliances, furniture and garments).

Table 3. Patterns of migration from Uttar Pradesh, Madhya Pradesh and Rajasthan

RESPONSES			UTTAR PRADESH (%)	MADHYA PRADESH (%)	RAJASTHAN (%)	TOTAL (%)
Type		Seasonal migration	69.3	65.9	40.4	61.4
Frequency		1–2 times	95.5	91.3	97.2	94.7
Duration		Less than 6 months	67.7	63.3	41.7	60.3
Scale		Inter-state migration	37.6	23.1	32.2	32
Destinations		District capital	22.8	27.9	51.7	31.1
		State capital	2.2	3.9	10.6	4.7
		Other state's capital	37.6	23.1	32.2	32
		Major city	37.3	45	5.6	32.2
Reasons	First	Seeking employment	94.4	95.2	90.6	93.8
	Second	Family obligations / problems	25.1	14	8.3	17.8
	Third	Drought	8.1	8.3	28.3	12.9
Remittances	Type	Money	67.7	59.4	47.8	60.5
	Amount	₹5000 and below	51.4	46.3	61.6	51.8
Uses of remittances	Rank-1	Daily consumption (food, bills)	94.7	97.1	82.6	93.1
	Rank-2	Healthcare	30.9	30.9	9.3	26.9
	Rank-3	Household items (furniture, TV, clothes etc)	14.8	29.4	18.6	19.8

Figure 2. Inter-state migration from Uttar Pradesh

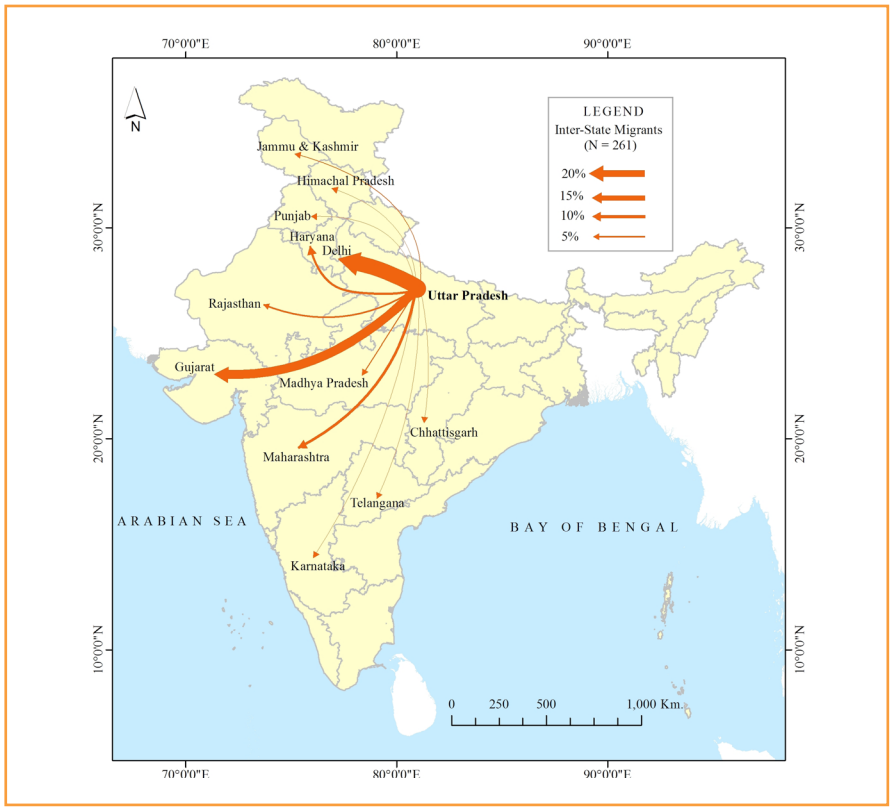


Figure 3. Inter-state migration from Madhya Pradesh

Figure 4. Inter-state migration from Rajasthan

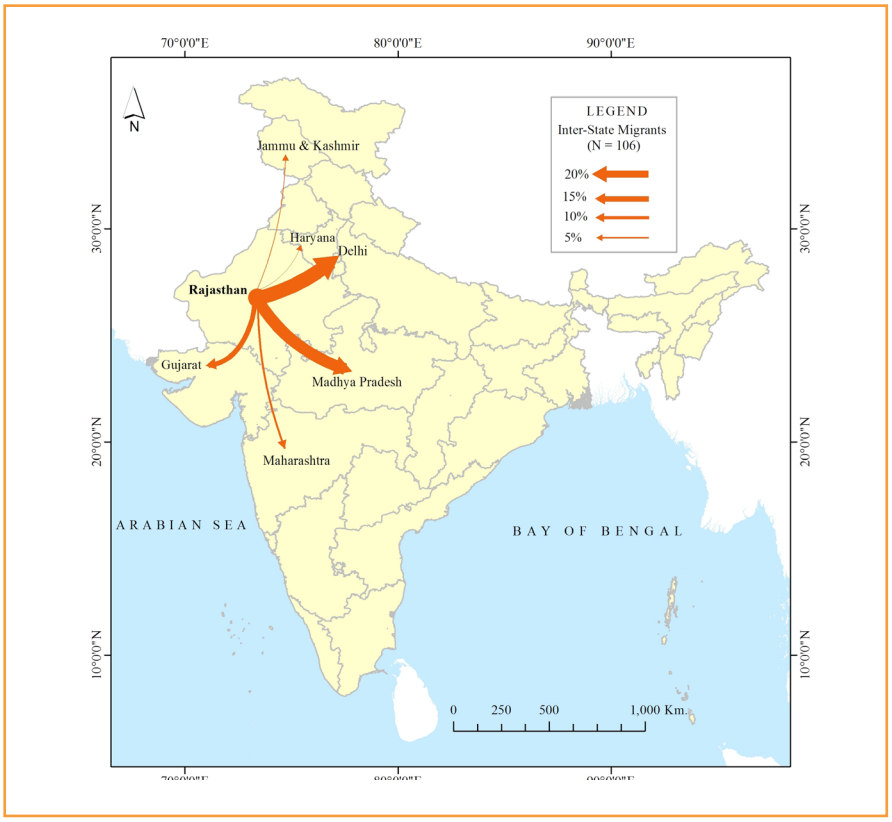
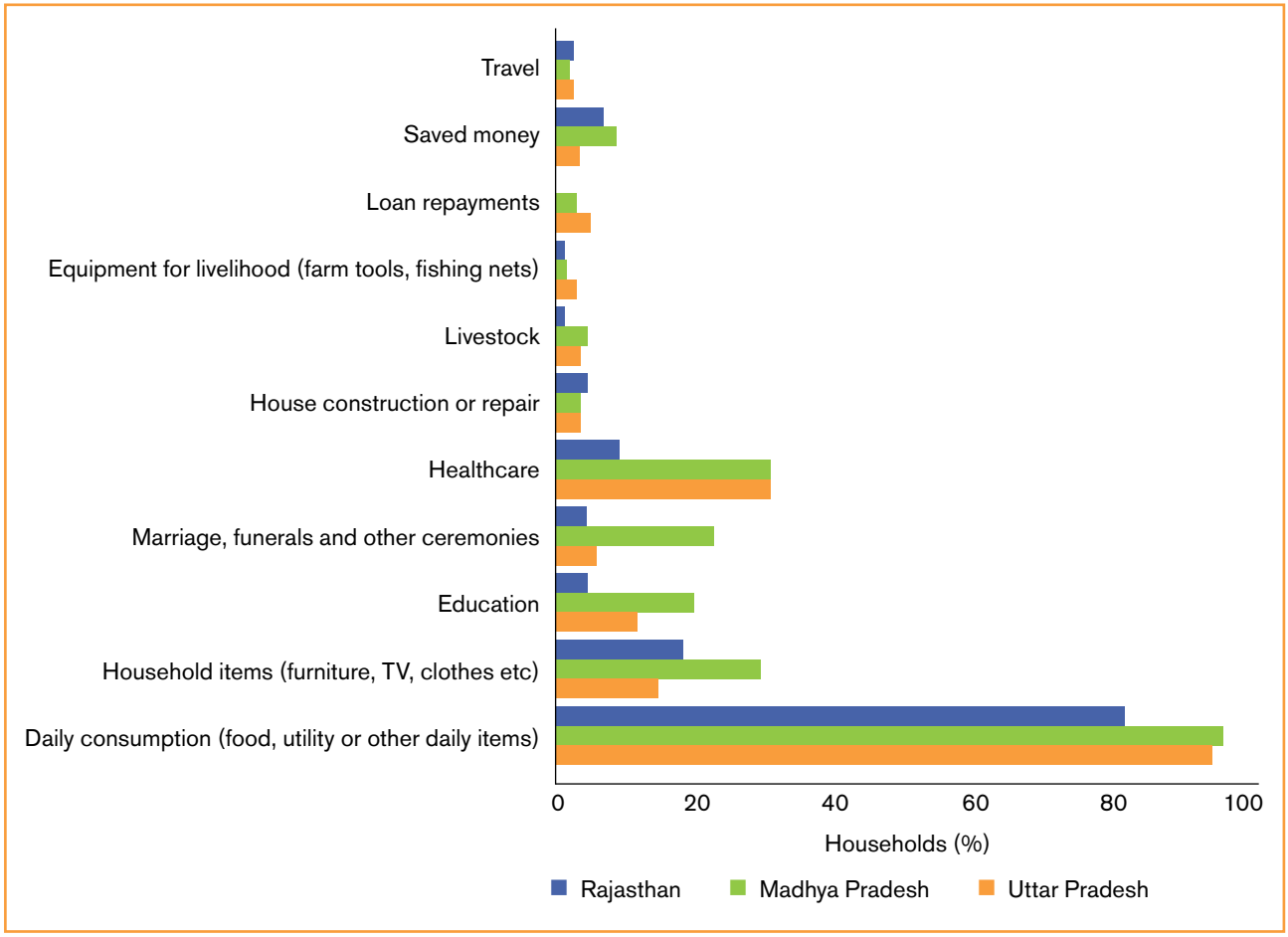


Figure 5. Uses of remittances in the three states



3.2 Perceived drivers of migration

Almost 94% of households reported that the main reason behind migration is economic, with most migrants moving in search of better employment opportunities. The second most frequently mentioned reason was family obligations (17.8%) (Table 4). Female migrants mostly move to join their spouse or for marriage.

As many as 35% of respondents in Uttar Pradesh reported that they were not working in their own villages due to climate shocks. Lack of local livelihood options and better income sources outside the village were the main reasons for people not working in their own villages in Madhya Pradesh and Rajasthan.

The key information networks on employment opportunities at destination sites are mainly family and friends who migrate to these areas. Intermediaries setting up work and shelter are less prevalent.

Figure 6. Main reason for not working in villages

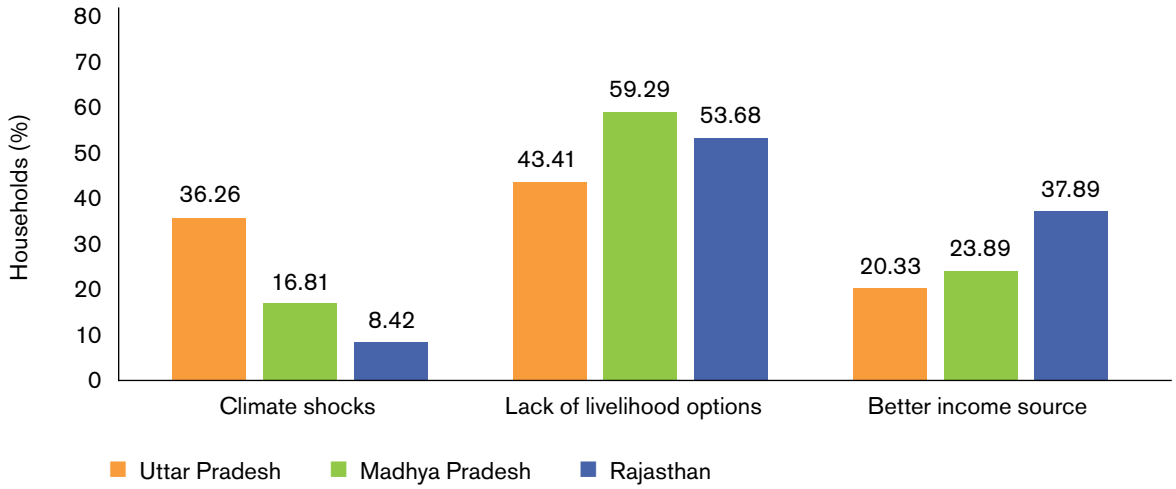


Figure 7. Reasons for preferring destination areas

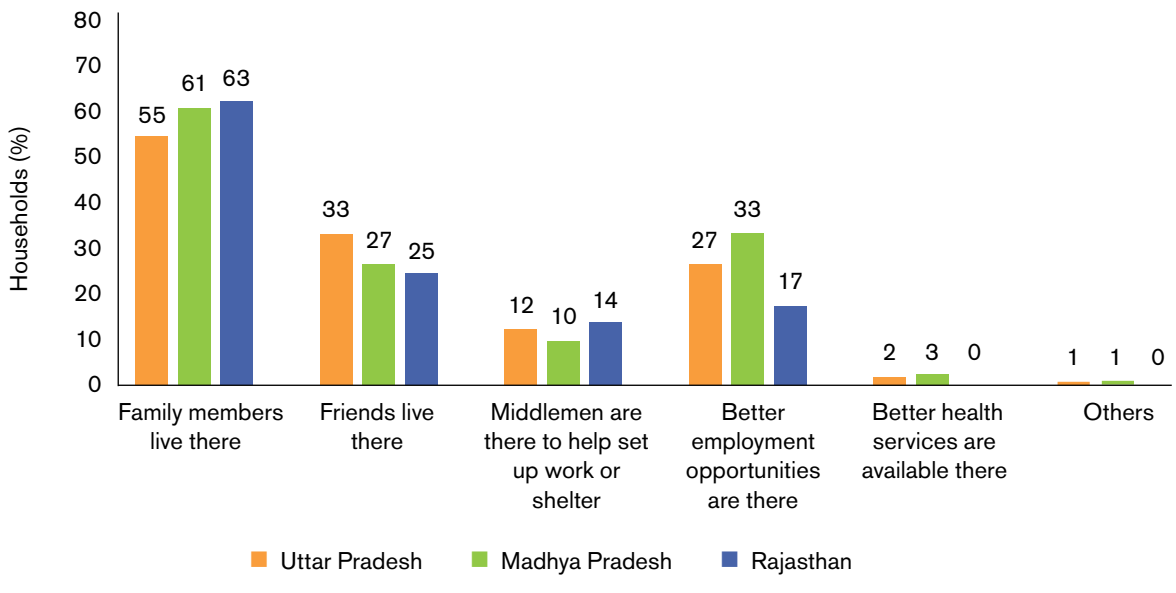
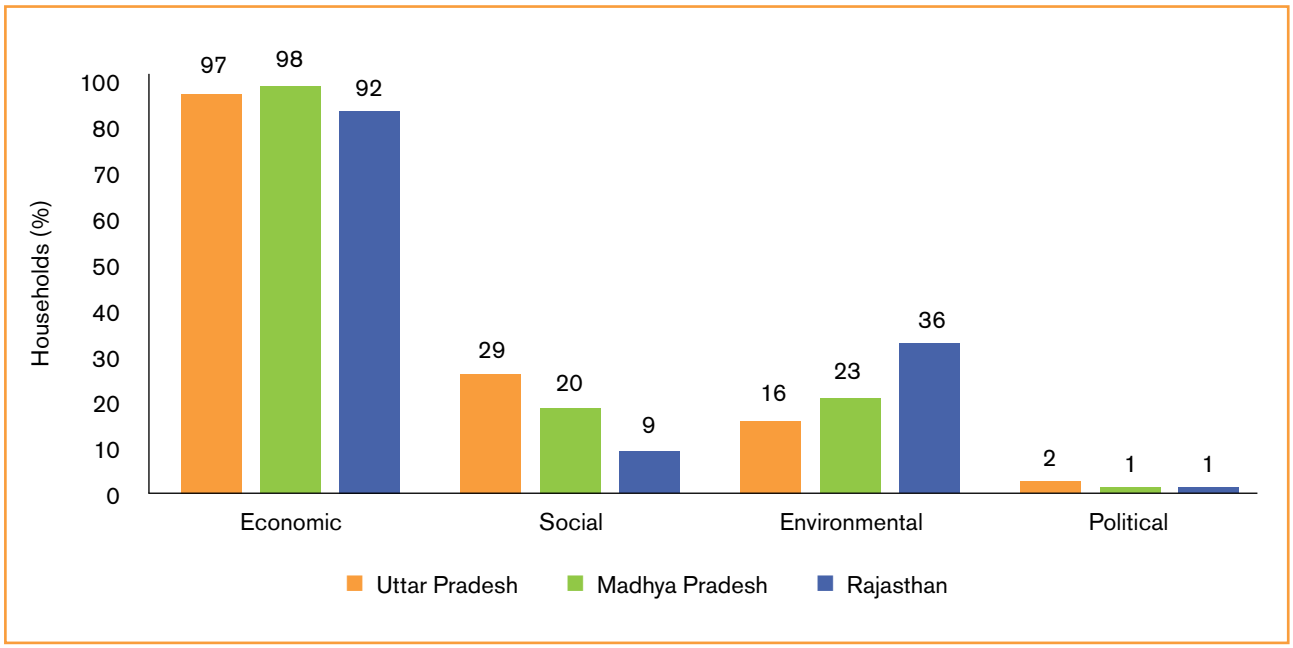


Figure 8. Reasons for migration in three states



Although climate issues mostly act as a stress multiplier to already existing socioeconomic and political factors, a small percentage of the respondents directly attributed the decision to migrate to an environmental stressor.

From the study on perceptions of environmental risks as reasons for migration decision making, it emerged that drought and land degradation act as 'stressors' and motivate individuals/households directly to consider migration as a survival strategy.

Table 4. Environmental reasons for migration

	PERCENTAGE OF HOUSEHOLDS REPORTING			
ENVIRONMENTAL REASONS	UTTAR PRADESH (%)	MADHYA PRADESH (%)	RAJASTHAN (%)	OVERALL (%)
Loss of income in one season	5.57	7.42	1.67	5.21
Loss of income in multiple seasons	1.11	5.24	2.22	2.60
Drought	8.08	8.30	28.33	12.89
Flood	0.00	0.44	0.00	0.13
Hailstorms/heatwaves/storms	0.00	0.87	0.00	0.26
Land degradation	1.67	0.44	3.33	1.69
Total	16.43	22.71	35.56	22.79

3.3 Underlying drivers of migration

Empirical literature suggests that household size, age, sex, the education of the household head and household income all influence migration intention (De Jong et al., 2006; Mumuni et al., 2014; Tan, 2017). For example, according to the literature, older individuals are typically less likely to migrate and educated people are more likely to do so. Social networks increase the likelihood of migration to particular destination sites by reducing the costs and risks associated with it.

Migration intention is also driven by the respondents' recollection of environmental changes (rainfall, temperature) experienced within the most recent five years, and the self-reported impact of environmental hazards (drought, flood, hailstorm, heatwave) on the household's economic security (loss of income, assets or livestock, bringing about disruptive changes to land use or livelihoods).

More than 30% of the respondents reported that someone in their household intends to migrate in the next two years. The average age of household heads in the study areas combined is 44.59 years, which is younger than the national average age for rural India.

Table 5. Percentage distribution of variables known to influence the intention to migrate

VARIABLES	UTTAR PRADESH	MADHYA PRADESH	RAJASTHAN	OVERALL
Household member intends to migrate	40.90%	30.86%	20.87%	31.07%
Household size (mean)	4.91	5.05	5.02	4.99
Household head is male	78.00%	87.24%	76.20%	80.40%
Age of household head (mean)	44.7	44.89	44.18	44.59
Education of household head				
No education	71.70%	62.90%	53.30%	62.80%
Primary education only	7.40%	8.60%	12.50%	9.50%
Secondary education	10.40%	15.10%	21.70%	15.70%
Higher education	10.40%	13.40%	12.50%	12.00%
Main livelihood of household head				
Crop farmer	45.30%	83.70%	58.00%	61.90%
MGNREGA	35.70%	0.30%	22.30%	19.90%
Others	19.00%	16.00%	19.70%	18.30%
Household monthly income (₹)(mean)	5067.97	7902.78	5969.13	6278.52
Outstanding loan	21.70%	17.20%	18.80%	19.30%
Migration network	50.00%	33.50%	27.50%	37.30%
Drought	78.00%	49.30%	100.00%	76.00%
Flood	14.30%	56.10%	0.00%	23.00%
Hailstorm	21.40%	2.70%	0.00%	8.30%
Heatwave	0.30%	0.30%	0.30%	0.30%

In all the states, male household heads (80%) are more common than female household heads. This is consistent with national data where around 89% of household heads are men. Survey data shows that the education level is very low in the study areas. Almost 70% of the respondents had no formal education with the remaining having attained only primary or lower education. These low levels of education will make migrants less competitive in the economic sector, making it harder to secure their household finances, especially in times of climate-related hardship.

Households have approximately five members on average. This is higher than the national average of 4.4. Generally, the levels of income are low in Uttar Pradesh and Rajasthan. Survey data shows that nearly half of the respondents had an annual income below the national minimum wage (₹4,576 (US$62) per month). Across the study areas, 37% of the households contain at least one member who has migrated in the past.

Climate-related extreme events are among the significant stressors mentioned by household heads in all the states. Of the 1046 households, 70% of the respondents indicated that drought/irregular rainfall is a significant stressor. In addition, 23% mentioned flood as a significant stressor, while 8.3% mentioned hailstorms.

In our analysis of intention to migrate as influenced by respondents' perceptions of socioeconomic and environmental variables (using binary logistic regression models), we find the following broad results:

- Household size, age of household head, education level and monthly household income are the most significant socioeconomic variables that can trigger migration responses at the household level.
- Climatic events like drought, flood and hailstorms act as 'stressors' and drive individuals/households to accept migration as a survival strategy. In the regression model climate-related stressors explain about 3% of the variations in the decision to migrate.
- However, when socioeconomic factors are combined with climate stressors, these explain 13% of the variation in the decision to migrate. This indicates that climate change acts as a stress multiplier to socioeconomic issues already being faced by households.

The results of the regression can be seen in Table A3.3, Annex 3 and are interpreted in the next section.

3.3.1 Socioeconomic variables

Household size: This influences how the household will be able to cope in times of climate-related extreme events. Large households are often considered more vulnerable than smaller households. However, larger households might be able to diversify their source of income more easily by sending one of their members elsewhere. Household size increases the intentions to migrate by 1.15 times. It can be said that **increasing household size increases the intention to migrate.**

Age of household head: This is also an important factor in migration decision making. Older household heads may be more attached to their home village than younger household heads. Results indicate that **households with older household heads have less intention to migrate.**

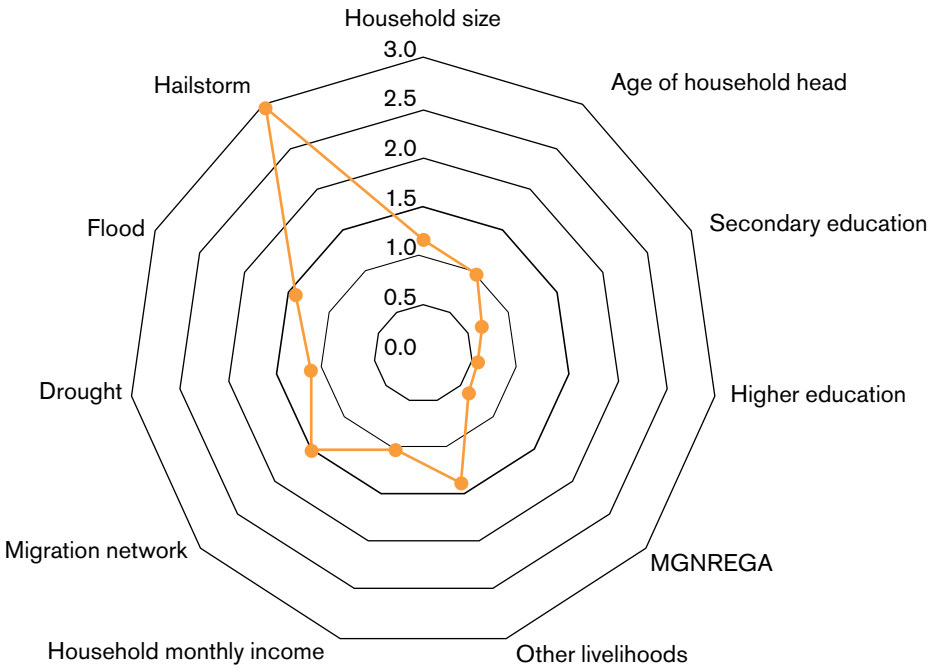
Education: The educational level of the head of the household influences the level of information available to the rest of the household and their ability to prepare for climate-related extreme events. **Households where the household head has no education have more intention to migrate than those who have completed secondary and higher education.**

Livelihood: Crop farmers are affected more by hazard events and climate variability than other workers. Households associated with MGNREGA have less intention to migrate than those associated with farming alone.

Migration network: This plays an important role in migration decision making. The results indicate that the presence of a network of family and friends who have already migrated plays an important role in migration decision making.

Household income: Households that have the financial resources will be able to support members to embark on migration. In contrast, those who do not have the financial resources may opt for other coping methods.

Figure 9. Significant variables in migration decision making (the numerical values show how many times the intention to migrate is increased by the variable)



3.3.2 Climate-related events

Drought: The alarming increase in the frequency of droughts is a common trend in all three drought-prone states. More than 70% of the households in these study regions said that the frequency of droughts had increased significantly in the past five to ten years. The results indicate that households exposed to drought are more likely than those who are not exposed to have the intention to migrate.

Flood: Households that are exposed to flood are more likely than those who are not exposed to have the intention to migrate (Table A3.4).

3.3.3 State-level analysis

Uttar Pradesh: Household size, the age of the head of the household, the level of education, work under MGNREGA, household monthly income and the presence of a migration network are the significant socioeconomic variables that influence migration decision making. Uttar Pradesh has experienced significant flooding over the last ten to 15 years. During the monsoons, heavy rains regularly flood the villages that lie on the riverbanks. The model reveals that exposure to drought, flood and hail have a positive effect on the intention to migrate. It can be said that climatic events like drought, flood and hailstorm act as 'stressors' and drive individuals/households to consider migration as a survival strategy in Uttar Pradesh.

Madhya Pradesh: Household size, age and education level of household head, work under MGNREGA, and household monthly income are the significant socioeconomic variables that can trigger migration responses at the household level. The model shows that exposure to drought has a positive effect on the intention to migrate, but socioeconomic factors play an important role in migration decision making in Madhya Pradesh.

Rajasthan: Household size, the age of the head of the household, work under MGNREGA, household monthly income and the presence of a migration network are the significant socioeconomic variables that affect natural resource-based livelihoods and influence migration decision making. The model shows that exposure to drought has a positive effect on the intention to migrate. It can be said that both climate and socioeconomic factors play a role in migration decision making in Rajasthan.

Our results indicate that in all the states, most household heads perceive climate-related extreme events as their most severe stressor. This is because agriculture, which is people's main livelihood, depends on climate. Irregular rainfall, drought and flood adversely affect agricultural production.

Figure 10. Percentage of households that migrated immediately after extreme events

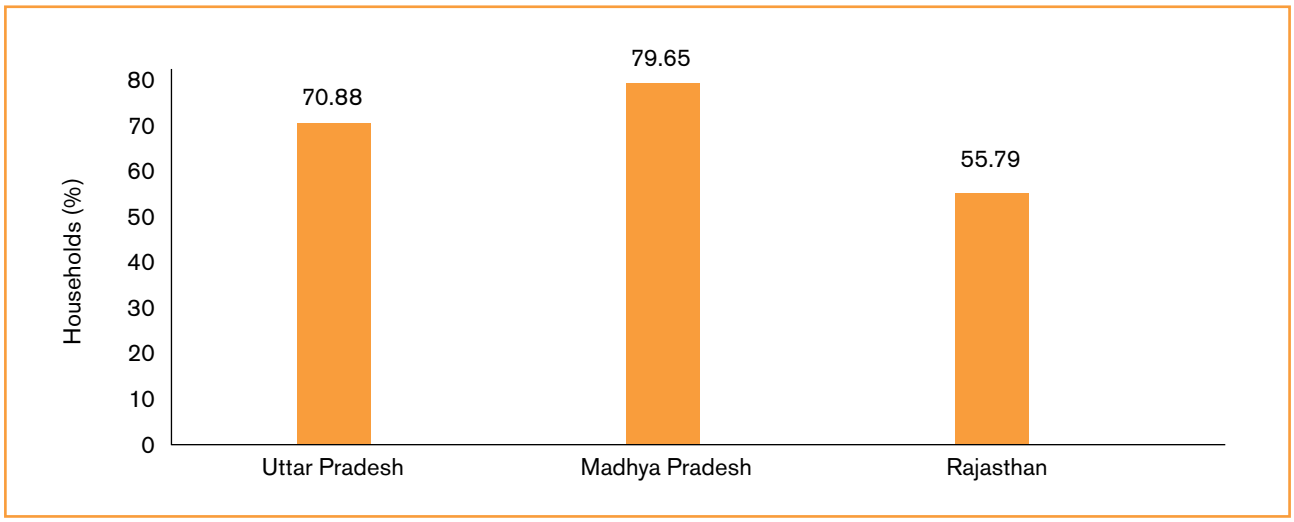


Table 6. Climatic events and MGNREGA in migration decision making

		PERCENTAGE OF HOUSEHOLDS			
RESPONSES		UTTAR PRADESH (%)	MADHYA PRADESH (%)	RAJASTHAN (%)	TOTAL (%)
Decision to migrate after calamity due to MGNREGA related issues		64.84	59.29	45.74	58.61
Issues	Work available but didn't get work under MGNREGA	**49.15**	**52.24**	**50.00**	**50.22**
	Work not available under MGNREGA	22.88	35.82	29.55	27.95
	Did not get sufficient number of working days under MGNREGA	27.97	11.94	20.45	21.83

The table is based on primary data. The question was "Does your decision to migrate after calamity have anything to do with MGNREGA issues?"

Almost 60% of households migrate after a natural calamity because of problems in accessing work under MGNREGA. Fifty percent of households do not get work even when it is available under MGNREGA. Twenty-eight percent report no work under MGNREGA, while almost 22% feel that the number of days of employment is insufficient for their needs. The study area witnessed slow-onset events like droughts, which take a long time to unfold. Consequently, it will take a long time to understand the impacts of migration on socioecological systems.

3.4 Issues and consequences of migration

Migration can improve the social and economic status of migrants and migrant households. More than 65% of respondents said that migration is helpful for migrants and somewhat helpful for family members.

Overall, about 31% of households intend to migrate in the future. Respondents who do not intend to migrate said that the fear of leaving their family unprotected and family commitments are barriers to migration.

Around 80% of the respondents said that migration improves migrants' economic security, education and work opportunities. It also enables them to bring new ideas and practices back to the village. Thus, the exchange of ideas, knowledge and money between the migrants' place of origin and their destinations, if managed properly, can reduce the socioeconomic and biophysical vulnerabilities of the community.

The impact of migration is dependent on who migrates, who stays behind and the reasons therein. Migration helps an individual to improve their quality of life. Since the migrant person learns about the culture, customs and other languages at their destination, it also helps improve their social network. It has also been observed that the skilled migration population is progressing the region's economic condition (Haque et al., 1995). Migration has positive and negative impacts on human development and specifically on women. When men migrate, it brings in remittances that may improve living standards for those staying behind and for women-headed households. Learning

Figure 11. Percentage of households reporting whether migration is helpful or unhelpful

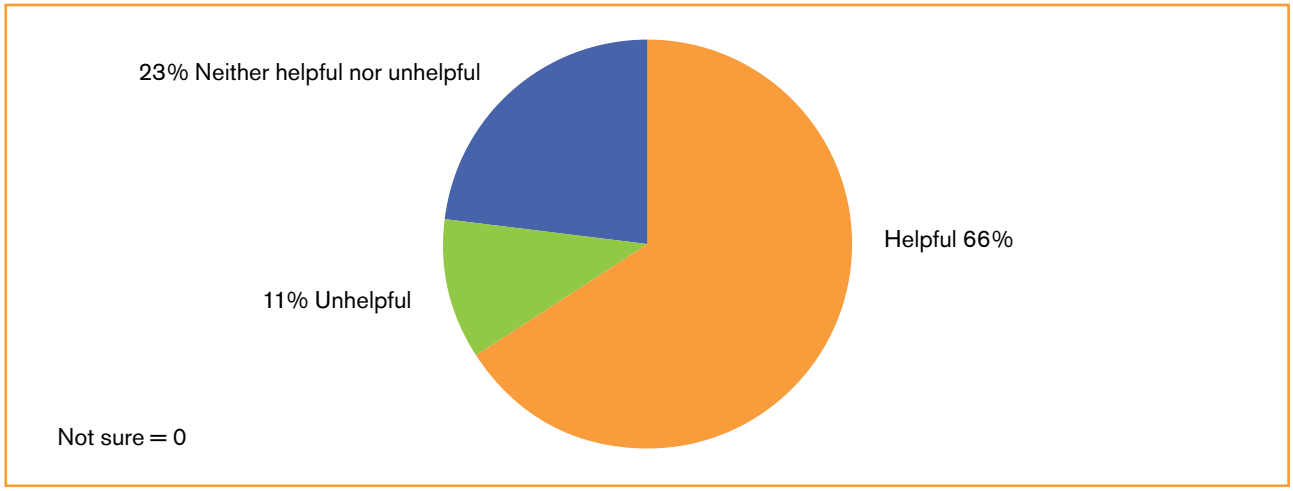
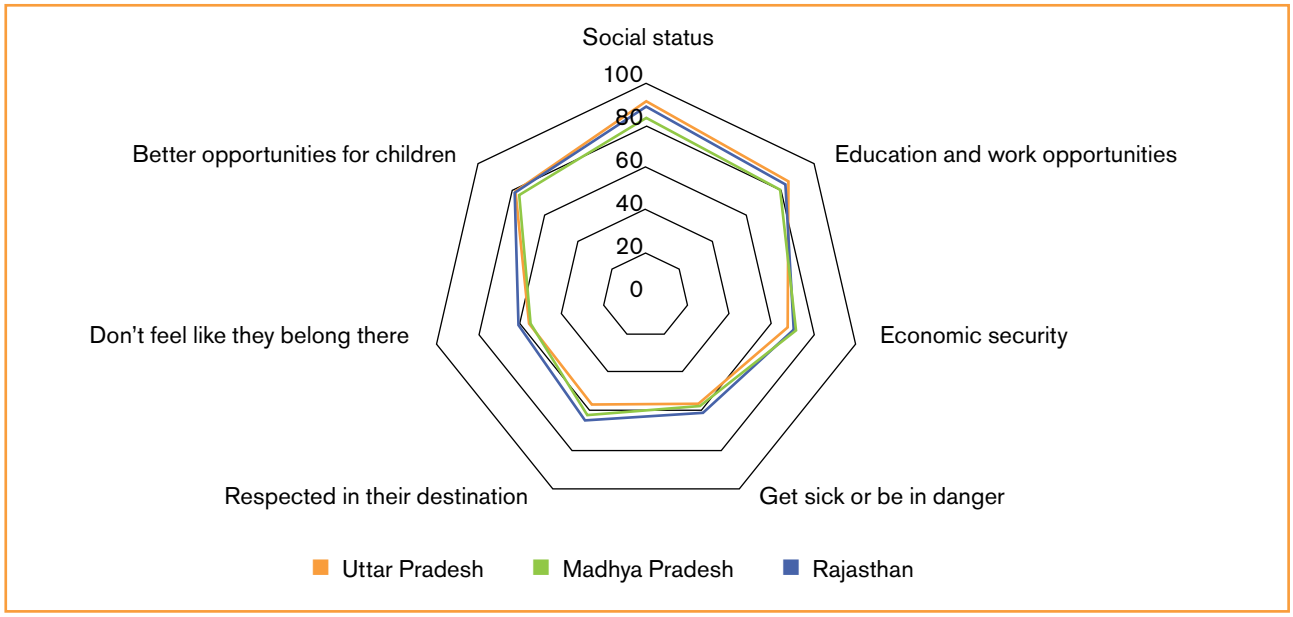


Figure 12. Impacts of migration on migrants (percentage of households reporting)



of new skills and an improvement in socioeconomic status can also occur when women themselves migrate. On the other hand, migration brings the risk of injury, exposure to life-threatening diseases, loneliness and increased workloads for women left behind. Migration may negatively impact the family because the number of working individuals is reduced at the origin. Moreover, since migration does not ensure instant employment at the destination, it can lead to reduced income (ie expenditure without an inflow of money) for the family, and sometimes the family has to finance the migrant (Antman, 2013). In the long run, migration may have a significant economic impact on the home country. The effect may be either positive or negative and this depends on skill, remittances and growth. If any country is losing people due to economic reasons, policy-level changes are required to improve the situation (Drinkwater, 2003).

Migration can leave very few young people in the village, reducing the community's capability to face slow- or rapid-onset climate hazards and adversity. Over 21% of households in Rajasthan expressed the intention to migrate. In Madhya Pradesh and Uttar Pradesh, it was 31% and 41% respectively. Overall, the survey indicates that migration in the villages will increase in the future, leaving behind more female-headed households to cope and adapt in situ to climate change and climate disasters.

The results of the regression can be seen in Annex 2.

Figure 13. Impacts of migration on household and village (percentage of households reporting these issues)

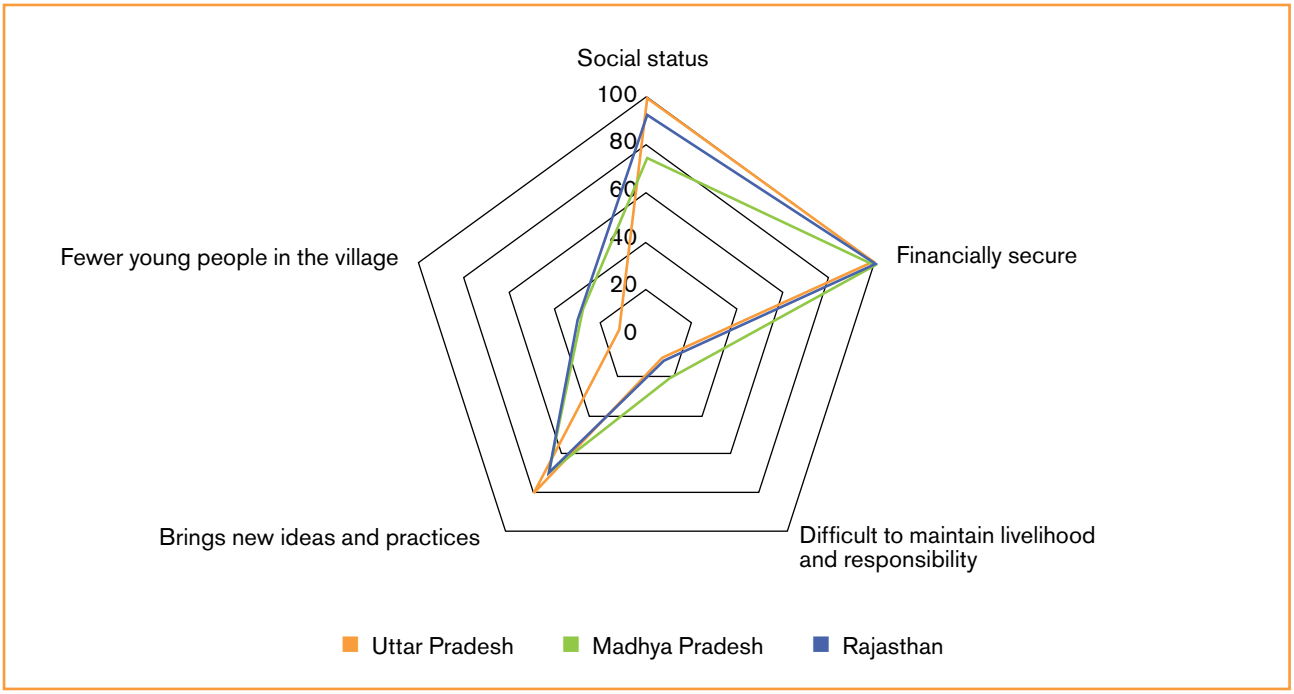
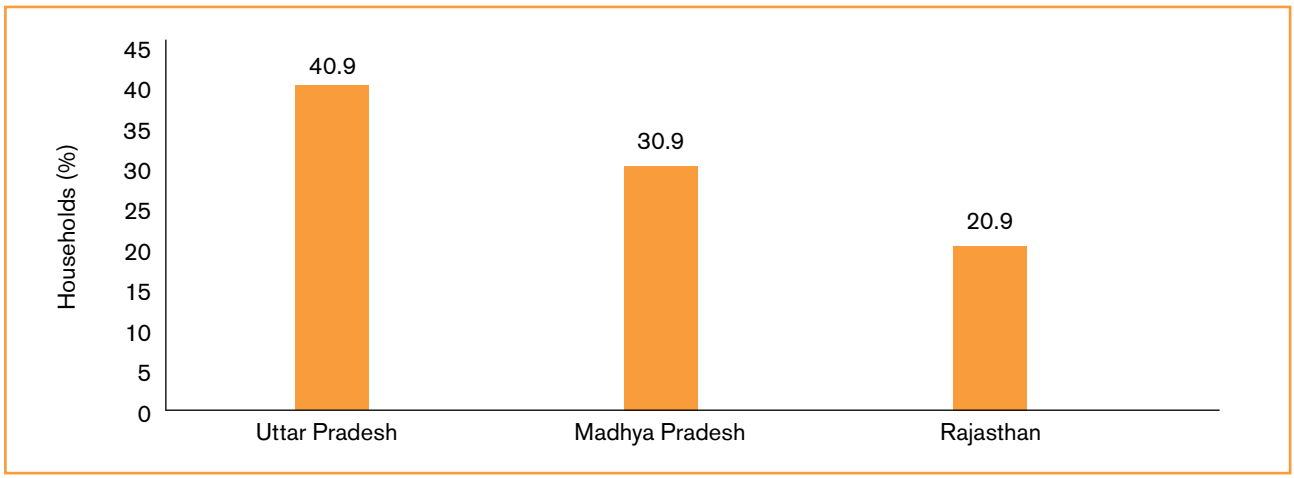


Figure 14. Intention to migrate in the three states



3.5 MGNREGA as an alternative to migration

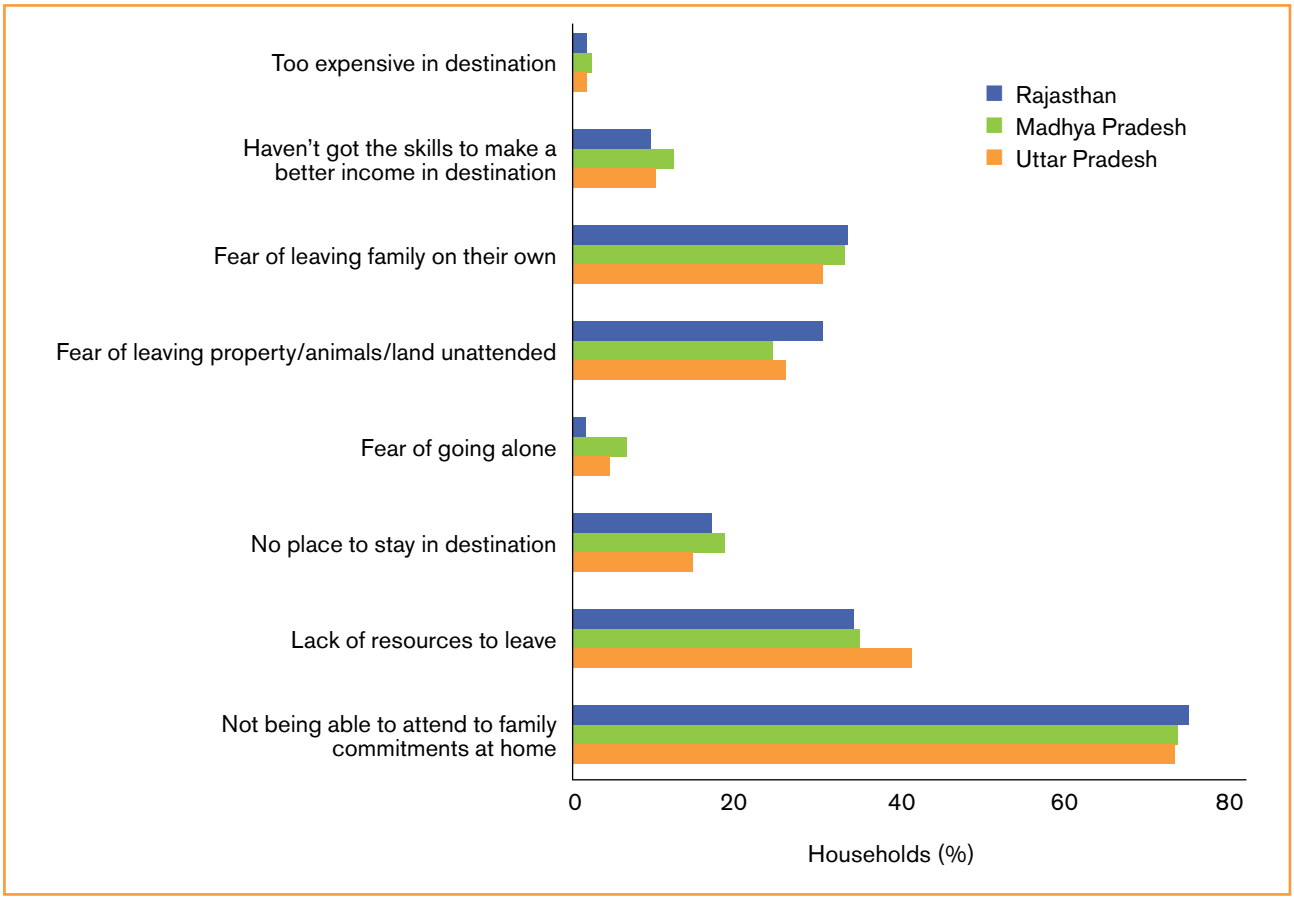
The survey data shows that 68.03% of households do not intend to migrate in the future. Fear of leaving their family unprotected, family commitments and lack of resources to leave are barriers to migration.

Most of the respondents (over 94%) are under economic stress due to their current income levels. A large proportion cannot buy enough food and non-food essential items, pay for healthcare or send children to school. They require between ₹5001 and ₹10,000 per month to prevent feeling under stress/pressure. More than 75% of households are working longer hours to augment their income.

MGNREGA can act as an alternative prospect within the village in lieu of migration. MGNREGA gives an opportunity for wage employment on demand to people in rural areas through their Panchayati Raj Institutions (PRIs).[11]

All the participants were aware of MGNREGA and its provision for 100 days of work. Wage rates under MGNREGA, as reported by the participants, were ₹201 in Uttar Pradesh, ₹190 in Madhya Pradesh, and ₹220 in Rajasthan for the work equivalent to one full person-day.

Figure 15. Barriers to migration in the three states



[11] India has devolved considerable powers to local self-government institutions in rural areas, which are known as Panchayati Raj Institutions (PRIs). These have a three-tier structure with Gram Sabha and Gram Panchayat as the basic units, which are usually at the level of a village or cluster of villages according to their population. Panchayati Raj Institutions are the principal authorities for planning and implementation of MGNREGA. At least 50% of the cost of works under MGNREGA have to be implemented through Gram Panchayats.

Table 7. Income thresholds in Uttar Pradesh, Madhya Pradesh and Rajasthan

THRESHOLDS		UTTAR PRADESH (%)	MADHYA PRADESH (%)	RAJASTHAN (%)	OVERALL (%)
Under stress due to current income		**94.23**	**91.69**	**97.39**	**94.46**
Require to prevent feeling under stress/ pressure	Up to ₹5000	19.78	17.51	14.49	17.30
	₹5001–10000	43.68	39.17	45.22	42.73
	₹10001–25000	36.54	43.32	40.29	39.96
Signs	Cannot buy sufficient food	62.97	66.67	82.74	70.85
	Cannot buy non-food essential items	**88.92**	**93.85**	**98.51**	**93.72**
	Cannot send children to school	33.24	60.84	70.24	54.45
	Cannot pay for healthcare	54.23	46.28	53.27	51.42
	Don't know	49.85	31.72	30.06	37.45
	Borrowing money	10.79	9.71	5.95	8.81
	Selling assets	0.58	4.21	0.60	1.72
	Spending savings	11.66	7.12	2.38	7.09
Actions taken to increase household income	Work longer hours	**64.14**	**73.46**	**93.45**	**77.02**
	Send migrant(s) away	5.83	6.47	0.00	4.05
	Migrate to look for work elsewhere	21.57	16.83	4.76	14.37
	Change/diversify livelihood	7.29	3.24	1.79	4.15
	Others	0.29	0.00	0.00	0.10

The impact of MGNREGA on people's lives

Some of the impacts of MGNREGA reported by respondents are:

Additional income: MGNREGA provides work opportunities locally, and women workers take advantage of it, as they can manage household chores and earn as well. This opportunity offers the choice to women or their family to stay and not migrate if they do not want to. This practice is more prevalent in Rajasthan, where women account for 80% of person-days of employment generated in the study year. In Uttar Pradesh women's participation in MGNREGA is also high across all Gram Panchayats, while in Madhya Pradesh, especially in the tribal pockets, women did not participate in MGNREGA at all.

Alternate livelihood options: MGNREGA assets have helped in improving agriculture productivity and also helped develop allied sources of livelihoods. In Balaser Block, Jodhpur district of Rajasthan, livestock rearing has been introduced by the community due to pasture development through MGNREGA. Similarly, in Sondwa Block, Alirajpur district, Madhya Pradesh, the community is rearing fish due to the construction of ponds, and plantations also provide additional income.

Ensuring drinking water facilities: Underground water tanks have been built through MGNREGA in Rajasthan. These tanks store water through rainwater harvesting and have the capacity to store enough water for a year per household. These tanks have been a great relief and provide drinking water security for families in the village. This helps them save the time they would typically spend in fetching water from long distances and also the money that they used to spend in buying water from tankers when nearby sources dried up. However, people who do not have an underground storage tank facility buy drinking water that often costs them ₹500 to ₹700 for a smaller portable tank, which lasts for a week at most.

Provision of water for animals and irrigation: Similarly, water storage structures like ponds helped store water for at least three to four months after the seasonal monsoons. In Rajasthan, they dried up much faster than in the other two states due to extreme heat and high percolation in sandy loam soil. In Uttar Pradesh and Madhya Pradesh, the pond water lasts up to February or March every year after the monsoon season.

In Madhya Pradesh and Uttar Pradesh, these ponds are used for irrigation purposes, but in Rajasthan, very few ponds are built and are generally used for animals.

Development and maintenance of community-level assets: Apart from income generation through labour in asset-building activities under MGNREGA, various assets and structures such as roads, anganwadi centres, cemeteries and drainage have been built. Across the states, people reported that such community structures created under MGNREGA have been very useful for them.

Soil moisture conservation and groundwater recharge: On-farm soil moisture conservation activities and contour trenches in upper areas have reportedly helped to increase the groundwater levels in many Gram Panchayats in Madhya Pradesh (Khamat, Odjar and Rai). The majority of the villages in this state are drought-prone despite heavy rainfall.

Participatory planning: Nearly half of the Gram Panchayats in Uttar Pradesh and almost two thirds of those in Madhya Pradesh reported that they were able to participate in planning MGNREGA works.

3.6 MGNREGA to support or enable migration

MGNREGA provides an additional 50 days of employment under MGNREGA to drought-affected areas. IIED's previous research shows that delays in formally declaring drought are one of the key reasons respondents give for not being able to avail these additional days, forcing communities to undertake distress migration (Steinbach et al., 2020)

Migrants mentioned that at destination sites they do not find work on all days and stated that it would help them if MGNREGA work was available to them during these periods. However, they wanted the wages to be on a par with city wage rates as the cost of living at the destination was higher. Respondents across all states made this request.

MGNREGA's 'Unnati' project will train one adult per household (aged 18–45 years), provided the person has completed 100 days of work under MGNREGA in the previous financial year. However, most of the family members are not able to complete 100 days of employment because the full amount is not available. Almost 35% of households reported getting only up to 25 days' work. Almost 60% of households reported getting only up to 50 days' work. But over 95% of households felt they needed to get more than 100 days' work. In some Gram Panchayats in Uttar Pradesh, people reported that they have obtained wage employment under MGNREGA after almost five years without.

Demand for wage employment through a written application was found in Rajasthan, but this was completely absent in Uttar Pradesh and Madhya Pradesh. A process for demanding additional wage days in case of extreme climate events was missing in all three states. Participants were almost entirely unaware of this provision under MGNREGA. Out of all respondents, only one in every ten reported being aware of it.

Figure 16. Percentage of people interested in working within MGNREGA at migration destinations

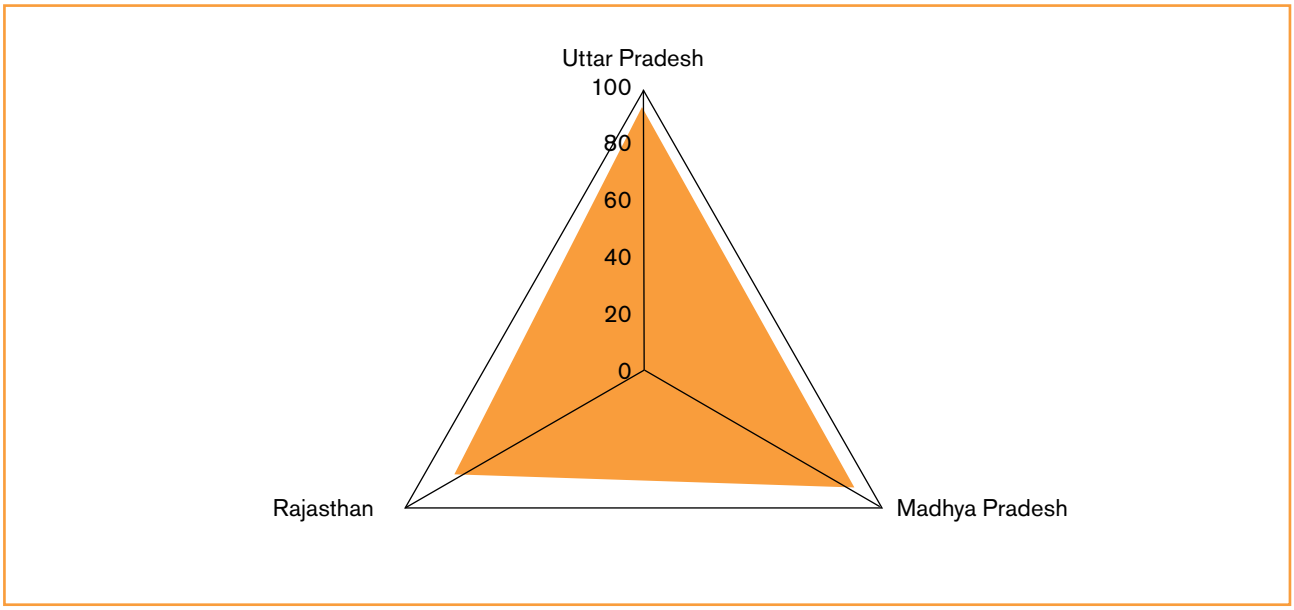


Figure 17. Percentage of households that have developed new skills through MGNREGA work

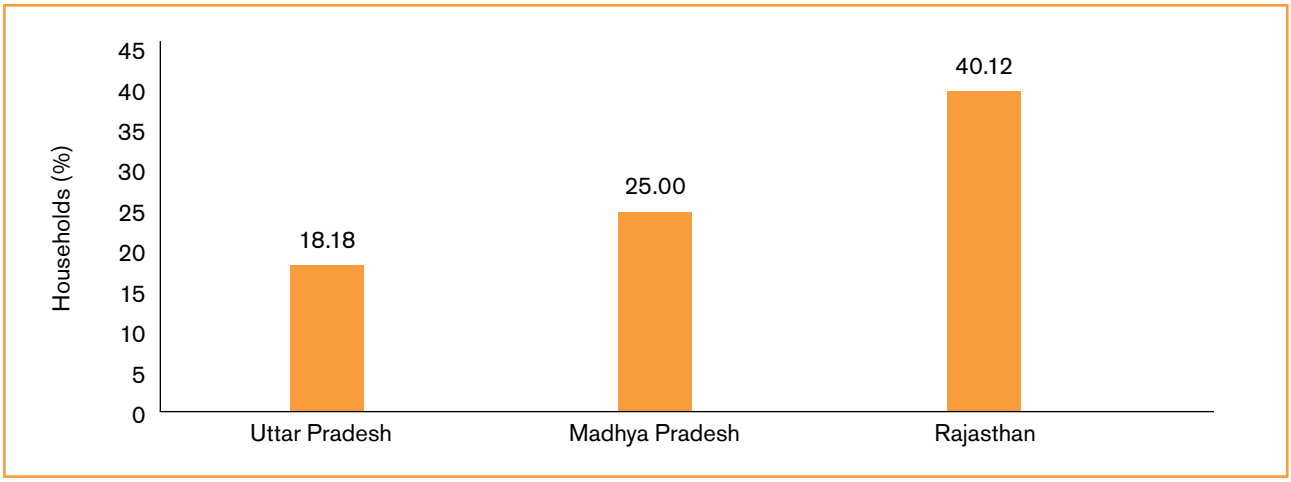


Table 8. Availability of work under MGNREGA in Uttar Pradesh, Madhya Pradesh and Rajasthan

RESPONSES		UTTAR PRADESH (%)	MADHYA PRADESH (%)	RAJASTHAN (%)	TOTAL (%)
Got work under MGNREGA in last 12 months		86.50	60.42	94.48	80.73
No. of days of employment given in the past 12 months[12]	No days given	1.59	15.76	5.54	6.53
	1–25 days	49.04	36.95	19.38	34.68
	26–50 days	28.03	20.69	23.08	24.35
	51–75 days	11.78	8.37	9.54	10.10
	76–100 days	8.92	17.24	42.15	23.75
	100+ days	0.64	0.99	0.31	0.59
Need more than 100 days of employment under MGNREGA to support household needs		97.52	90.18	97.97	95.30
Additional days demanded (100+ days) under MGNREGA	125–150 days	39.27	54.46	45.10	45.88
	151–200 days	35.03	35.31	36.20	35.51
	201–300 days	17.80	9.90	13.95	14.08
	300+ days	7.91	0.33	4.75	4.53

The respondents suggested a number of measures to reduce distress migration:

- The present average daily wage rate of MGNREGA should be increased to ₹350–₹400.
- The guaranteed number of days of employment should be increased to at least 250, failing which unemployment allowance should be paid as provided for in the Act.
- There should be timely payment of wages. Though only 2% of households in our sample demanded this, there is a larger problem of delayed payments, which has led to a loss of faith in the scheme and has forced people to search for other alternatives.
- Educated adult migrants felt that the scheme did not offer any opportunities for skilled work. They were ashamed to work as unskilled labourers.
- At least two job cards per household should be provided so that more family members can work.

[12] Shows the number of days of employment given in the past 12 months: 6.53% hadn't got work under MGNREGA.

4

Strengthening climate resilience through migration: conclusions and way forward

4.1 Conclusions

When MGNREGA was launched by the Government of India it was seen as a panacea to rural distress and forced migration. However, results from this research show that MGNREGA has not been able to provide an adequate safety net to all families faced with socioeconomic crisis and climate risks. Some are still forced into distress migration. This is due to a number of reasons such as low wage rate, delayed payment, lack of assured work and administrative delays. Besides this, migrants also face issues due to the prevailing informality in the labour market. Their rights and entitlements to decent working and living conditions at destination sites are often not recognised. Some of the conclusions from the study that are important to recognise in the context of MGNREGA are as follows.

Migration is becoming increasingly important for climate resilience

Of the 1046 households in all three states, more than two thirds (70%) of the respondents indicated that drought/irregular rainfall is a significant stressor. In addition, 23% of the total households mentioned flood as a significant stressor, while 8.3% mentioned hailstorms. Migration is becoming established as a household adaptation strategy to cope with climate and economic stresses in the survey areas. The data shows that 37% of households had seen at least one member migrate in the past. The percentage of households that have already experienced migration is highest in Uttar Pradesh (50%), followed by Madhya Pradesh (34%) and Rajasthan (28%).

During climate distress, slow-onset events such as drought can threaten natural resource-based livelihoods such as agriculture, livestock and fishery, compromising people's ability to earn a living. This can push them to consider migration for better economic opportunities elsewhere. The effect is stronger when rapid-onset hazards such as hailstorms or floods damage crops, cultivable lands and property, leaving few or no options for the communities to adapt in situ. Under such situations, migration is the only viable option for survival. In both situations, people are forced to move because of a lack of local or other viable options.

Social protection programmes like MGNREGA can help mitigate the pressures leading to distress migration. This is especially important as distress

BOX 2. MIGRATION TRENDS

Circular/seasonal/short-term migration dominates.

Economic reasons drive migration (including employment) – lack of employment opportunity at the origin acts as a push factor and opportunities at destination act as pull factors.

Climate hazards/stresses contribute to migration. Rapid-onset hazards often become the immediate cause of migration, while slow-onset hazards affect the ability to earn a living, which, in turn, contributes to migration.

Remittances improve material wellbeing – they help families repay debt and buy agricultural inputs, and boost the wellbeing of families back home.

migrants may be at a disadvantage in the urban labour market and can be exploited. However, MGNREGA is not operating efficiently in this role. Almost 60% of households reported to have migrated after a natural calamity because of problems in accessing work under MGNREGA.

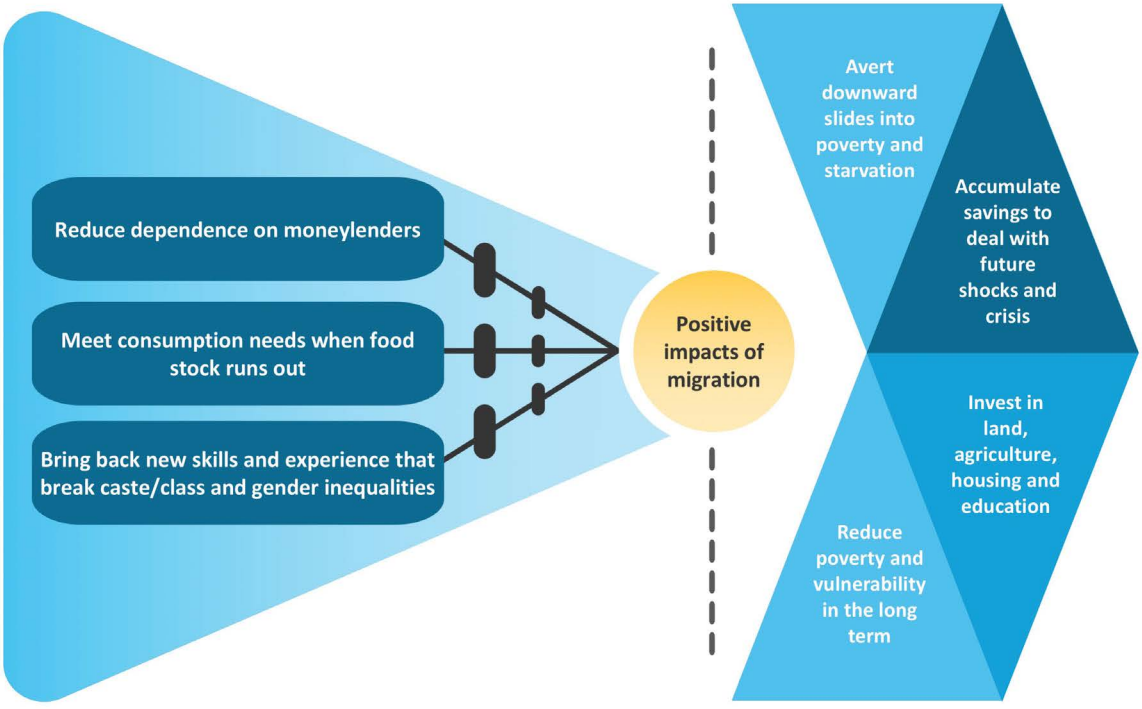
It is also important to recognise that seasonal migration is closely associated with debt cycles, such as needing to repay a money lender to cover losses in agriculture, or debt for other expenditures such as health, marriages, festivals, ceremonies and so on. Migrant remittances can be a dominant and a more certain revenue for household incomes than dryland farming across the country. Thus, migration remittances are probably preventing rural households from sliding further into poverty. Besides, migrants acquire new skills at destination sites. Over time, they may move into the skilled workforce and improve their earnings. On the social side, when they are exposed to urban culture where class, caste and gender divide are not prevalent, they bring back those values to the village and influence social practices.

Overall, migration is an important development and resilience strategy. It provides opportunities to reduce poverty, inequality, and contribute to climate risk management.

The need to recognise migration's negative consequences

Whilst migration can give rise to economic benefits, there are other social consequences, both for the migrants and the families that are left behind (mostly women, children and elderly people). There are many costs and risks associated with migration that are difficult for poor and vulnerable people to cope with. Migration leads to the breaking up of families and affects gender roles. As the men migrate, women who stay behind often end up overburdened, and those migrating are exposed to sexual exploitation, overwork and hard living conditions. Migrating single men are also susceptible to high-risk sexual behaviour exposing them to HIV/AIDS.

Figure 18. Positive impacts of migration



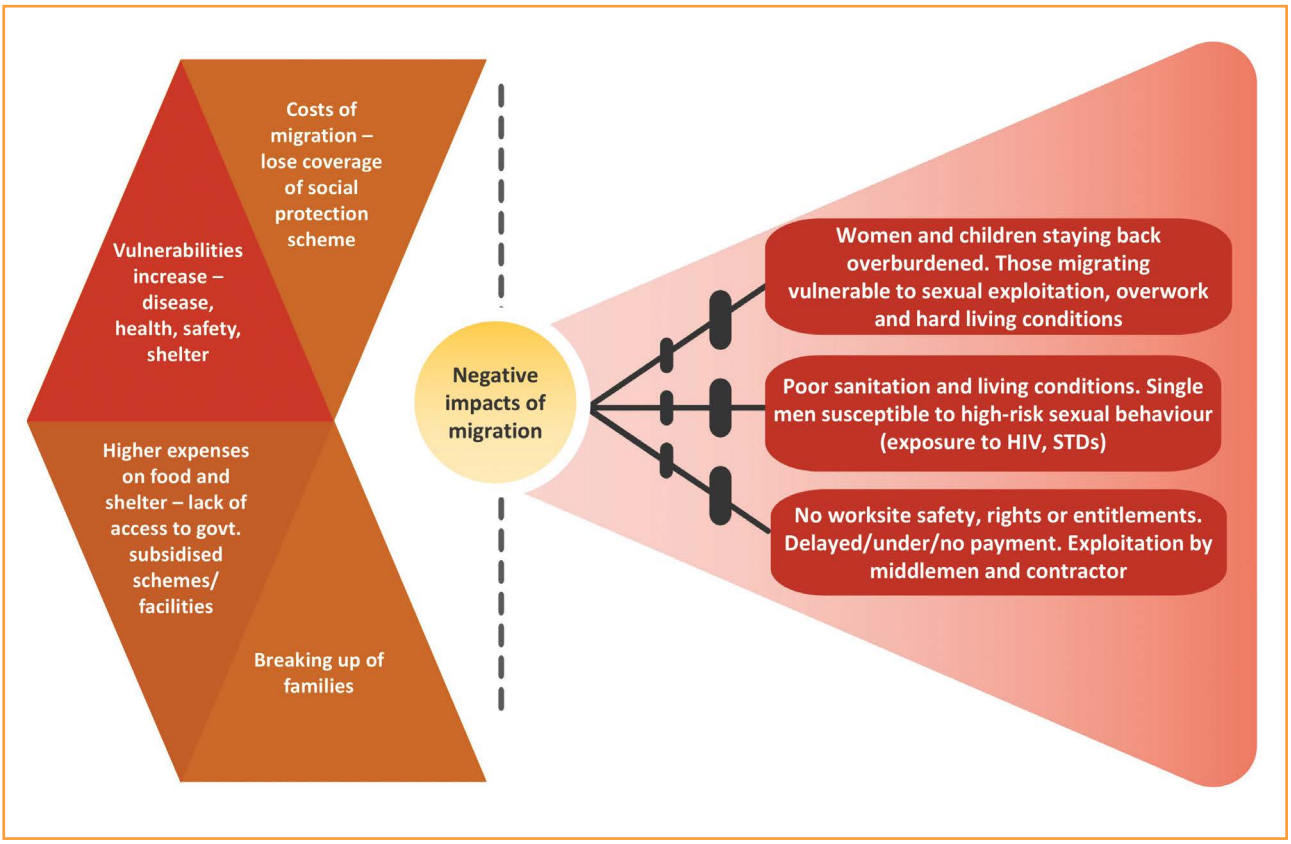
BOX 3. A REVERSE MIGRATION CRISIS DURING COVID-19

The virtual shutdown of all economic activities due to India's COVID-19 lockdown deprived migrant workers of their livelihoods. India saw a tide of migrant workers travelling back home on foot, often hundreds of kilometres. These daily wage workers had little to fall back on. Government estimates that about 500,000–600,000 people walked back to their hometown. A significant part of the workforce has reverse migrated from cities to rural areas, causing a crisis that the government is tackling by allocating an additional fund of ₹400 billion under MGNREGA. However, if these migrant workers had had enough social protection at the destination site to support their food, shelter and health needs, they may not have needed to travel back to villages under perilous conditions.

The receiving areas are often inadequately prepared to accommodate migrants, in terms of basic shelter and sanitation facilities. This leads to migrants often living in unsanitary conditions, exposing them to diseases. Most migrants do not have proper housing facilities, access to sanitation or the subsidised government Public Distribution System (PDS) for food grains. Those who migrate with family are not able to send their children to government schools at the destination and do not have access to subsidised healthcare. This results in higher expenditure on food, health and shelter.

Labour and workplace safety laws are widely disregarded. Migrants are often forced to overwork, are paid less and are exposed to polluting working conditions without safety equipment. For example, migrants working in brick kilns often come back with lung disease that is caused by inhaling dust and polluted air. Most of the migrants work on informal contracts and are often engaged through middlemen, which means they are exposed to exploitation and have no accidental or insurance cover. Moreover, they do not have any employment security.

Figure 19. Negative impacts of migration



4.2 Recommendations

In order to tap the true potential of MGNREGA, there is a need to address the scheme's underlying operational inefficiencies and challenges and also gear it towards helping migrants deal with the issues at destination sites. Some recommendations to help MGNREGA achieve this are as follows.

Breaking the rural–urban silos

Migration issues have come into sharp focus following the COVID-19 crisis, which triggered widespread reverse migration, causing the government to allocate additional budget to MGNREGA. This focus offers an opportunity to redesign the programme.

In its current design, MGNREGA does not recognise climate-induced rural–urban migration as a livelihood strategy. Nor does it address the implications for migrants or their families left behind.

During climate-induced distress migration, not everyone is able to move out. Women, children and people from marginalised communities may be left in straitened circumstances that exacerbate their vulnerability. A pragmatic mix of climate action and convergence with other social protection programmes is needed – where the response should consider the different vulnerabilities of both those who move out as well as the ones who stay, in both rural and urban areas.

In rural areas, this would involve supporting and protecting the livelihoods of people and strengthening social support systems, particularly for women, children and Scheduled Caste and Scheduled Tribe populations.

In order to ensure the protection and resilience of families, especially those where earning adult members have migrated, MGNREGA support needs to be bolstered in convergence with other social security measures, such as the Public Distribution System of food grain at subsidised prices, midday meal for children in government schools and the Integrated Child Development Services (ICDS) for early childcare, education and nutrition. If strengthened, these can provide important means for the rural poor to cope with climate and economic shocks.

At the urban end, it is not necessary to stop mobility. Migration has shown to be a successful adaptation strategy and can also help rural populations improve their wellbeing. Government policy response needs to extend rights and social safety nets to migrant workers at the destination sites. This can be done by ensuring safe and decent work, affordable housing, access to health services and improved water and sanitation facilities.

A fundamental flaw that MGNREGA needs to address is that the scheme only provides a safety net to communities as long as they are in their native village. MGNREGA provides a rights-based framework to all rural workers guaranteeing basic minimum wage employment with decent working conditions and worksite facilities in rural areas. But if the same workers have to undergo climate-induced distress migration or displacement, they are left without the cover of the social protection programme and often have to stay and work in sub-human conditions for survival, devoid of any rights, benefits or entitlements. Government policy response needs to extend rights and social safety nets to these migrant workers in the destination sites by redesigning and strengthening MGNREGA in convergence with other programmes, so that it:

(i) Becomes universal and does not operate within urban–rural silos. Work in urban areas can be provided in government infrastructure projects through public work departments (such as road works, building construction and so on) or in coordination with the private sector.

(ii) Offers portable MGNREGA entitlements guided by the principles of mobility. Wage employment, minimum wage rate, worksite facility and so on should be guaranteed. This can be ensured by making use of the national database for each individual using the Unique Identification Authority of India UIDAI/Aadhaar (with pan-Indian access). The government has already successfully used this model for the Public Distribution System providing subsidised food grain to households under the One Nation One Ration Card initiative. The time is now right to extend the same approach to other social protection schemes like MGNREGA.

(iii) Becomes comprehensive and covers entitlements and facilities that can help families cope and survive under climate-induced duress (or other crises like COVID-19) in both urban and rural areas. This would mean extending MGNREGA benefits to family members who have migrated as well as to those who have stayed back in villages.

(iv) Is inclusive and suitable for all vulnerable and marginalised communities.

Strengthening MGNREGA in migration source areas

MGNREGA needs to provide a steady source of income and livelihood security for the poor and the marginalised, so that it can act as an essential means for coping with climate shocks. Our research shows that families undertook distress migration where they perceived that there was no other option open to them in order to survive. This indicates that MGNREGA did not act as a viable safety net to these families. Administrative delays in sanctioning work, lack of transparency and delay in wage payment are some of the reasons why families do not consider MGNREGA as a fallback option during

Table 9. Suggestions for improving MGNREGA

	PERCENT OF HOUSEHOLDS REPORTING			
SUGGESTIONS	UTTAR PRADESH (%)	MADHYA PRADESH (%)	RAJASTHAN (%)	OVERALL (%)
Availability of work on a regular basis	25.00	22.41	15.07	20.60
Creation of more irrigation and drinking water facilities	0.00	6.90	28.77	12.56
Increase number of days of guaranteed wage employment	69.12	58.62	41.10	55.78
Timely payment of wages	1.47	1.72	2.74	2.01

crisis. Having only 100 days of work a year at most, at comparatively lower wages than urban wage rates, does not help. Migrants feel they will be able to sustain their families better if they migrate, even though it exposes them to hardship at destination sites.

Respondents in the research area across the three states came up with many suggestions on how MGNREGA can be strengthened (Table 9). While some of these pertain to improving the existing programme's delivery in terms of timely availability of works and payment of wages, other suggestions relate to revising the scheme, and need more careful consideration by government.

More than 50% of the households across the three states wanted the number of guaranteed wage employment days to be increased. Here it is important to note that in recent years (excluding the last financial year), only 2,400,000–5,200,000 households completed 100 days of employment under the scheme. This is merely 2.5–5.4% of the active job card holders. It suggests only a small proportion of families would avail themselves of more than 100 days of employment. Yet these are the most vulnerable, and do not have any other source of sustenance. If the government doubles their entitlement to 200 days, the additional budget needed, based on the average wage rate, will be in the range of ₹400 to ₹900 million, which will not be a huge burden on national finances. The percentage of households availing themselves of 100 days may rise if the issues around administrative delays, timely availability of work and so on are addressed. But even so, providing assured safety nets to families during crisis can be more economical and cost-effective for the government than managing distress migration and displacement.

In the past year, notwithstanding the issues with programme delivery, MGNREGA acted as an important safety net for returnee migrants during the COVID-19 crisis, when lockdowns forced migrants to return home. The number of households seeking employment under MGNREGA increased to 75.5 million compared to an average of 52.8 million in the past three financial years. But during the survey for this research, returnee migrants raised the issues of low wages, poor transparency, non-availability of work when demanded and lack of work for skilled workers under MGNREGA. It is also important to note that if MGNREGA work was available in urban areas, these migrants may not have needed to return home during the lockdowns.

MGNREGA needs to improve its operational efficiency in terms of targeting those in need and the timely delivery of works and wages. But it should also take a fresh look at who is entitled to help, in the light of lessons from the COVID-19 era. MGNREGA could be used as a more effective instrument to help communities cope and recover from climate and other shocks and stresses.

Making workers 'migration ready' and creating safe pathways

Making people ready for migration-related employment

Many migrants have little or no education and are broadly in the category of unskilled workers. But with rising standards in industry (Make in India; Zero Defect Zero Effect) and large construction/infrastructure projects, the demand for skilled jobs has gone up, creating a mismatch between the skills of labour supply and demand. India needs to map out-migration hotspots based on layered climate change, socioeconomic, political and institutional drivers so as to identify the migration pathways vulnerable communities take during times of crisis. This could be complemented by participatory community-level assessments that identify migration patterns (for example whether people migrate

alone or with family), migrants' education and skill level, and where they seek employment in destination sites. Mapping the skill requirement in destination sites and developing a systematic programme for enhancing such skills within vulnerable communities would help prepare migrants for successful employment. Training could be complemented with certification and placement services.

This research shows that most rural households could not access the skill development opportunity offered under the 'Unnati' component of MGNREGA because they could not meet the qualifying requirement of 100 days of employment in the previous financial year. This was mostly because work was not available, rather than due to lack of demand. Also, someone who is already migrating may not be in the home village long enough to complete 100 days. Similarly, the women household heads may not be able to take up 100 days because they are overburdened by household and other responsibilities. MGNREGA should relax the 100 days' requirement so all households can access training, especially women and youths. This relaxing of the requirement should encompass families that have migrated in the past as well as those who have not.

Lack of certification or documentation for skills is a major reason that many workers, even if they are skilled, are paid unskilled wages. So MGNREGA job cards should be updated to record skills and any training people have undertaken. The biometric Aadhaar/ UIDAI card, which mentions education level and other demographic details, could also record information on skills and training.

Facilitating employment at destination sites

Skill enhancement could be complemented with placement services. The MGNREGA website or an app for mobiles could list opportunities for workers with different skill types in industry or government construction or infrastructure projects. This would bypass exploitative middlemen and contractors, who place unnamed workers on employment registers, thereby avoiding responsibility for their welfare or safety. Direct placement would ensure that this informality in the labour market is removed and workers have access to basic work facilities mandated by law. Migrant workers should be provided with additional services such as rights awareness, helpline services and remittance services. Such support should be facilitated in convergence with other social protection programmes and in partnership with NGOs. This will help to diminish migrants' exposure to risks and enhance their capacity to protect themselves from exploitative work conditions.

How a revamped MGNREGA can enhance climate resilience

Figure 20 illustrates the theory of change for how a revamped MGNREGA **that allots greater centrality to migration can deliver greater climate resilience to rural communities.**

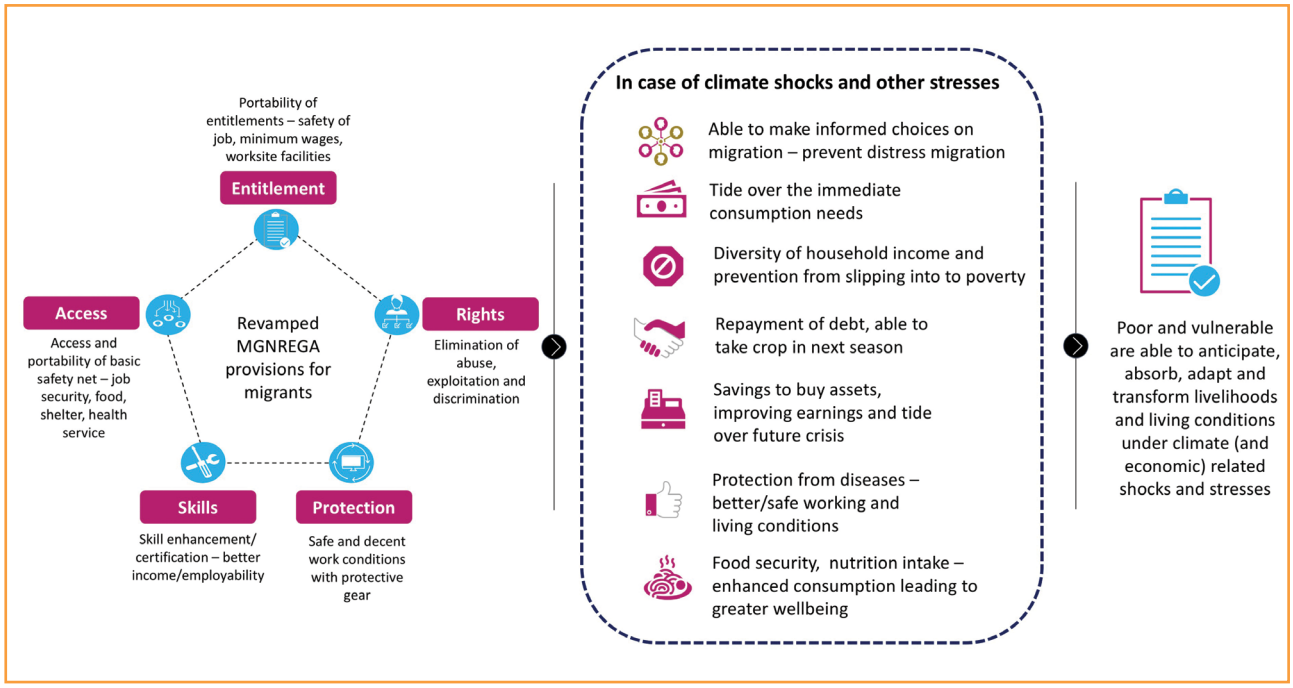
Entitlements: MGNREGA should provide portable entitlements, particularly those around guaranteed minimum days and wages, security of the allocated number of days of employment for a migrant worker, minimum wages based on rates in the industry absorbing them, and basic minimum worksite facilities.

BOX 4. REVAMPING MGNREGA

MGNREGA needs to broaden from being natural resource management-based to also emphasising human resource development. And it must recognise that people make their livelihoods in multiple locations. The scheme needs to provide communities with adequate means, resources and information to enable them to make informed choices. It should not seek to limit people to rural areas. Instead, it should recognise that migration results from people's own efforts to access employment. MGNREGA should explicitly recognise the centrality of migration in protecting and promoting rural livelihoods. MGNREGA should:

- Develop a clear, comprehensive framework to integrate migration into its operational guidelines.
- Enhance human capital through skill development, with a focus on landless people or those with limited access to land and other natural resource-based livelihoods.
- Expand its safety net to address the vulnerabilities of both migrants and those who stay behind. Importantly, the entitlement to 100 days' work should cover the migrating household member as well as those remaining in the village.
- Develop effective strategies for convergence with other schemes/programmes on housing, health and education, in order to provide comprehensive cover.

Figure 20. How a revamped MGNRGA could deliver greater climate resilience for migrants



Skills: Skill enhancement and certification can offer better income and employability to the migrant workers. Where certification is not possible, job cards should note the skill training undergone and its duration.

Access: Access to and portability of the basic safety net is important and must include subsidised food, shelter and health services, in convergence with other schemes.

Rights: MGNREGA must ensure that there are mechanisms that eliminate abuse, exploitation and discrimination against migrant workers, and that complaint and helpline services are available.

Protection: Mechanisms are needed to ensure safe and decent work conditions with necessary protective gear.

These changes will allow rural households to make informed choices on migration and also to undertake opportunistic or aspirational migration in search of better and more lucrative opportunities. The safety net of an assured job, entitlements, minimum wages and so on both at the rural and urban level will allow the households to:

(i) Meet their immediate consumption needs during a crisis

(ii) Diversify household income and avoid slipping further into poverty

(iii) Continue debt repayments and buy agricultural inputs for the next season

(iv) Save towards assets, improve earnings and build resilience against future crises, and

(v) Have better protection from diseases.

All these benefits can help poor rural households anticipate, absorb, adapt and transform livelihoods and living conditions under climate (and economic)-related shocks and stresses.

References

Abu, M, Codjoe, SNA and Sward, J (2014) Climate change and internal migration intentions in the forest-savannah transition zone of Ghana. *Population and Environment*, 35(4), 341–364.

Adger, WN, de Campos, RS, Codjoe, SNA, Siddiqui, T, Hazra, S, Das, S, and Abu, M (2021) Perceived environmental risks and insecurity reduce future migration intentions in hazardous migration source areas. *One Earth*, 4(1), 146–157.

Ahmed, S and Eklund, E (2021) Climate Change Impacts in Coastal Bangladesh: Migration, Gender And Environmental Injustice. *Asian Affairs*, 52(1), 155–174 https://doi.org/10.1080/03068374.2021.1880213

Anti-Slavery International Volunteers for Social Justice (2017) Slavery in India's brick kilns and the payment system. Way forward in the fight for fair wages, decent work and eradication of slavery. https://www.antislavery.org/wp-content/uploads/2017/09/Slavery-In-Indias-Brick-Kilns-The-Payment-System.pdf

Antman, FM (2013) The impact of migration on family left behind. In *International Handbook on the Economics of Migration*. Edward Elgar Publishing, Cheltenham and Northampton.

Ashok, S and Thomas, N (2014) A study on issues of inter-state migrant labourers in India. *International Journal of Scientific and Engineering Research* 5(7), 91–94. https://www.ijser.org/researchpaper/A-study-on-issues-of-inter-state-migrant-labourers-in-India.pdf

Bharadwaj, R, Bishop, D, Hazra, S, Pufaa, E and Annan, JK (2021) Climate-induced migration and modern slavery. https://pubs.iied.org/20441g

Black, R, Adger, WN, Arnell, NW, Dercon, S, Geddes, A and Thomas, D (2011) The effect of environmental change on human migration. *Global Environmental Change*, 21, S3–S11.

Cundill, G, Singh, C, Adger, WN, De Campos, RS, Vincent, K, Tebboth, M and Maharjan, A (2021). Toward a climate mobilities research agenda: Intersectionality, immobility, and policy responses. *Global Environmental Change*, 69, 102315.

CARIAA (2019) Understanding Migration in India. http://www.assar.uct.ac.za/sites/default/files/image_tool/images/138/South_Asia/India%20CEG%20Migration%20Synthesis%20Brief.pdf

Chandramouli, C and General, R (2011) Census of India 2011. Provisional Population Totals. New Delhi: Government of India, 409–413. https://censusindia.gov.in/2011-prov-results/prov_results_paper1_india.html

Desai, S and Vanneman, R (2015) India human development survey-ii (ihds-ii), 2011–12. Inter-university Consortium for Political and Social Research, Ann Arbor, MI. https://doi.org/10.3886/ICPSR36151.v6

Deshingkar, P and Akter, S (2009) Migration and Human Development in India. Human Development Research Paper 2009/13. UNDP, New York.

Deshingkar, P and Start, D (2003) Seasonal migration for livelihoods in India: Coping, accumulation and exclusion (Vol. 111). London: Overseas Development Institute. https://www.files.ethz.ch/isn/95707/wp220.pdf

Deshingkar, P (2006) Internal migration, poverty and development in Asia. ODI Briefing Paper, 11.

Drinkwater, S, Levine, P, Lotti, E and Pearlman, J (2003) The economic impact of migration: A survey. Hamburgisches Welt-Wirtschafts-Archiv

Economic Survey of India (2016–2017) https://www.indiabudget.gov.in/budget2017-2018/es2016-17/echapter.pdf

Eckstein, D, Künzel, V and Schäfer, L (2021) Global Climate Risk Index 2021. Who Suffers Most from Extreme Weather Events, 2000–2019. www.germanwatch.org/en/cri

Hagen-Zanker, J, Mosler Vidal, E and Sturge, G (2017) Social protection, migration and the 2030 Agenda for Sustainable Development.

Haque, NU and Kim, SJ (1995) "Human capital flight": Impact of migration on income and growth. *Staff Papers*, 42(3), 577–607.

Kothari, U (2002) Migration and chronic poverty (Vol. 16). Institute for Development Policy and Management: Chronic Poverty Research Centre, Manchester.

Koubi, V, Spilker, G, Schaffer, L and Bernauer, T (2016) Environmental stressors and migration: Evidence from Vietnam. *World Development*, 79, 197–210.

Krishnan, R, Sanjay, J, Gnanaseelan, C, Mujumdar, M, Kulkarni, A and Chakraborty, S (2020) Assessment of climate change over the Indian region: a report of the

ministry of earth sciences (MOES), Government of India (p. 226). Springer Nature.

Neupane, KW (2016) Climate migrants and urban adaptation in India and China. Prepared for University of Notre Dame Global Adaptation Index (ND-GAIN). http://www.shram.org/uploadFiles/20170808032447.pdf

NSSO (2009–10) Employment and Unemployment Situation in India. NSS 66th ROUND. Ministry of Statistics and Programme Implementation. Government of India. NSS Report No. 537(66/10/1), cited in http://mospi.nic.in/sites/default/files/publication_reports/nss_rep_563_13mar15.pdf

Ratha, D, Mohapatra, S and Scheja, E (2011) Impact of migration on economic and social development: a review of evidence and emerging issues. World Bank Policy Research Working Paper, (5558). https://openknowledge.worldbank.org/handle/10986/3328 License: CC BY 3.0 IGO.

Pocock, NS, Kiss, L, Dash, M, Mak, J and Zimmerman, C (2020) Challenges to pre-migration interventions to prevent human trafficking: Results from a before-and-after learning assessment of training for prospective female migrants in Odisha, India. *PLoS one*, 15(9), e0238778. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0238778

Rama Rao, CA, Raju, B M K., Subba Rao, AVM, 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 p.116. http://www.nicra-icar.in/nicrarevised/images/publications/Vulerability_Atlas_web.pdf

Sharma, A, Kulkarni, R and Khandelwal, R (2014) Studies, stories and a canvas: seasonal labor migration and migrant workers from Odisha. Center for Migration and Labor Solutions (CMLS), Supported by Sir Dorabji Tata Trust and Allied Trusts. https://www.humandignity.foundation/wp-content/uploads/2018/11/Odisha-State-Migration-Profile-Report.pdf

Singh, C (2019) Migration as a driver of changing household structures: Implications for local livelihoods and adaptation. *Migration and Development*, 8(3), 301–319. https://doi.org/10.1080/21632324.2019.1589073

Singh, C and Basu, R (2020) Moving in and out of vulnerability: interrogating migration as an adaptation strategy along a rural–urban continuum in India. *The Geographical Journal*, 186(1), 87–102. https://doi.org/10.1111/geoj.12328

Skeldon, R (2005) Globalization, Skilled Migration and Poverty Alleviation: Brain Drains in Context. Working Paper T15, Development Research Centre on Migration, Globalisation and Poverty. University of Sussex, Brighton.

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. http://pubs.iied.org/10206IIED

Tan, Y (2017) Resettlement and climate impact: Addressing migration intention of resettled people in west China. *Australian Geographer*, 48(1), pp.97–119.

United Nations Educational, Scientific and Cultural Organization (UNESCO) (2018) Global education monitoring report 2019. Migration, displacement and education: building bridges, not walls. https://en.unesco.org/gem-report/report/2019/migration

Annexes

Annex 1. Type of migration by the place of residence

UTTAR PRADESH								
		Last residence	Duration of residence 0–9 years (2001–11)					
			Total migrants			Work/employment		
	Type of migration	Total/ Rural/ Urban	Persons	Males	Females	Persons	Males	Females
1	Total	Total	14,412,965	2,958,526	11,454,439	1,224,065	1,008,880	215,185
2	Internal migration	Total	14,317,506	2,936,440	11,381,066	1,214,752	1,001,273	213,479
	Internal migration	Rural	10,324,117	1,626,905	8,697,212	749,665	611,884	137,781
	Internal migration	Urban	3,224,773	1,150,743	2,074,030	421,023	361,637	59,386
3	Inter-district migration	Total	4,916,827	1,051,174	3,865,653	524,311	444,447	79,864
	Inter-district migration	Rural	3,505,360	635,002	2,870,358	333,436	282,751	50,685
	Inter-district migration	Urban	1,172,794	368,620	804,174	173,354	149,715	23,639
4	Inter-state migration	Total	1,482,571	502,720	979,851	264,771	213,533	51,238
	Inter-state migration	Rural	740,625	215,143	525,482	138,770	107,740	31,030
	Inter-state migration	Urban	680,258	269,324	410,934	118,845	100,679	18,166
5	International migration – last residence outside India	Total	85,947	18,771	67,176	7,885	6,432	1,453

MADHYA PRADESH

	Type of migration	Last residence: Total/ Rural/ Urban	Duration of residence 0–9 years (2001–11): Total migrants: Persons	Total migrants: Males	Total migrants: Females	Work/employment: Persons	Work/employment: Males	Work/employment: Females
1	Total	Total	7,947,991	2,285,160	5,662,831	911,373	748,385	162,988
2	Internal migration	Total	7,926,386	2,277,066	5,649,320	907,930	745,419	162,511
	Internal migration	Rural	5,673,553	1,438,800	4,234,753	617,668	503,783	113,885
	Internal migration	Urban	1,918,136	748,848	1,169,288	263,365	224,749	38,616
3	Inter-district migration	Total	2,508,146	778,136	1,730,010	369,964	305,851	64,113
	Inter-district migration	Rural	1,586,988	446,791	1,140,197	229,806	187,638	42,168
	Inter-district migration	Urban	828,332	304,956	523,376	130,596	111,728	18,868
4	Inter-state migration	Total	942,512	327,375	615,137	167,796	145,779	22,017
	Inter-state migration	Rural	519,419	163,990	355,429	92,536	81,019	11,517
	Inter-state migration	Urban	386,409	151,941	234,468	70,782	61,550	9,232
5	International migration – last residence outside India	Total	19,659	7,412	12,247	3,067	2,664	403

RAJASTHAN

	Type of migration	Last residence: Total/ Rural/ Urban	Duration of residence 0–9 years (2001–11): Total Migrants: Persons	Total Migrants: Males	Total Migrants: Females	Work/employment: Persons	Work/employment: Males	Work/employment: Females
1	Total	Total	7,219,526	1,767,688	5,451,838	704,656	581,497	123,159
2	Internal migration	Total	7,161,933	1,745,619	5,416,314	695,828	573,752	122,076
	Internal migration	Rural	5,332,845	1,133,269	4,199,576	484,396	399,784	84,612
	Internal migration	Urban	1,435,115	526,494	908,621	182,911	158,175	24,736
3	Inter-district migration	Total	2,040,443	539,468	1,500,975	242,960	202,562	40,398
	Inter-district migration	Rural	1,397,121	332,003	1,065,118	160,163	133,102	27,061
	Inter-district migration	Urban	546,620	185,609	361,011	74,686	64,470	10,216
4	Inter-state migration	Total	1,025,903	364,518	661,385	181,916	156,234	25,682
	Inter-state migration	Rural	586,289	184,716	401,573	106,959	91,053	15,906
	Inter-state migration	Urban	398,442	165,578	232,864	69,552	61,321	8,231
5	International migration – last residence outside India	Total	40,101	15,658	24,443	6,289	5,536	753

Note: The place of last residence unclassifiable as 'Rural' or 'Urban' is included in 'Total'.
Data Source: D-3: Migrants by place of last residence, duration of residence and reasons for migration, (2011) Census of India

Annex 2. Methodology

Research priorities

RQ1: What are the patterns of migration?

Problem statement: There is a problem with the existing statistics on migration – official statistics do not include short-term migration and also tend to underestimate temporary migration. The definitions adopted by the census and the National Sample Survey (NSSO) do not provide reliable estimates of short-term migration. The 2001 census defines a migrant as a person residing in a place that is different from his or her place of birth or 'usual place of last residence', where the latter refers to place of residence for six months or more. This is likely to miss a significant number of short-term migrants who have as much of a chance of being counted in their place of birth or last residence as they do at their new destination. The 2007–08 NSSO counts short-term migrants as those who have not stayed in their 'usual place of last residence' for a period of between one and six months. The circular migration cycle, however, can be longer than six months. This short-term migration, often termed as circular migration, is the dominant trend for poorer groups, who have very little or no education and take on unskilled jobs at their destinations; however these trends are not fully understood or no reliable data is available beyond some case studies and project-based assessments.

Why we need it: In the absence of reliable data on the pattern of circular migration, the needs, issues and vulnerabilities of those who undertake it are not recognised exclusively by policymakers and therefore do not get addressed through social protection programmes like MGNREGA. It is also important to understand the vulnerability of those left behind and whether MGNREGA is supporting them tide over economic as well as climate crisis. Information on the trend of circular migration and the profile, vulnerabilities and needs of those who migrate and those left behind will help policymakers understand the complexity and diversity of migration – which will ensure that interventions are optimal, exclude as few people as possible and fine-tune interventions to suit different communities and areas (including both the destination and source site of migration).

How we will get this: These questions were answered using explorative/descriptive questions (household questionnaire, focused group discussion (FGD) and framed/analysed using the dependent variables in the migration intention and past migration models.

SUB-RESEARCH QUESTIONS	VARIABLES CURRENTLY IN THE SURVEY (QUESTIONNAIRE, FGD)	ANALYSIS PLAN
Qualifier question on migrants	1.1.7 a Has [name] migrated away from your village in the past? [identifies returned migrants]; If 'Yes'	These survey questions were analysed through looking for trends in qualitative responses and developing a narrative.
RQ1a: What are the patterns of planned short-term migration?	1.1.7 b How would you describe the type of migration of [name]? (Seasonal/permanent etc) Where did they migrate to? (If they have migrated multiple times enter the last place they migrated to) How would you describe this destination?	These survey questions were analysed through looking for trends in qualitative responses and developing a narrative.
RQ1b: What is the duration of these planned migrations?	4.1.2 If answered circular or seasonal migration, follow up: How often have they migrated in the last 12 months? How long were they away the last time they migrated? How long ago did they leave the household?	Analysed using descriptive statistics or combined with other variables into a modelling approach.
RQ1c: What type of households are planning to engage in these migrations?	Household roster. What is the employment status of [name]? What were the main reasons [name] migrated? What was your main livelihood activity after leaving this area? Other cross-cutting variables: education, gender, skills, source-wise income	These survey questions analysed through looking for trends in qualitative responses and developing a narrative.

RQ2: What are the underlying drivers of migration?

Problem statement: There are different push and pull factors for migration that are not fully understood in the Indian context, especially around MGNREGA.

- **Push factors:** Slow-onset hazards such as drought threaten Natural Resource Management based livelihoods such as agriculture, which is the primary livelihood for most of the rural population. When the ability to earn a living is compromised, these environmental hazards act as stressors that motivate people to consider migration for better economic opportunities elsewhere. Similarly, rapid-onset hazards like floods and so on usually lead to loss of crops, cultivable lands and property, leaving few or no options for the communities to adapt in situ. Under such situations, migration is the only viable option for survival. In both situations, people move because of a lack of local options due to climate shocks/stresses. Here, MGNREGA should act as a safety net or provide a fallback option to the vulnerable households, providing employment at local level, if they do not want to migrate.
- **Pull factors:** Migrants earn higher wages in urban destinations that allow them to accumulate cash and buy assets back home to secure longer-term livelihoods and exit from intergenerational poverty. Often this lure for higher/quick income serves as a pull factor even if the MGNREGA option is available at village level. Migration provides them with an opportunity to better the living standard of families back home, where they would barely have been able to survive on MGNREGA wages. Circular migration is also often linked to debt cycles and the need for money for repaying debts, covering deficits created by losses in agriculture, or meeting expenditures of large magnitude on account of marriages, festivals, ceremonies and so on (which can be considered as both push and pull factors).

Why we need it: Policymakers need to recognise that livelihoods pursued by rural poor are multi-source and multi-location and that people should be provided with an environment where they can make informed choices. MGNREGA needs to give explicit recognition to the centrality of migration in sustaining and enhancing rural livelihoods under the scheme – where MGNREGA should provide an enabling environment to facilitate migration for those who want to pursue it as a livelihood diversification strategy, but at the same time provide a decent safety net through MGNREGA to those who are not able to migrate.

What we need to know: We need to understand the underlying factors (climate and/or economic shock leading to loss of livelihood, debt, social needs such as marriage and festivals, money to sow crop in next agricultural season, buy assets, provide better housing, education for the family, children and so on) that drive distress migration by choice. Is MGNREGA able to address/ mitigate some of these underlying factors and why? Who chooses MGNREGA over migration and why? What are the factors driving these choices? Do migrant networks/ contractors/middlemen play a role in household choice?

We also need to understand the remittance profile – how much remittance to account for in the proportion of household incomes in marginal areas (dryland farming and rainfed areas). If not reducing poverty directly, remittances are probably helping to sustain rural livelihoods by preventing people from sliding further into poverty. What would be the prospect facing them had they depended solely on MGNREGA?

How we will get this: These questions will be answered using explorative/descriptive analysis (household questionnaire, FGD) and explanatory migration intention and past migration models. The methods used are listed in the table below.

SUB-RESEARCH QUESTIONS	VARIABLES CURRENTLY IN THE SURVEY (QUESTIONNAIRE, FGD)	ANALYSIS PLAN
Dependent variables: Do you or other household members intend to migrate in the future? Did you as an individual migrate in the past 24 months?		
RQ2a: Do economic shocks induce these planned migrations?	What was the main reason you stopped working there? What type of work did you hope to get before leaving this area?	These survey questions will be analysed through looking for trends in qualitative responses and developing a narrative.
	Household and individual income assessments	Survey questions analysed using the migration intention and past migration models. Various forms of income variables will be used to explain, and investigate the impact on, these outcomes.
RQ2b: Do environmental shocks induce these planned migrations?	What are the reasons you and/or other people are considering migrating?	Analysed looking at patterns in qualitative data and developing a narrative.
	Climate shocks on the household and the economic impacts of climate shocks	Survey questions analysed using the migration intention and past migration models. Various forms of income variable will be used to explain, and investigate the impact on these outcomes.
RQ2c: Do MGNREGA transfers induce migration? If so, what levels of wages induce migration?	4.9.4 How much money per person did you expect to earn (per month) without migration to other areas? Amount of MGNREGA the household or individual receives	This is a response from the individual. This can be analysed as a predictor of past migration.
	What kind changes are required in the programme to reduce migration? (FGD) Is this amount of MGNREGA work enough for you or would you prefer more MGNREGA work? (FGD)	Survey questions analysed using the migration intention and past migration models. MGNREGA income variables will be used to explain, and investigate the impact on, these outcomes. Thresholds can be explored.

RQ3: What are the issues and consequences of migration faced by communities?

Problem statement: Migration has many costs and risks associated with it that are difficult for poor and vulnerable people to cope with. Migration affects gender roles, with women in the sending areas often ending up overburdened as the males migrate. The migrant receiving areas are often inadequately prepared to accommodate them, in terms of infrastructure and facilities. This leads to migrants often living in unsanitary conditions and contracting diseases, since temporary residents in destination sites do not get access to social protection benefits like safe housing, health, subsidised food and so on.

Why we need this: Policymakers need to respond to these needs through a pragmatic mix of actions under existing social protection programmes like MGNREGA and others, where the response should consider the different vulnerabilities of both those who move as well as those who stay, in both rural and urban areas. In rural areas, this would involve supporting and protecting the livelihoods of people and strengthening social support systems, particularly for women, children and Scheduled Caste and Scheduled Tribe populations.

MGNREGA already provides wage support, but to ensure the protection and resilience of families, especially those where earning adult members have migrated, MGNREGA support needs to be bolstered in convergence with other social security measures, such as the PDS, midday meal and the ICDS, which cater to different population segments. While they suffer from problems of poor administration, delays and pilferage, if strengthened, they can provide important means for the rural poor to cope with climate/economic shocks. At the urban end, government policy response needs to extend rights and the social safety net of these migrant workers in the destination sites, by ensuring: safe and decent jobs, affordable housing, access to health services and improved water and sanitation facilities to help them deal with climate shocks, maintain/improve their consumption level and protect themselves from disease and health issues due to poor working and living conditions.

How we will get this:

SUB-RESEARCH QUESTIONS	VARIABLES CURRENTLY IN THE SURVEY (QUESTIONNAIRE, FGD)	ANALYSIS PLAN
RQ3a: Do they get access to MGNREGA? Do they access other SP schemes? Does it meet their basic needs?	Do you have job card? How many family members are working in the MGNREGA scheme? Are you aware of MGRNEGS planning? Are you involved in the planning? How many and what government departments and other schemes are working under MGNREGA in your village?	All of these questions were analysed using descriptive statistics
RQ3b: What issues and challenges they face at the destination site (job security, wage payment, exploitation by contractor/middlemen, access to sanitation/ health benefits)?	Do you have proper provision for safe and hygienic living conditions? Do you get employment during all the days of your stay at the destination site? If not, please mention the number of days. Are all the family members working during your stay? Are some of your family members interested in working in the MGNREGA programme in the migrant destinations? Would you be interested to work in the MGNREGA programme at the destination period during the breaks? Do you have proper provision for safe and hygienic living conditions at destination sites?	These questions were analysed using descriptive statistics
	Work site facility at destinations they migrate to. (FGD) Are you interested in working in the MGNREGA programme at destination locations in the breaks? (FGD)	These survey questions were analysed through looking for trends in qualitative responses and developing a narrative.

RQ4. Does MGNREGA act as an alternative to migration within the village?

Problem statement: Agriculture and its allied activities are the main source of livelihood in rural areas, but it only provides seasonal employment and is extremely vulnerable to climatic shocks and stresses, as much of it is rainfed. The rural communities therefore do not have other livelihood options on all days of the year, and when there are climate hazards like drought or floods their agriculture-based livelihoods also become compromised. The seasonal nature of this employment in rural areas has traditionally been forcing migration of rural people to urban areas.

To reduce this level of migration among rural people to urban areas because of lack of employment opportunities at the local level, the Government of India has a long legacy of running adaptive social protection programs that are aimed at helping rural communities obtain wage employment through public works programmes during agricultural lean periods or during droughts. Earlier schemes like Sampoorn Gramin Rozgar Yojana (SGRY) and the National Food for Work Program (NFWP) paid wages in cash and kind (food grain), both of which were welcomed by the rural poor as they provided much-needed food security to them. However these schemes faced severe supply bottlenecks and timely availability of the food grains, leakages and lack of a role in local planning of assets created through wage labour. Also, the employment generation component of these schemes at the rural level were only able to provide approximately 40–50 days of wage employment to the needy in a year beyond agriculture-based employment, forcing migration. Then came MGNREGA, which guaranteed 100 days' employment to every rural household in a year. Presuming that the normal agricultural operation provides 150–180 days' employment, if the monsoons do not fail, there is still a gap of more than 150 days of wage employment demand and schemes like MGNREGA were considered important in helping to fill this critical gap. Incidentally, the programme also has the provision of 50 days' additional wage employment in areas affected by climate hazards like floods, cyclones, droughts and so on. And therefore, many considered MGNREGA as an answer to distress migration.

Why we need it: We need to understand whether MGNREGA is able to provide the much-needed safety net or a fallback option to those families that are not able to migrate during a climate stress/shock. We want to understand this because research from the past shows that MGNREGA has been far from successful in alleviating distress migration due to a number of reasons such as low wage rate, delayed payment, leakages, lack of assured work, administrative delays in the declaration of drought that provides employment during critical times and so on. We need this to influence policymakers on the need to revamp the existing provisions under MGNREGA, such as wage rate, timing of payment, conditionality for sanction of the 50 additional days and so on – so that MGNREGA can act as a real safety net for the vulnerable families, particularly those who are not able to migrate. This will also be important for policymakers to understand from the perspective of the COVID-19 crisis – trying to explain to them whether MGNREGA acted as an alternative livelihood option during lockdown – for returnee migrants and those who were in the village. We also need to understand whether MGNREGA in the current form is adequate and what needs to change to make it responsive to climate vulnerable households that are not able to migrate, or family members of households who are left behind.

What we need to know: Do households get access to MGNREGA benefits as well as other social protection schemes when they need it (during climate and other shocks like COVID-19)? Do they meet their basic needs, and if not, in what way? ie availability of work, wage delay, type of work that they are not able to do, lack of information and so on.

What are the challenges faced by those left behind (women, elderly people)? Are they able to access MGNREGA benefits as well as other social protection schemes when they need them (during climate and other shocks like COVID-19)? Do they meet their basic needs, and if not, in what way? ie availability of work, wage delay, type of work that they are not able to do, lack of information and so on.

How we will get it:

SUB-RESEARCH QUESTIONS	VARIABLES (QUESTIONNAIRE, FGD)	ANALYSIS PLAN
RQ4a: In the absence of MGNREGA, and without the ability to migrate, what do households do when they experience climate stress/crop failure?	• What are the top three key things stopping you from migrating? • How much does [name] earn per month from this livelihood activity? • When MGNREGA provides safe working conditions and 100/150 days labour, why are you migrating to these places? • Are timely wage-earning opportunities created to reduce/withstand extreme conditions? When are they received? (FGD – MGRNEGS)	These survey questions will be analysed through looking for trends in qualitative responses and developing a narrative. Analysed through descriptive statistics
RQ4a: What are the challenges faced by those left behind (women, elderly people) when other members of the household migrate?	• Impacts of migration on the household and village. • What are the top three key things stopping you from migrating? (About trapped population)	These survey questions were analysed through looking for trends in qualitative responses and developing a narrative.

RQ5: How can MGNREGA be used to support or enable migration?

Problem statement: A fundamental design issue when we talk about migrants and MGNREGA is that the safety net that the scheme provides is only accessible to communities as long as they are in their native village. In the case of climate-induced distress migration or displacement (or due to other crisis such as COVID-19) they are left without the cover of such social protection programmes and often have to stay and work in sub-human conditions for survival, devoid of any rights, benefits or entitlements. The right to secure work, protection from loss of work, secure working, housing conditions and sanitation should be available to all vulnerable households, whether migrant or not.

Why we need it: There is a need to redesign and strengthen the schemes like MGNREGA, so that they (i) are universal and do not operate under urban–rural silos, (ii) are comprehensive and cover entitlements and facilities that can help families cope and survive under climate-induced duress, (iii) are inclusive and suitable for all vulnerable and marginalised communities, and (iv) offer portable entitlements guided by the principles of mobility.

How we will get this: This question is about individual migrants thinking back on their past migrations (within a reference period of three years) and thinking through what could have eased the process. This is a series of 'what' questions, backed up with a series of 'how' questions.

SUB-RESEARCH QUESTIONS	VARIABLES CURRENTLY IN THE SURVEY (QUESTIONNAIRE, FGD)	ANALYSIS PLAN
RQ5a: What support do migrants need – eg information, rights, skills, entitlements – to facilitate the migration process?	4.9.18 Would you be interested to work in the MGNREGA programme at the destination period during the breaks? 7.27 Have you developed any new skills through MGNREGA work? If Yes, please list new skills. Do you require any sort of training for improving productivity? 7.12 Do you know that you can demand additional man-days in case of droughts/floods/in climate-extreme conditions? Are you receiving them timely?	These survey questions were analysed through looking for trends in qualitative responses and developing a narrative.
RQ5b: Are these covered within the ambit of MGNREGA?	What kind of changes are required in the programme to reduce migration? (FGD) Will the change in the movement of migrant workers take the SMEs/ industries closer to villages? (FGD)	These questions were analysed using descriptive statistics

In this study, both quantitative and qualitative data were collected in Uttar Pradesh, Madhya Pradesh and Rajasthan. A mixed-method approach was used to collect primary data, which involved combining quantitative methods (a household survey) and qualitative methods (focus group discussions (FGDs) and key informant interviews (KIIs)) with stakeholders. Secondary data was gathered through a literature review.

Based on the review of district-level climate risks and vulnerabilities from the Atlas of Agricultural Vulnerability to Climate Change (Rama Rao et al., 2013) and State Disaster Management Plans (SDMPs), six districts were selected for the primary survey. The sample size of 180 households per district was calculated using the following equation:

$$n = \frac{D\,Z^2\,P \times Q}{E^2}$$

Where, *P = Proportion to be estimated, ie at 50% (0.5),*
Q = 1 – P (0.5),
E = desired margin of error of ± 5% (0.05),
Z = score corresponding to 95% significance level (1.96),
D = power of the study design (assumed as 2).

Two blocks per district in six districts across the three states of Uttar Pradesh, Madhya Pradesh and Rajasthan were selected in consultation with key stakeholders, based on the history of climate-related disasters in the region. A total of 1080 households were surveyed in the 12 selected blocks. Households were selected according to MGNREGA, migration and socioeconomic variations (eg caste, income) across the villages in the selected blocks.

Table A2.1 Sample size in the selected districts

STATE	DISTRICT	RURAL HOUSE-HOLDS	TOTAL		SAMPLE		
			BLOCKS	GRAM PANCHAYATS	BLOCKS	GRAM PANCHAYATS	HOUSE-HOLDS
Uttar Pradesh	Banda	1,799,410	8	471	2	8	180
	Mahoba	690,577	4	247	2	8	180
Madhya Pradesh	Barwani	1,181,812	7	417	2	8	180
	Alirajpur	671,925	6	288	2	8	180
Rajasthan	Jodhpur	2,422,551	13	165	2	8	180
	Barmer	2,421,914	14	84	2	8	180
Total		9,188,189	52	1672	12	48	1080

A detailed questionnaire was prepared covering all aspects related to climate change risk and vulnerability assessment. The questionnaire was translated into local languages to ensure that the respondents could understand the questions and provide accurate and appropriate responses. The questionnaire was implemented for the survey using a computer-assisted data collection tool. This tool helped execute the survey using mobiles and tablets and made it possible to capture high-quality data/information with GPS location of households that form individual survey units. The survey questionnaire was tested through pilot surveys for assessing key factors pertinent to the survey such as the adequacy of the questionnaire, suitability of the survey frame, operational procedures and so on.

A total of 48 focus group discussions (eight FGDs per district) were conducted to gain a complete picture of MGNREGA and migration patterns in the selected states. A purposive sampling approach was used to select the villages and participants. A total of 375 participants attended the FGDs. These FGD participants included Panchayati Raj Institution (rural local self-government) members (65) and 310 other participants, including MGNREGA wage earners, migrant families/migrants, and other local people such as self-help group members. The information gathered was helpful in the triangulation of the findings from the primary survey.

After the data collection, a detailed analysis was carried out to understand the factors determining household livelihood vulnerabilities. As a result, several tables such as 'Socioeconomic characteristics of households', 'Patterns and drivers of migration', and 'The role of MGNREGA in migration' were generated using SPSS.

A total of 1046 households participated during the primary survey. The participation rate was 97%. A brief profile of the households surveyed is presented in Table A2.2.

Most of the respondents were in the age group of 31–60 years. The percentage of respondents below the age of 40 years was also high in Rajasthan and Uttar Pradesh. Almost 50% of the respondents were married, and 3% of the respondents were widowed. Fifty-seven percent of all respondents were from the Scheduled Castes in Uttar Pradesh. The percentage of Scheduled Tribe respondents was negligible in all the states except Madhya Pradesh, where they constituted 90%.

Table A2.2 Socioeconomic characteristics of respondents (N = 1046)

VARIABLES		UTTAR PRADESH (%)	MADHYA PRADESH (%)	RAJASTHAN (%)	TOTAL (%)
Household size	1–3	17.0	19.9	18.0	18.3
	4–6	67.9	61.4	64.6	64.7
	≥ 7	15.1	18.7	17.4	17.0
	Mean household size	4.9	5.1	5.0	5.0
Age (Years)	≤ 40	76.8	77.4	78.0	77.4
	41–60	20.1	18.6	17.1	18.6
	> 60	3.1	4.0	4.9	4.0
	Mean age	27.2	27.0	26.7	26.9
Marital status	Never married	50.1	45.8	50.6	48.9
	Currently married	47.2	51.6	46.4	48.3
	Widowed	2.6	2.5	2.9	2.7
	Divorced/abandoned/separated	0.1	0.1	0.1	0.1
Caste[13]	General	2.2	0.1	7.2	3.3
	Scheduled Caste (SC)	57.1	7.7	15.4	27.4
	Scheduled Tribe (ST)	1.1	89.9	21.4	36.4
	Other Backward Class (OBC)	39.6	2.1	55.9	32.9
Formal education	No education	30.5	37.3	37.0	34.9
	Primary education	31.1	28.3	38.9	32.8
	Secondary education	15.8	18.9	17.0	17.2
	Higher education	6.8	5.0	3.0	5.0
Main livelihood	Farmer and fishermen	20.3	53.7	37.8	37.1
	Regular salaried employee	0.5	1.6	1.2	1.1
	Small business owner	0.9	0.5	0.9	0.8
	Construction and factory workers	15.1	6.4	9.1	10.3
	Unpaid home caregiver	12.4	12.6	10.3	11.8
	Others (daily labour)	50.7	25.2	40.7	38.9
Monthly income (₹)	≤ 3000	44.2	27.6	30.7	34.4
	3001–6000	26.9	21.4	30.1	26.2
	> 6000	28.8	51.0	39.1	39.4
	Mean monthly income	5067.9	7902.7	5969.1	6278.5

[13] The Constitution of India empowers the President of India to declare communities or part or a group of communities in a state as Scheduled Castes or Scheduled Tribes, in consultation with the governor of the state. The Constitution also empowers the Indian Parliament to include or exclude communities, or a part or a group of them, to the list of Scheduled Castes or Scheduled Tribes. The criteria for inclusion of communities in the list of Scheduled Castes are 'extreme social, educational and economic backwardness arising out of the traditional practice of untouchability'. The criteria followed for specification of a community as a Scheduled Tribe are (a) indications of primitive traits, (b) distinctive culture (c) geographical isolation, (d) shyness of contact with the community at large, and (e) backwardness. These criteria are not spelt out in the Constitution but have become well established and accepted through the work of several committees and commissions constituted by the Government of India. Other Backward Classes were identified by a government-appointed commission under Article 340 of the Constitution, to identify backward communities in India and recommend policy initiatives for their uplift and welfare. Other Backward Classes have been historically marginalised in India, and continue to face oppression and social, economic and educational isolation, but do not fall into the Scheduled Castes or Scheduled Tribes list.

Annex 3. Binary logistic regression analysis

A binary logistic regression was used to investigate what type of climate-related events may trigger migration intent. A binary logistic regression (often referred to simply as logistic regression or logit model) predicts the probability that an observation falls into one of two categories of a dichotomous dependent variable based on the behaviour of one or more independent variables that can be either continuous or categorical. Based on the existing literature and available primary data sets, one dependent variable and 12 independent variables were selected. This study has two types of independent variables, climate-related parameters and the household's socioeconomic characteristics. It is understood that the relationship between climate-related events and migration intention is complex. It is very difficult to distinguish individuals for whom climatic factors are the sole motivation for migration. Economic and sociopolitical factors also drive migration, but they may in turn be manifestations of climate effects. That is why it is essential to consider socioeconomic factors when investigating whether people will migrate due to climate-related events.

In the present study, the climate-related parameters were derived during the primary survey based on the households' perception on how their livelihoods have been affected by the changing climate in the last five to ten years. Household heads were chosen because of the role they play in migration decision making. They typically have the final say in major household decisions. Therefore, a combination of household head characteristics and general household information was used to measure the social vulnerability of households. These included the household head's age, sex, educational level, as well as the present migration status of the household, household size and household income. These factors amplify or reduce overall vulnerability to climate change. Details of the selected variables for binary logistic regression are shown in Table A3.1.

Dependent variables

This study uses migration intention as a proxy to measure the likelihood of future out-migration from the study areas. Therefore, migration intention is the dependent variable in this analysis. Household heads were asked, 'Do you or other household members intend to migrate in the future?' The question sought to identify household heads who intended to migrate from the community. Households that indicated 'yes' were those who have the intention to migrate, while those who said otherwise were classified as those who have no intention to migrate.

Independent variables

The independent variable used in the model was the climate-related events that household heads indicated affected them most in the last five to ten years. Drought, flood, heatwave, and hailstorm are the significant climate-related events in the selected states. The severity of each event as scored by the household was used in the regression model as the main independent variable.

Household size, household income, age, sex, and level of education of household head are known to influence migration intention. Age, household size, and monthly household income are continuous variables. Education was categorised as those with no education and those with primary education. There were very few respondents with secondary or higher education. With regard to sex, we distinguished between households that had females as their heads and those that had males as their heads. Finally, we classified current migration status of households into those who are currently migrants in the community and those who are not.

The distribution of the dependent variable for each state and other descriptive statistics of independent variables included in the model are summarised in Table A3.2.

Table A3.1 Description of dependent and independent variables in the study

VARIABLES	QUESTIONS	DEFINITIONS
DEPENDENT VARIABLES		
Migration intention	Do you or other household members intend to migrate in the future?	= 1 if yes, = 0 otherwise
INDEPENDENT VARIABLES		
Socioeconomic variables		
Household size	Total family members in the household	Continuous
Sex of household head	Gender of the head of the household	= 1 if male, = 0 otherwise
Age of household head	Age of the head of the household	Continuous
Education of head of the household	Education level of head of the household	= 1 no education, = 2 primary education, = 3 secondary education, = 4 higher education
Main livelihood of head of household	Main occupation of head of the household	= 1 crop farmer, = 2 MGNREGA, = 3 others
Household income	Monthly income of the household[14]	Continuous
Outstanding loan	Whether any of the household members in have taken any loan from a bank, friends or money lenders	= 1 if yes, = 0 otherwise
Migration network	Whether any household member has migrated from the village in the last two years	= 1 if yes, = 0 otherwise
Climate-related events		
Drought	The main climate and weather-related hazards that are experienced as part of livelihood	= 1 if happened (last 10 years), = 0 otherwise
Flood		
Hailstorm		
Heatwave		

[14] During fieldwork, the interviewer asked several questions related to income from various sources of all the household members over a typical year and thus arrived at the average monthly income of the household.

Table A3.2 Percentage distribution of dependent variable and independent variables

	UTTAR PRADESH		MADHYA PRADESH		RAJASTHAN		TOTAL	
VARIABLES	N	(%)	N	(%)	N	(%)	N	(%)
DEPENDENT VARIABLES								
Migration intention	149	40.90	104	30.86	72	20.87	325	31.07
INDEPENDENT VARIABLES								
Household size (mean)	4.91		5.05		5.02		4.99	
Sex of household head	284	78.00	294	87.24	263	76.20	841	80.40
Age of household head (mean)	44.7		44.89		44.18		44.59	
Education of household head								
No education	261	71.70	212	62.90	184	53.30	657	62.80
Primary education	27	7.40	29	8.60	43	12.50	99	9.50
Secondary education	38	10.40	51	15.10	75	21.70	164	15.70
Higher education	38	10.40	45	13.40	43	12.50	126	12.00
Main livelihood of household head								
Crop farmer	165	45.30	282	83.70	200	58.00	647	61.90
MGNREGA	130	35.70	1	0.30	77	22.30	208	19.90
Others	69	19.00	54	16.00	68	19.70	191	18.30
Household monthly income (₹)(mean)	5067.97		7902.78		5969.13		6278.52	
Outstanding loan	79	21.70	58	17.20	65	18.80	202	19.30
Migration network	182	50.00	113	33.50	95	27.50	390	37.30
Drought	284	78.00	166	49.30	345	100.00	795	76.00
Flood	52	14.30	189	56.10	0	0.00	241	23.00
Hailstorm	78	21.40	9	2.70	0	0.00	87	8.30
Heatwave	1	0.30	1	0.30	1	0.30	3	0.30

Three models were run for the study. The first model (**Model 1)** examines the relationship between socioeconomic vulnerabilities and migration intention. The second model **(Model 2)** examines the relationship between climate-related events or biophysical vulnerabilities and migration intention. The third model **(Model 3)** includes both socioeconomic and climatic variables. The regression results are presented in Table A3.3.

Table A3.3 Results of the binary logistic regression model

VARIABLES	ODDS RATIO					
	MODEL 1		MODEL 2		MODEL 3	
SOCIOECONOMIC VARIABLES						
Household size	1.139****	(0.038)			1.153****	(0.039)
Sex of household head	1.066	(0.192)			1.117	(0.197)
Age of household head	0.982***	(0.006)			0.981***	(0.006)
No education (RC)						
Primary education	1.21	(0.236)			1.268	(0.239)
Secondary education	0.636**	(0.210)			0.654**	(0.212)
Higher education	0.544**	(0.241)			0.542**	(0.244)
Crop farmer (RC)						
MGNREGA	0.644**	(0.208)			0.605**	(0.216)
Others	1.360*	(0.178)			1.356*	(0.180)
Household monthly income	1.000****	(0.000)			1.000****	(0.000)
Outstanding loan	1.273	(0.175)			1.225	(0.177)
Migration network	1.280*	(0.182)			1.514*	(0.166)
Climate-related events						
Drought			1.302*	(0.236)	1.157*	(0.257)
Flood			1.748**	(0.236)	1.419*	(0.256)
Hailstorm			2.528****	(0.242)	2.967****	(0.259)
Heatwave			1.410	(1.231)	1.404	(1.236)
Constant	0.357***	(0.369)	0.297****	(0.242)	0.260***	(0.471)
Chi-square (Sig.)	83.947	(0.000)	18.823	(0.000)	103.599	(0.000)
-2 Log likelihood	1212.394		1277.517		1192.741	
Cox and Snell R Square	0.077		0.018		0.094	
Nagelkerke R Square	0.109		0.025		0.133	

**** $p < 0.001$, *** $p < 0.01$, **$p < 0.05$, * $p < 0.1$
Standard error (S.E.) in parentheses
An odds ratio (OR) is a measure of association between an exposure and an outcome. OR=1 exposure does not affect odds of outcome, OR>1 exposure associated with higher odds of outcome, OR<1 exposure associated with lower odds of outcome.
RC = Reference category. RC is identified as a category of comparison for the other categories. This tells which category is the reference (or baseline) category for each variable.

The results show that all the models are fit for analysis. As per **Model 1**, household size, age of household head, education level and monthly household income are the most significant variables that can trigger migration responses at the household level. **Model 2** shows that climatic events like drought, flood and hailstorms act as 'stressors' and drive individuals/households to consider migration as a survival strategy. The results in Model 2 indicate that the climate-related stressors only explain about 3% of the variations in the intention to migrate. In **Model 3**, however, when the sociodemographic factors are controlled, the model explains about 13% of the variations in the intention to migrate. This is an indication of the strong role sociodemographic factors play in intentions to migrate.

Binary logistic regression was also employed at the state level. The state-level regression results are presented in Table A3.4.

Table A3.4. Results of the binary logistic regression model for each state

VARIABLES	ODDS RATIO					
	UTTAR PRADESH		MADHYA PRADESH		RAJASTHAN	
Socioeconomic Variables						
Household size	1.162**	(0.073)	1.033**	(0.064)	1.512****	(0.094)
Sex of household head	1.182	(0.319)	1.704	(0.421)	1.509	(0.504)
Age of household head	0.980*	(0.012)	0.977**	(0.012)	0.975*	(0.014)
No education (RC)						
Primary education	0.747	(0.507)	1.960	(0.423)	2.043	(0.452)
Secondary education	1.257	(0.422)	0.350**	(0.413)	0.895	(0.895)
Higher education	0.576*	(0.468)	0.540	(0.423)	0.895	(0.506)
Crop farmer (RC)						
MGNREGA	0.287****	(0.299)	0.499*	(0.302)	2.499**	(0.476)
Others	0.803	(0.332)	1.489	(0.339)	1.577	(0.384)
Household monthly income	1.000****	(0.000)	1.000**	(0.000)	1.000****	(0.000)
Outstanding loan	1.260	(0.292)	1.015	(0.332)	1.089	(0.423)
Migration network	1.539*	(0.159)	0.867	(0.272)	1.212*	(0.432)
Climate-related events						
Drought	1.941*	(0.384)	0.599*	(0.464)	1.112**	(0.237)
Flood	1.001**	(0.397)	1.279	(0.480)	0.679	(0.397)
Hailstorm	2.115**	(0.327)	0.709	(0.891)	0.811	(0.700)
Heatwave	1.101	(0.421)	0.921	(0.279)	1.721	(0.345)
Constant	0.265*	(0.787)	0.753*	(0.913)	0.810*	(0.876)
Chi-square (Sig.)	90.769	(0.000)	29.381	(0.001)	83.431	(0.000)
-2 Log likelihood	401.809		387.138		270.003	
Cox and Snell R Square	0.221		0.103		0.215	
Nagelkerke R Square	0.298		0.118		0.335	

**** $p < 0.001$, *** $p < 0.01$, **$p < 0.05$, * $p < 0.1$
Standard Error (S.E.) in parentheses
An odds ratio (OR) is a measure of association between an exposure and an outcome. OR=1 exposure does not affect odds of outcome, OR>1 exposure associated with higher odds of outcome, OR<1 exposure associated with lower odds of outcome.
RC = Reference Category. RC is identified as a category of comparison for the other categories. This tells which category is the reference (or baseline) category for each variable.

Annex 4. Migration attitudes and impacts in Uttar Pradesh, Madhya Pradesh and Rajasthan

CHARACTERISTICS	UTTAR PRADESH (%)	MADHYA PRADESH (%)	RAJASTHAN (%)	TOTAL (%)
Migration attitudes (migration is helpful or unhelpful)				
Helpful	67.9	67.4	62.3	65.9
Unhelpful	11.8	9.8	10.4	10.7
Neither helpful nor unhelpful	20.3	22.6	27.2	23.3
Not sure	0.0	0.3	0.0	0.1
Impacts of migration on migrants				
Social status (+)	90.4	83.1	88.1	87.3
Education and work opportunities (+)	85.4	79.8	83.8	83.1
Economic security (+)	67.6	72.4	71	70.3
Get sick or be in danger (–)	56.9	57.0	61.4	58.4
Respected in their destination (+)	57.4	62.9	65.2	61.8
Don't feel like they belong there (–)	56	56.1	61.4	57.8
Better opportunities for children (+)	78	75.4	77	76.9
Impacts of migration on household and village				
Social status (+)	100	75	93	89.3
Financially secure (+)	100	100	100	100
Difficult to maintain livelihood and responsibility (–)	10	20	12	14
Brings new ideas and practices (+)	80	70	70	73.3
Less young people in the village (–)	12	30	30	24
Migration intentions and barriers				
Intend to migrate in the future	40.9	30.9	20.9	31.1
Main reason – seeking employment	94.4	95.2	90.6	93.8

There are several aspects of climate-induced short-term or circular migration, especially in combination with other socioeconomic factors, that are not fully understood. Without reliable data on the pattern of circular migration, policymakers can not recognise or address migrants' needs, issues and vulnerabilities. This paper provides an understanding of what drives migration, the patterns associated with it, and its issues and consequences. It also gives broader policy recommendations on how to use social protection programmes to provide a safety net for migrants, both at source for family members staying back and at destination.

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