Economic Effects of COVID-19: Rapid Surveys of Rural Households in India

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ABSTRACT

The unprecedented nature of the COVID-19 pandemic entailed an urgent and proactive response from Indian policymakers. To support the formulation and implementation of effective and evidence-informed relief programmes, the World Bank in collaboration with IDinsight and the Development Data Lab sought to produce rigorous and responsive data for policymakers through rapid-response phone surveys across six states in India: Jharkhand, Rajasthan, Uttar Pradesh, Andhra Pradesh, Bihar and Madhya Pradesh. This report presents the findings of the three-round survey on agriculture, income and consumption, labour and migration, access to relief programmes, and healthcare.

The main findings of the survey suggest that rural households have been primarily impacted by job losses and heightened food insecurity. A gradual improvement in local employment opportunities along with access to welfare and food security services is evident towards the end of the lockdown. However, the repercussions of return migration of workers on jobs and income will continue to be significant in the short- and medium term.

The agriculture sector appeared to be more resilient with cultivating households expanding their activities to some extent. Another important finding is the high levels access and convergence of government relief and transfer programmes available to rural households, which has been effective in addressing the immediate needs of vulnerable households during the pandemic. This bodes well for institution-building initiatives that have over a period of time created processes and mechanisms to transfer resources more effectively to rural households, women and farmers.

ACKNOWLEDGEMENTS

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OVERVIEW

Around the globe, COVID-19 has severely impacted public health systems and economies, disrupting trade, industry and financial markets. In India too, the pandemic has had far-reaching economic consequences across sectors, resulting in the widespread loss of lives, livelihoods and incomes. This report summarises findings from three-rounds of rapid phone-based sample surveys aimed at understanding the economic effects of COVID-19 in rural India at the height of the pandemic in 2020.

The three rounds of survey conducted in May 2020 (during lockdown), July 2020 (post-lockdown) and September 2020 (latest round) were designed to assess the evolving impacts of the crisis and covered approximately 5,000 households in a partial panel design. The survey was administered across six Indian states - Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh and Andhra Pradesh and covered modules on agriculture, migration, consumption, labour and income, access to relief, as well as awareness of COVID-19-related symptoms and preventative practices, and health-seeking behaviour of the respondents.

The main findings of the survey suggest that rural households have been primarily impacted by job losses and heightened food insecurity. A gradual improvement in local employment opportunities along with access to welfare and food security services is evident towards the end of the lockdown. However, the repercussions of return migration of workers on jobs and income will continue to be significant in the short- and medium term.

Amid the overall dismal findings, the agriculture sector was not impacted as much as was expected at the start of the lockdown. Rather, agriculture households have been able to expand their activities to some extent. Another important finding is that convergence of relief programmes available to rural households along with additional government transfers has been effective in addressing the immediate needs of vulnerable households during the pandemic. This bodes well for institution-building initiatives that have over a period of time created processes and mechanisms to transfer resources more effectively to rural households, women and farmers.

KEY RESULTS

The sector-related highlights of the findings are summarised below.

Agriculture

The survey results show, on an average, a 3% increase in area under cultivation in the Kharif season of 2020 over that of Kharif 2019. Approximately 9% of farmers reported changing their crop from Kharif 2019. Of these, 21% of farmers shifted to cultivating cereals while 9% shifted to producing pulses and oilseeds. The remaining 70% changed crops within the same crop category. A shift to safer crops is likely to have driven these changes, given the severe impact on the perishables sector during the early part of the lockdown. Further, 58% of

eligible farmers reported receiving transfers under the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) since January 2020.

However, despite the increase in acreage, farmers on average reduced their fertiliser expenditure by 13% compared with the outgo in Kharif 2019. Overall, 57% of households reported a decrease in their fertiliser expenditure, with 20% reporting increases and 22% reporting no change. Across states, Andhra Pradesh (-37%) reported the largest average fall in fertiliser expenditure, while the decline was at its lowest in Uttar Pradesh (-7%).

Income and Consumption

The impact of the lockdown on the labour market was very pronounced in the form of the steep 16 percentage point rise in reported levels of unemployment between March 2020 and May 2020. There are signs of early recovery since the lockdown was lifted in July 2020, but indicators such as levels of employment, days worked, and daily wages in September 2020 were still roughly two-thirds of pre-lockdown levels reported in March 2020.

Consumption levels saw a downward trend during the lockdown - almost half of all surveyed households reported a fall in their weekly consumption expenditure during the lockdown from the pre-lockdown levels. Signs of food insecurity continued to persist in nearly one-third of the households almost three months after the lockdown was lifted.

Migration

The magnitude of job losses for migrant workers was almost triple of the overall job loss rates. This is a critical finding given that roughly 23% of the sample reported that a member of their household was a migrant. The sentiments of returned migrants to relocate back to their work village/town showed improvement from July 2020. Around 46% of them expressing a willingness to go back in September 2020 compared with 20% in July 2020.

Access to Relief

Almost half of all households covered in the survey reported receiving monetary relief from the Government in June 2020 as a direct cash transfer. However, there was a gradual decline in the average amount received (-13%) and coverage of monetary relief (-16%) between April 2020 and June 2020, consistent with the planned duration of these programs.

The amount of cash received appeared to be regressive - richer households received larger amounts in monetary assistance from the government. This is in direct contrast to the progressive targeting and the near-universal coverage of the Public Distribution System (PDS). A Rs. 1000 increase in weekly income was associated with a Rs.120 increase in the amount of cash relief received, whereas a Rs.1000 increase in weekly income was associated with a 0.8 kg decline in the amount of free wheat received from the PDS.

The PDS seemed to function well both in terms of beneficiary coverage and average quantity of relief distributed - 88% of households were covered under PDS in September 2020 and received approximately 24 kg of grain per month. However, the average quantity of grain received from PDS was approximately 3-4 kg less than the Centrally announced quantity of 7 kg per person per month in September 2020.

The Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) proved to be an important tool for generation of employment and income during the lockdown and later. However, there are limitations in access. Of the respondents who tried to get employment under MNREGA in August 2020, only 39% reported receiving at least some days of work. This estimate fell from 55% in June 2020, indicating a trend of increasing unmet demand for MNREGA work.

Self-Help-Groups (SHGs)

The survey shows that SHG members reported better access to food rations, MNREGA work and cash transfers than non-SHG members between May 2020 and September 2020. Approximately, 90% of the respondents reported having an SHG in their village, pointing to the growing coverage of the Deendayal Antyodaya Yojana – National Livelihoods Mission. 40% of SHG members also reported that the moratorium on their remaining SHG loans have been extended by a year.

However, SHG households showed higher signs of food insecurity and were more likely to reduce meal sizes. This is not surprising since SHGs have a high representation of the poorest and most vulnerable households.

Integrated Survey and Administrative Data

A unique design feature of the household survey series was a common geographic frame with the largest open-access high resolution census data on India – Socioeconomic High-resolution Rural-Urban Geographic Platform for India (SHRUG)[1]. This allowed for the combination of the rapid survey data with census information on population, economic and socio-economic for the sample villages over the past 25 years. Using this combined dataset, the study finds that access to urban areas is important for unemployment recovery in rural India and that villages with higher baseline poverty were also worst hit in terms of food insecurity. Interestingly, average MNREGA wage rates reported appear to be positively targeted - wages are reported to be higher in villages with higher baseline poverty.

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[1] For more details: http://www.devdatalab.org/shrug

INTRODUCTION

Background

In 2020, COVID-19 shook the world with its devastating impact on public health systems, economies and markets, inflicting unimaginable damage across the globe in terms of human life, jobs, incomes and well-being. The ongoing pandemic and its associated containment policies have resulted in widespread social and economic distress. The Government of India announced a nation-wide lockdown on 24th March, 2020. This was rolled back in phases by 30th June, 2020. The economic consequences of the lockdown are expected to not only outweigh the direct effects of the pandemic itself (Ray and Subramanian, 2020) but also have an impact across sectors. While more than 4 million Indians below the age of 30 years lost their jobs during the pandemic (International Labour Organization and Asian Development Bank 2020), migrants and casual daily labourers faced significant economic distress (ILO 2020) as employment opportunities continued to dwindle along with rising consumption expenditure and food insecurity concerns.

In the agriculture sector, there were fears that disruptions to trade and supply chains would severely impact India's already-weak agrarian economy. With farmers struggling to find remunerative prices for their Rabi harvests, there were also concerns that the pandemic would weaken their ability to purchase inputs for the upcoming Kharif season, creating a hard-to-break vicious cycle that would require significant policy support (BBC, 2020). At a macro-level, however, the country and the economy kept adjusting to new normals as the crisis transitioned through different phases over time.

To ameliorate the impact of the crisis, the government deployed various relief packages covering several sectors. Most notably, these relief measures took the form of cash and in-kind transfers under the Pradhan Mantri Garib Kalyan Yojana (PMGKY), free and subsidised ration support under India's extensive Public Distribution Systems (PDS) along with enhanced wages and work days under Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), the country's flagship employment guarantee programme. Alongside, the Deen Dayal Antodaya Yojana-National Rural Livelihood Mission (DAY-NRLM), which has mobilised 67 million India women into Self-Help-Groups (credit and savings groups) and strives to empower rural women (World Bank, 2020), was deployed as an additional tool to boost relief.

Keeping in mind the rapidly evolving nature of the pandemic and government's policy response to it, the COVID19 Rural Economy Survey had three major objectives:

- Understand the economic effects associated with COVID-19 on the rural economy and how these effects have varied over time
- Understand the efficacy of government relief packages in terms of coverage and quantity of relief distributed
- Understand changes in the agriculture sector, specifically with respect to cropping patterns, input expenditure and use, and borrowings.

This report is organised into four sections. The first section provides an introduction to the survey design and overview of the sample's demographic profile. Then, the methodology section discusses in detail the mode of survey and sampling frame. This is followed by the results section which is further sub-divided based on the six modules covered in the survey. Subsequently, results on a few key outcomes are presented using a combined dataset of the rapid household survey data and pre-existing government administrative and census data. Finally, the concluding remarks present the limitations of the survey and scope for further work.

METHODOLOGY

About the survey

The three rounds of rapid phone-based sample surveys across six Indian states were carried out to understand the impact of the COVID-19 crises and household's access to relief measures. The first round was conducted in the period May 5-10, 2020, the second round took place between July 19-23, 2020, and the final round was completed between September 2024, 2020. In each of the three rounds the study covered approximately 5000 households in a partial panel design[2].

The survey comprised a demographic section and six major thematic modules. The first module covered income and employment of non-agricultural workers; the second one aimed to understand consumption expenditure and food security. In the third module, households who reported cultivating land as their primary occupation were presented with questions on agriculture (acreage, fertiliser consumption, cropping patterns and borrowings). The fourth module focused on migration patterns and work availability for migrant workers. The next one sought to understand access to relief for households in the form of monetary transfers, PDS, MNREGA employment and support from Self-Help Groups. The final module included questions related to awareness of COVID-19-related symptoms, preventative practices and health-seeking behaviour during the lockdown.

Data was collected by IDinsight's Data-on-Demand (DoD) infrastructure[3]. In line with generally accepted best practices related to large-scale phone surveys, the interactions with respondents were short (24 minutes on average) with focused questions to ensure effective responses and data quality.

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[2] 4576, 5005 and 5200 households were covered across three rounds, respectively. The sample size varies slightly across the rounds due to differences in the sample frames and response rates.
[3] The DoD infrastructure oversaw the recruitment, training and management of enumerators. A range of quality checks were applied across the data collection cycle, including audio audits, back checks, automated logic checks, and others.

Sampling Strategy and Methodological Limitations

The sample for the survey was constructed by drawing from three prior IDinsight surveys, and from a study of the National Rural Livelihoods Mission commissioned by the Ministry of Rural Development. The samples from the previous surveys represented populations of each state separately —and in some cases were representative of only a sub-population within the state (for example, households with pregnant and lactating women, rural households, and so on). Notably, each sample had distinct design features. The survey covered between 500 and 1000 households in each state. This number, in most cases, is sufficient to make inferences about the state population with a reasonable margin of error. Appendix 3 contains more details about the sampling frames used in the survey.

To the extent that the data allowed, sample weights were applied to reduce bias, to make cross-state comparisons more accurate and to facilitate pooled analysis across the six states. Thus, for some indicators, estimates are likely to be biased with respect to overall state populations. This bias gets exacerbated when estimates across states are examined: the pooled data are not formally representative of the states they cover. Overall, these estimates are broadly and directionally valid, and are reasonably indicative of trends within these states--and more so of the rural population across these states. Even then, the user should take care while making interpretation and observation. The analytical challenges and methods employed to overcome them have been described in Appendix 4.

Sample Description

Based on the sampling strategy above, there is significant socio-economic variation in the sample: 60-70%[4] of the sample respondents had not graduated from high school, and 35-46% of the respondents belonged to a Scheduled Caste or Scheduled Tribe. The sample across the three rounds is predominantly rural and agrarian, with 58% of households reporting cultivation of land. Across the sample, 14-23% of respondents reported that at least one member of their household was a migrant worker before the lockdown and 33-42% reported self-help group membership.

Attempts were made to increase female participation in the survey to overcome anticipated gender imbalances in phone ownership and access, and the survey's focus on agriculture (with the expectation that mostly men would identify as farmers**)**. As a result, 12-15% of the agricultural households surveyed had female respondents. For the other modules, 26-33% of the respondents were female.

RESULTS AND DISCUSSION

3.1. Agriculture

India's agricultural sector, as the survey shows, has proven to be resilient in the face of unprecedented headwinds and is a source of optimism for the Indian economy in the long

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[4] We report a range while describing the sample as there are variations across the three survey rounds due to differences in the sample sizes.

term. This section outlines the results of changes in the agriculture sector during the pandemic, specifically with respect to cropping patterns, fertiliser expenditure, agricultural borrowings and PM-KISAN.

At the outset, it is important to note that evidence on impacts of the pandemic on the food security and agricultural systems is scarce and still emerging. Secondary evidence suggests that lockdowns in the summer led to disruptions in farm activity across the country. Reverse migration from states like Punjab to Bihar seemed to have negatively affected the spring harvest (Kumar et al. 2021). Preliminary analyses have indicated a total system productivity loss between 9% and 21% (Singh et al. 2020). Farmers producing perishables, such as milk and fruits (mangoes, litchis, melons and watermelons) suffered considerable losses due to a collapse in domestic demand and disruption of export markets (Rawal et al. 2020).

However, despite the severe lockdown-induced distress, evidence of a structural break in food prices has not been found, suggesting resilience in the Indian agricultural market (Cariappa et al. 2020). Underscoring this resilience, the data shows that area under cultivation had slightly increased in comparison with that of Kharif season 2019, while input expenditure and agricultural borrowings have reportedly fallen with significant heterogeneity across regions and farmer types. Monitoring these trends on a regular basis is critical, as it is unclear whether they reflect rationalisations in fertiliser application, or reduced access to capital for input expenditure (*see Appendix 2 for a more detailed analysis*).

In the midst of these developments, the results indicate some early evidence on the effectiveness of existing policy initiatives in agriculture. Similarly, while it is too soon to assess the impact of India's recent agricultural market reforms, observations on early trends related to marketing locations for Kharif 2020 as well as farmer sentiments for the Kharif harvest appear positive and these findings are presented below.

Acreage

One strong indicator of this optimism, as evident in the survey, is the increase in acreage under cultivation. On an average, farmers covered in the sample reported a 3% increase in area under cultivation over Kharif season 2019 in the third round of the survey. This is in line with the 4.77% increase in acreage reported by the government in September 2020 (Ministry of Agriculture & Farmers Welfare, 2020). Rates of acreage expansion were found to be consistent across states, crop type and farmer's scale of operations.

The data suggest that in addition to the good monsoons, household characteristics may have driven the increase in area under cultivation. A significant and inverse relationship between a household's consumption expenditure during the lockdown and the rate at which they increased acreage is observed. Controlling for household size and state fixed effects, this suggests that each Rs.1000 increase in monthly consumption expenditure is associated with a 0.2% decrease in the rate of expansion in acreage, further suggesting that the increase in acreage was proportionally greater in poorer households. Moreover, the expansion in acreage was specific to a small segment of the households covered (16%). Of the rest, 14% stated they reduced their area under cultivation, and 70% reported no change.

There are several other plausible hypotheses for this reported increase in acreage. For instance, the large-scale return migration witnessed in April 2020 translating into greater availability of labour for sowing, and farmers hoping to make up for a disrupted Rabi harvest. However, testing these hypotheses is beyond the scope of this report.

Fertilisers

On the other hand, expenditure on fertiliser showed mixed trends. The survey data indicates that the average farmer's fertiliser expenditure in Kharif season 2020 decreased by 1% when compared with their outflow in the Kharif season of 2019[5]**.** Overall, 57% of households reported reducing their fertiliser expenditure, with 20% reporting increases and 22% stating no change. As a caveat, it is important to note that the way in which questions related to fertilisers were phrased for a subset of respondents may have introduced anchoring and recall bias. This might have led to respondents inflating the size of their decline in expenditure. More details on this can be found in Appendix 2.

Predictably, the survey shows that changes in acreage are positively associated with changes in fertiliser expenditure. In other words, a 1% increase in acreage is associated with a 0.53% increase in fertiliser expenditure, when controlling for state fixed effects, price and application covariates. Another point to consider is the seemingly price inelastic nature of fertiliser demand – overall, 57% of farmers reported no change in their per-unit application of all fertilisers **(see Table 1)**. Among farmers who reported price rises, 56% reported reducing their expenditure. On the other hand, among farmers who reported no price rise, 51% of farmers reported reducing their expenditure. Reported changes in prices were consistent across different scales of operations[6], with 31% of farmers in the bottom quintile of scale reporting price rises compared with 30% of farmers in the top quintile.

It is evident that farmers with smaller scales of operation differ considerably in fertiliser usage patterns from larger farmers. This is determined by using fertiliser expenditure in 2019 as a proxy for farmer's scale of operations. Farmers in the top quintile of scale were more sensitive to price changes than farmers in the bottom quintile. On an average**,** farmers in the bottom quintile of scale (spending Rs.1100 on fertilisers in Kharif 2019) reported a 33% increase in fertiliser expenditure in Kharif 2020. **The size of this increase steeply declines as one moves up the scale of operation quintiles** and culminates in a 43% decline in fertiliser expenditure for farmers in the top quintile of scale (spending ≃Rs.54,436 on fertilisers in Kharif 2019).

While the reason for this shift in spending patterns is beyond the scope of the survey, it could possibly point to a transition towards more judicious use of fertilisers. Among other possible reasons is that the rise in fertiliser expenditure among smaller farmers is due to higher prices reported and the relatively higher fertiliser price inelasticity for these farmers.

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[5] When we expand the sample to include respondents potentially affected by anchoring bias, the average farmer reports a 13% decline in fertiliser expenditure.

[6] Fertiliser expenditure in 2019 was used as a proxy for a farmer's scale of operations

Graph 1 shows that among those reporting price rises, irrespective of changes in acreage, farmers in the top quintile reduced their fertiliser expenditure relatively more than farmers in the bottom quintile[7].

Table 1: Percentage of Agriculture Households by Changes in Reported Prices and Fertiliser Expenditure

Price Change	Expenditure increased	Expenditure decreased	Expenditure did not change	Sample Size
All prices rose	25%	56%	19%	702
No prices changed	20%	51%	29%	439
Overall	20%	58%	22%	2175

Note that the first two rows don't add up to the total as some farmers reported differential changes across fertilisers, including price falls.

Graph 1: Percentage Change in Fertiliser Expenditure, by Change in Acreage and Prices

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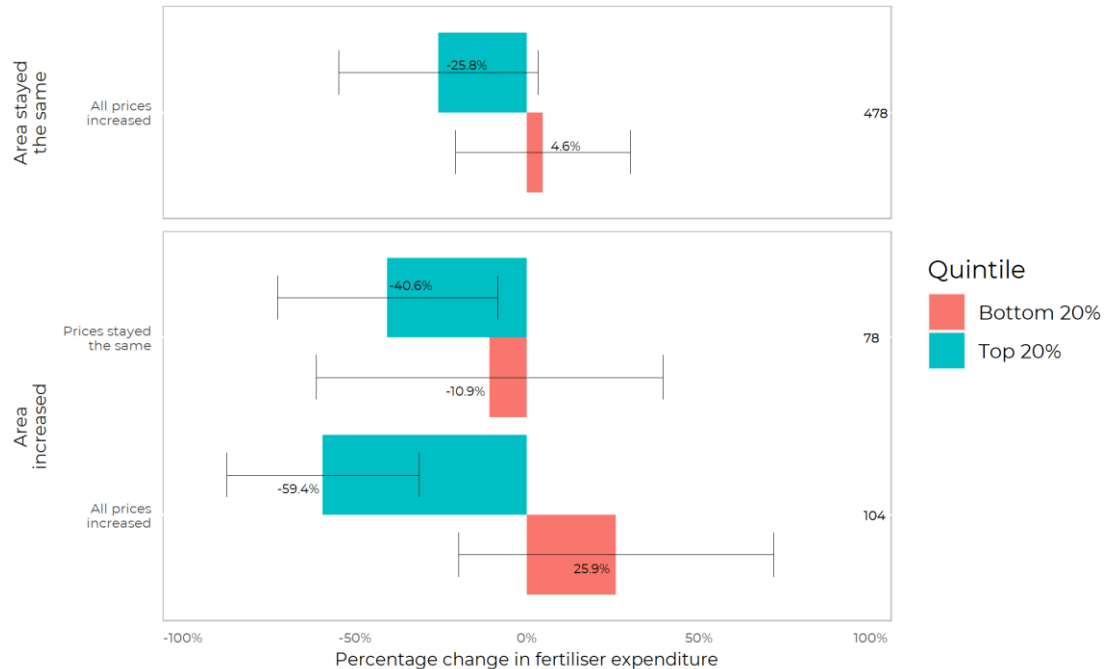
[7] These results are directionally consistent even when the sample is reduced to farmers not exposed to anchoring bias

Differential cropping patterns could possibly explain the increase in fertiliser expenditure reported by smaller farmers. Analysis of Cost of Cultivation data from 2007 to 2013 suggests that the price elasticity of fertiliser demand is particularly inelastic for cereal farmers. These values were -0.03 for paddy and wheat farmers and -0.15 for maize farmers (Kishore, 2018). This is borne out in this survey data as well: in the sample, perishable crop farmers reported reducing their fertiliser expenditure by an average of 41%, while cereal farmers reported a decrease of 11%. Furthermore, 14% of farmers in the top quintile reported growing perishables as their primary crop, compared with less than 1% of farmers in the bottom quintile.

In contrast to these results, industry estimates regarding fertiliser demand showed positive trends for the same period. The rise in reported fertiliser sales was predicated on a successful monsoon season. Dealers were also found to be stocking up in anticipation of the Kharif season. Additionally, reports suggested that migrants who returned to their rural homes were expected to participate in the rural economy and push up the demand for fertilisers (J M Baxi Group, n.d.). Lastly, domestic fertiliser output had also recovered in May 2020 after a steep decline in April 2020 (Argus Media 2020).

Agricultural Borrowings

Borrowings for agriculture, on the other hand, showed a sharper slide than spending on fertilisers. On an average, farmers in September 2020 reported a 11% decrease in agricultural borrowings as compared with Kharif 2019. Borrowings drawn on Kisan Credit Cards also reportedly declined by 11% during this period. The decline was the greatest in Uttar Pradesh (-32%) and Jharkhand (-22%), and the least in Rajasthan (no change over 2019).

The survey findings related to the overall reduction in agricultural borrowings corresponds to the RBI's reported decline in agricultural credit growth, from 6.8% in August 2019 to 4.9% in August 2020 (Reserve Bank of India, 2020). On restricting the sample to respondents not affected by potential anchoring bias, the average farmer reports a 2% decline in agricultural borrowings.

Further analysis shows that increases in acreage and fertiliser expenditure are positively associated with changes in borrowing. When controlling for state fixed effects, scale of operations, price and application covariates, a 1% increase in borrowing is associated with a 0.05% increase in acreage and a 0.12% increase in fertiliser expenditure. Among farmers who reduced borrowings, 46% said they did so because they had enough savings and did not require a loan. Thus, the decline in borrowings can be interpreted in a number of ways: it may reflect a farmer's ability to finance investments through his or her own savings, but may also reflect more systemic constraints on access to credit.

Agricultural borrowings appeared positively correlated with farmers scale of operations. On an average, farmers who were in the bottom quintile of scale (spending ≃Rs.1100 on fertilisers in Kharif 2019) reported a 30% decrease in borrowings over the year. The size of this decline steeply reduced as one moved up the scale of operation quintiles, culminating in

a 3% increase in agricultural borrowing for farmers in the top quintile of scale (spending Rs.54,436 on fertilisers in Kharif 2019). This pattern of borrowing across quintiles of scale could point to potential issues of access. However, farmers in the bottom quintile were as likely to report sufficient savings to cover reduced borrowings as farmers in the top quintile.

Cropping Patterns

Much like borrowings, the survey showed significant differences in cropping patterns between large and small farmers. Notably, 14% of farmers in the top quintile report growing perishables as their primary crop, compared to less than 1% of farmers in the bottom quintile. Further, approximately 9% of farmers reported changing the cultivation of their primary crop of Kharif 2019. Among these farmers, 74% reported switching to cultivation of cereals and 24% reported cultivation of pulses and oilseeds.

Across states, Rajasthan (29%) and Andhra Pradesh (22%) reported having the largest share of pulses as a primary crop. Other than Andhra Pradesh (29%), no other state reported more than 2% of farmers growing perishables as their primary crop. In both Rajasthan and Jharkhand, 18% of farmers reported crop shifts. A likely reason for this change could be the perceived 'volatility' of perishable crops.

PM-KISAN

The survey examined the Pradhan Mantri Kisan Sammann Nidhi (PM-KISAN) exclusion rates, introduced through both enrolment and execution, as well as its effectiveness in improving agricultural investments. PM-KISAN is the government's largest scheme in agriculture in budgetary terms and is critical to the debate between cash and in-kind transfers in India. Under this initiative, all farmers will receive up to Rs. 6000 per year (in three instalments) as minimum income support (subject to eligibility criteria).

58% of eligible[8] farmers reported receiving PM-KISAN transfers since January 2020. Among these recipients, the average amount reported to have been received since January was Rs. 4404, corresponding to the two tranches of Rs. 2000 released between April-July 2020 and August-November 2020.

On an average, ineligible[9] households appear more disadvantaged than eligible households. Ineligible households report spending less on an average, were more likely to belong to SC/ST caste groups, and were more likely to have BPL ration cards (**see Table 2**). Recipients also reported increasing their fertiliser expenditure by 3%, while eligible non-recipients reported reducing their fertiliser expenditure by 12%[10].

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[8] Defined as land-owning farmer families, excluding specific types of individuals (for example, government employees, salaried workers and others).

[9] Eligibility was limited to land-owning farmer families

[10] Non-eligible farmers reduced their fertiliser expenditure by 15%.

The survey found that recipients with a smaller scale of operations increased their fertiliser expenditure more than recipients with a larger scale of operations (see Table 3). This is likely due to design, as the scheme is limited to land-owning farmer families – a formulation that leaves out tenant farmers, who are among the most disadvantaged farmer groups in the country.

Table 2: Respondent Demographics, by Status of PM-KISAN Eligibility

Demographic	Recipient	Eligible Non-Recipient	Ineligible
Average weekly consumption expenditure in September	Rs. 1994	Rs.1881	Rs.1731
Scheduled Caste %	22.7%	21.2%	25.9%
Scheduled Tribe %	11.5%	19.1%	18.9%
BPL Status	53.1%	57.4%	58.9%

In contrast, there appears to be limited systematic exclusion in execution. There do not seem to be major demographic differences between recipients and non-recipients. Even in agronomic terms, rates of receipt were consistent across farmers' scale of operations, with 61% of eligible farmers in the bottom quintile of scale of operations receiving PM-KISAN transfers, compared with 60% in the top quintile. Given the relatively larger impact of cash transfers among smaller farmers, continued improvements in the implementation of the scheme and a more progressive policy design may introduce significant improvements in both welfare and agricultural investments by smallholders.

Table 3: Changes in Fertiliser Expenditure, by PM KISAN Receipt Status and Scale of Operations.

PM-KISAN Status	Expenditure in bottom quintile of scale of operations	Expenditure in top quintile of scale of operations	Difference	P Value of difference	Sample size
Eligible Recipients	+64%	-22.8%	86.7 percentage points	0.075	364
Eligible Non-recipients	+3%	-32.4%	35.5 percentage points	0.119	278

3.2. Income and Consumption

The impact of the lockdown on the labour market is exemplified in the sharp 16 percentage point rise in reported levels of unemployment between March 2020 and May 2020 (see Graph 1). To get a clearer perspective, the survey asked respondents to report their primary work activity and the number of days they had worked for income in the preceding week[11]. Based on responses to this question across surveys, there were indications that the labour market was showing signs of recovery after the lockdown was lifted in July 2020 but the absolute levels of unemployment were still above pre-lockdown levels of March 2020.

However, the period between July 2020 and September 2020 saw a slight recovery with approximately 7 percentage decrease in the proportion of respondents reportedly not working for income over the same period (**see Graph 2**) when compared with May 2020. The Centre for Monitoring Indian Economy (CMIE), which routinely tracks employment in India, also reported similar unemployment levels of 24-27% in April 2020 and May 2020, up by 8-9% before the lockdown started.

Evidence from other states indicates that the fall in income has disproportionately affected marginalised groups. Also, income and employment losses have been higher among Scheduled Caste (SC) and Other Backward Caste households (Singh, Singh, and Baruah 2020). When asked about the reason for not working, almost half of the respondents reported that they could not find work—which is an indication of a sluggish economy.

The survey did not find evidence that women are disproportionately being pushed out of the labour force due to the pandemic. It is noteworthy that the inverted V-shape trend of reported unemployment is similar for both men and women in the sample (see Graph 1). However, levels of unemployment for women were higher compared with men. Almost 30% of women report being currently unemployed[12] compared with 12% of men.

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[11]The estimate is defined as the number of respondents who did not work for income divided by the total number of respondents. The estimate does not distinguish between respondents who are actively seeking employment versus those that are not. The estimate takes into account employment status of the primary earner in the household and not all members within the household.

[12] Unemployment here is defined as non-participation in the labour force- that is, not working for income in the time period in question. This estimate includes individuals actively searching for work, as well as those not searching for employment.

Graph 2: Proportion of Respondents Who Reported Not Working for Income
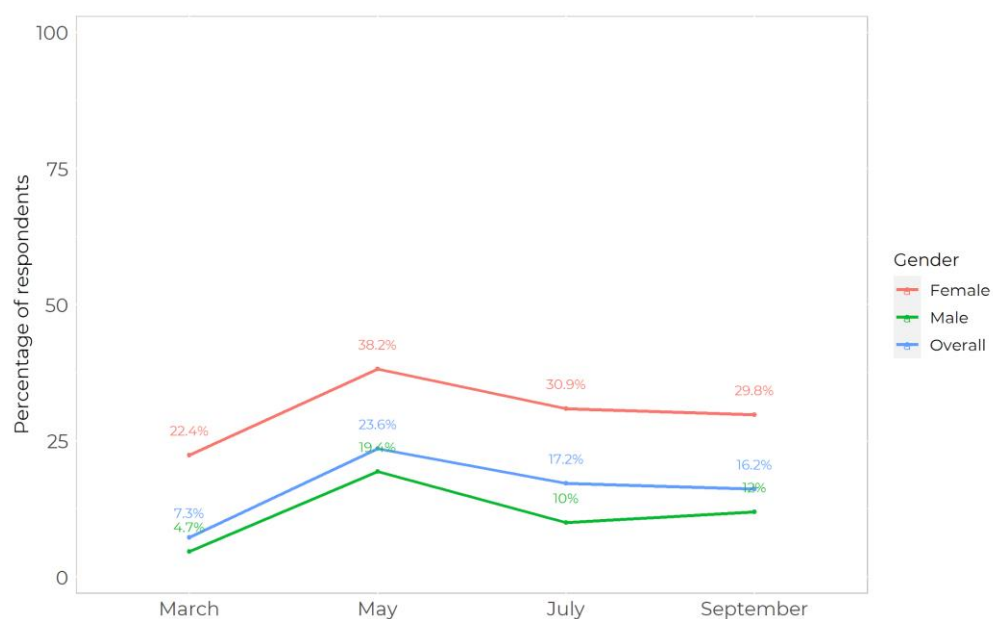
Effects on Non-Agricultural Households

As a result of lockdown measures, 37.9% of households in the sample reported a fall in income at the end of March 2020. This further increased to 43.5% of households in early April 2020. The results show that for respondents who have not lost their jobs (**see Graph 3**), there was substantial loss in both daily wages and days of employment during lockdown. The recovery was slow and far below the pre-lockdown levels in March 2020.

In line with decreases in income for households almost half of the surveyed households reported a fall in their weekly consumption expenditure during the lockdown in comparison with pre-lockdown levels. This trend continued well into July 2020-September 2020 period, indicating little positive effect of easing lockdown restrictions (in June 2020) on the income of households.

Graph 3: Proportion of Non-Agricultural Respondents by Average Daily Wage and Days Worked a Week
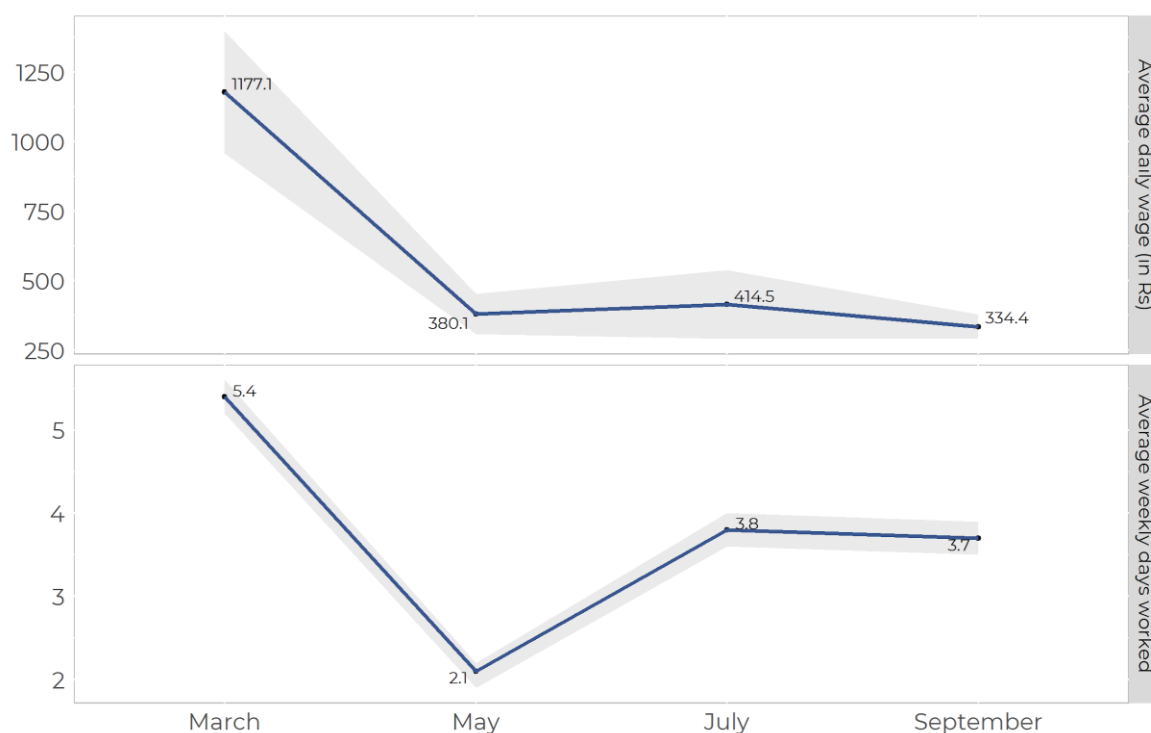
3.3. Food Security

The survey suggests that disruption in supply chain (induced by the lockdown) possibly caused a slide in consumption expenditure and reduction in diets. Another survey of vegetable producers across four states in India found reduced access to nutrient dense foods. It was also found that over 60% of households experienced some form of dietary disruption. While 80% of households managed to maintain their staple consumption, approximately 50% of households had to reduce their consumption of fruit, dairy and other animal sourced foods (Harris et al. 2020). Decreased intake in terms of quantity and diversity could leave some of the more vulnerable populations in the country at-risk of contracting not just COVID-19 but other diseases as well (Jayawardena and Misra 2020).

Overall, 30% of all households showed at least one sign of food insecurity[13] during the lockdown, an estimate which declined to 15% in September. It is important to note that

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[13] A household is considered to be showing signs of food insecurity if any member of the household experienced at least one of the following conditions in the 7 days prior to the survey: (a) limited portion size or reduced meals, (b) ran out of food, (c) they were hungry but did not eat, (d) they went without eating for a whole day. These measures were selected as they have been well-tested and calibrated for supply shock scenarios. Also, information on these criteria can be easily gathered through phone interviews. However, these self-reported, experiential measures of food insecurity are liable to miss other critical signs of distress. More details: https://blogs.worldbank.org/opendata/how-should-we-measure-food-security-during-crises-case-nigeria

food insecurity in India has high baseline levels. Data from the State of Food Security and Nutrition in the World report that 31.6% of India's population suffered from moderate to severe food insecurity in 2017-2019.[14]

The most commonly sign of food insecurity was limiting of portion sizes: approximately 26% of the households reportedly experienced reducing their meal size during a given week in the lockdown in May 2020. During this time, 6% of households also ran out of food or reported a member being hungry and not eating; 3% went without eating for a whole day. **Graph 4** shows the changes in these signs of food insecurity across May, July and September 2020, with 13% continuing to report reduced portion size in September 2020.

Graph 4: Proportion of Households Reporting Food Insecurity Dimension
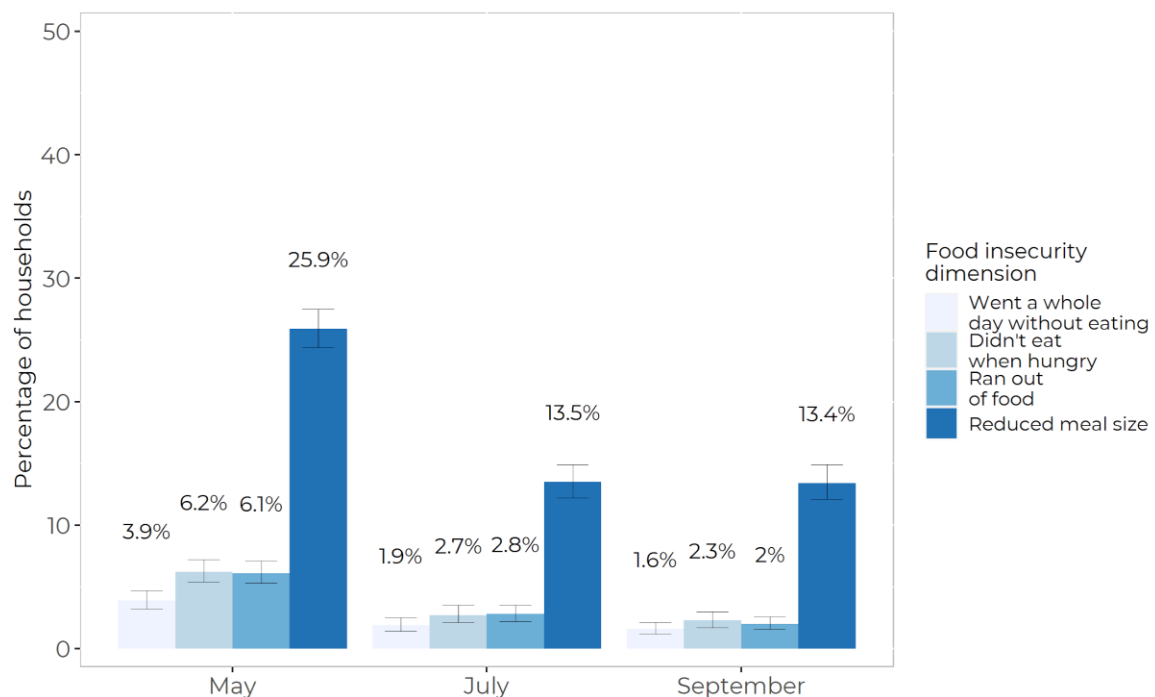
Food shortage persisted almost 3 months after the lockdown was lifted—and despite increased PDS support announced by the government under the Pradhan Mantri Gareeb Kalyan Ann Yojana. While the proportion of households showing signs of food insecurity declined post-lockdown, almost 33% of households that reported reducing portion sizes during the lockdown continued to report this reduction in September 2020.

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[14] The estimate is based on PMSFI (Prevalence of moderate and severe food insecurity) released by the United Nations. PMSFI measures food insecurity by measuring experiences such as food shortages, skipping meals, and changing diet diversity because of a lack of resources and is thus comparable to the food insecurity estimates used in this survey.

Households with the highest probability of being poor were consistently more likely to be food insecure (See Table 4). Reports of food insecurity are higher among households involved in agriculture as daily wage labour, those belonging to a scheduled caste, and those with migrant workers. Across the six surveyed states, there was considerable interstate variation. Rajasthan had 6% of households showing signs of food insecurity in September 2020. Bihar, on the other hand, had the highest proportion of households (29%)—almost double the all-state average. This is likely due to the compounded impact of the Kosi floods in July 2020 (an event which coincided with the period of survey).

Table 4: Proportion of Households Reporting Signs of Food Insecurity by Category

Category	May	July	Sep
POVERTY PROBABILITY[15]			
<25% Probability	17.9	12	7.7
25%-50% Probability	21.8	11.6	8
50%-75% Probability	23.3	11.2	10.1
>75% Probability	**29**	**14.8**	**16.6**
CASTE			
General	23.4	11.2	12.7
Scheduled Caste	**27.1**	**15.4**	**13**
Scheduled Tribe	25.8	11.4	12
Other Backward Caste	26.1	13.5	12.6
OCCUPATION			
Cultivating land	21	10.3	11.5
Daily Wage Labour in Agriculture	**45.9**	**21.9**	**20.9**

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[15] A respondent's poverty probability indicates their likelihood of failing under the $3.80-a-day poverty line, calculated through the Poverty Probability Index, which incorporates asset ownership and socio-economic data

Daily Wage Labour in Non-Agriculture	30.8	17.8	14.8
Did Not Work for Income	35.7	19.9	22
Salaried Job in Government	19.5	7.3	8.2
Salaried Job in Private Company	31.6	12.9	4.4
Self-employed in Non-Cultivation	26.9	18.6	8.7
Other	32.7	16.4	11.9
MIGRANT WORKER			
Yes	**32.1**	**16.8**	**17.6**
No	24.8	12.8	12

Note: The figures in bold are the highest proportion reported in the category

3.4. Migration

The imposition of nationwide lockdown in March 2020 resulted in loss of jobs and income for hundreds and thousands of migrant workers. With no means of employment, many of them started returning to their native villages. In the survey, 23% of the respondents reported that at least one member of their household was a migrant worker before the lockdown. Of these migrants, approximately 78% are reported to have returned to their hometowns/villages from their place of work by August 2020.

The survey found significant job losses for migrants with almost 64% of highest earning migrants reporting zero days of work during the lockdown[16]. While this estimate has steadily declined over subsequent rounds of survey, 50% of migrants still reported zero days of work in September 2020. Juxtaposing this estimate with the overall unemployment of 16% exposes the vulnerability of migrant workers in coping with external shocks. Additionally, the outflow of migrant labour from states such as Punjab and Haryana (often referred to India's breadbasket) has led to short- and long-term concerns about agricultural production and consequently, national food security (Singh et al. 2020).

In September 2020, there was a noticeable change in responses to questions on migration: returned migrants were more willing to return to their work village/ town. About 46% of the returned migrants reported that they are planning to relocate to their place of work by

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[16] Due to limits on the lengths of the questionnaire, survey questions were limited to include details for only the highest-earning migrant

the end of that month. This estimate had approximately doubled from July 2020 when only 20% of returned migrants indicated an intent to leave their home villages. This suggests that while reverse migration did displace labour from cities, this reduction in urban workforce did not persist in the near future. In a parallel survey in June 2020, Kesar et al. (2020) also found that around 47% of migrants would like to immediately return to work-sites post the lockdown.

A possible reason for this willingness to return to work sites was limited opportunities for employment in their native place. 74% of the highest-earning migrants reported being present in their hometown in September 2020. For them, the average number of days of work per week was 1.6 compared to the average of 4.9 days of work per week reported by migrants working in their work town in September 2020 (**Table 5**). These results must be interpreted with caution as there was a higher supply of migrant labour in the hometown/ village than in the work town/ village, and could have potentially depressed the average number of work days. In such a context, migrant-specific relief and workfare programmes like the Garib Kalyan Rozgar Abhiyaan have a crucial role to play since they have the capacity to absorb some of this expanded labour force and alleviate the heightened distress of migrant households.

Table 5: Average Number of Working Days per Week by Migrant Current Location

Category	May	July	Sep
Migrants currently in home town	1.7 (1150)	1.6 (622)	1.4 (732)
Migrants currently in work town		4.9 (285)	4.1 (230)

Note: The numbers of highest-earning migrants in each category are presented in parenthesis. Data for migrant location was not collected for May.

3.5. Access to Relief

On a broader scale, the Government of India announced various relief measures to address the stressful situation that poor and vulnerable households were facing during the pandemic. Of the lot, the Pradhan Mantri Grameen Kalyan Yojana – a Rs. 1.7 lakh crore relief package, deserves a specific mention. In this section, relief in the form of monetary transfers, MNREGA employment support, ration supplies from PDS systems and support from Self-Help

Groups are discussed. **Table 6** provides a summary of access to relief by category of households.

Table 6: Proportion of Households with Access to Relief Measures by Household Category

Category	Received Monetary Support	Received Free Grains from PDS	Received MNREGA Support
POVERTY PROBABILITY			
<25% Probability	30.1	**96.4**	**69.4**
25%-50% Probability	39.3	91.7	68
50%-75% Probability	47.8	93.5	66.8
>75% Probability	**55**	91.4	50.4
CASTE			
General	47.1	**92.6**	58.6
Scheduled Caste	51.1	**92.2**	59.1
Scheduled Tribe	**55**	89.9	54.8
Other	47.7	**92**	**66.8**
Other Backward Caste	51.4	91.6	53.3

Note: The proportions are reported for June 2020

MNREGA Employment Support

The Government's flagship employment programme MNREGA has been one of the main pillars of support in providing relief to rural households during times of crisis. The lockdown tested the efficacy and reach of the programme as it attempted to fulfil the additional (over regular) demand of workers looking for employment and income. However, of the respondents who tried to get MNREGA work in August 2020, only 39% reported receiving at least some days of work. This estimate was higher at 55% in June 2020.

In contrast to the survey, the MNREGA MIS[17] reported meeting approximately 85% of the employment demand till August 2020. The reason for the discrepancy could be that MIS captures data related to demand for work in a different way: it does not register everyone who is looking for MNREGA work. MNREGA stipulates that the work demanded must be fulfilled within 15 days of registering in the MIS; failing which the state will invite the penalty of providing unemployment allowance (Chopra, 2015). This has been critiqued for creating a disincentive for the state to adequately capture demand and report it.

There was growing unmet demand for MNREGA work between June 2020 and August 2020 across all six surveyed states. The variability in implementation of MNREGA across states is reiterated across studies (Khera 2011). In this survey, MNREGA-seeking respondents in Madhya Pradesh (18%) and Bihar (19%) were least likely to find work. **Graph 5** shows the proportion of respondents who received at least some days of work from the state for June 2020 and August 2020. This apart, there have been considerable delays in payment beyond the stipulated 15 days guaranteed under MNREGA. For instance, more than 50% of respondents who worked under MNREGA experienced delays in wage payments in June 2020 and August 2020.

Graph 5: Proportion of Households Receiving Some Days of MNREGA Work by State


The survey finds that the upward revision in MNREGA wages have been transferred to the ground for all states except Rajasthan and Andhra Pradesh[18]. Graph 6 shows the state-wise comparison of the announced wage schedule and the reported average wages received by MNREGA workers. In the case of Andhra Pradesh, it is noteworthy that MNREGA-seeking respondents – who are most likely to receive work – have reported receiving wages that are Rs. 7 less than the average wage reported in their MNREGA MIS reports (Rs. 198.95)[19].

Graph 6: Comparison of Announced MNREGA Wages and Reported Wages by State

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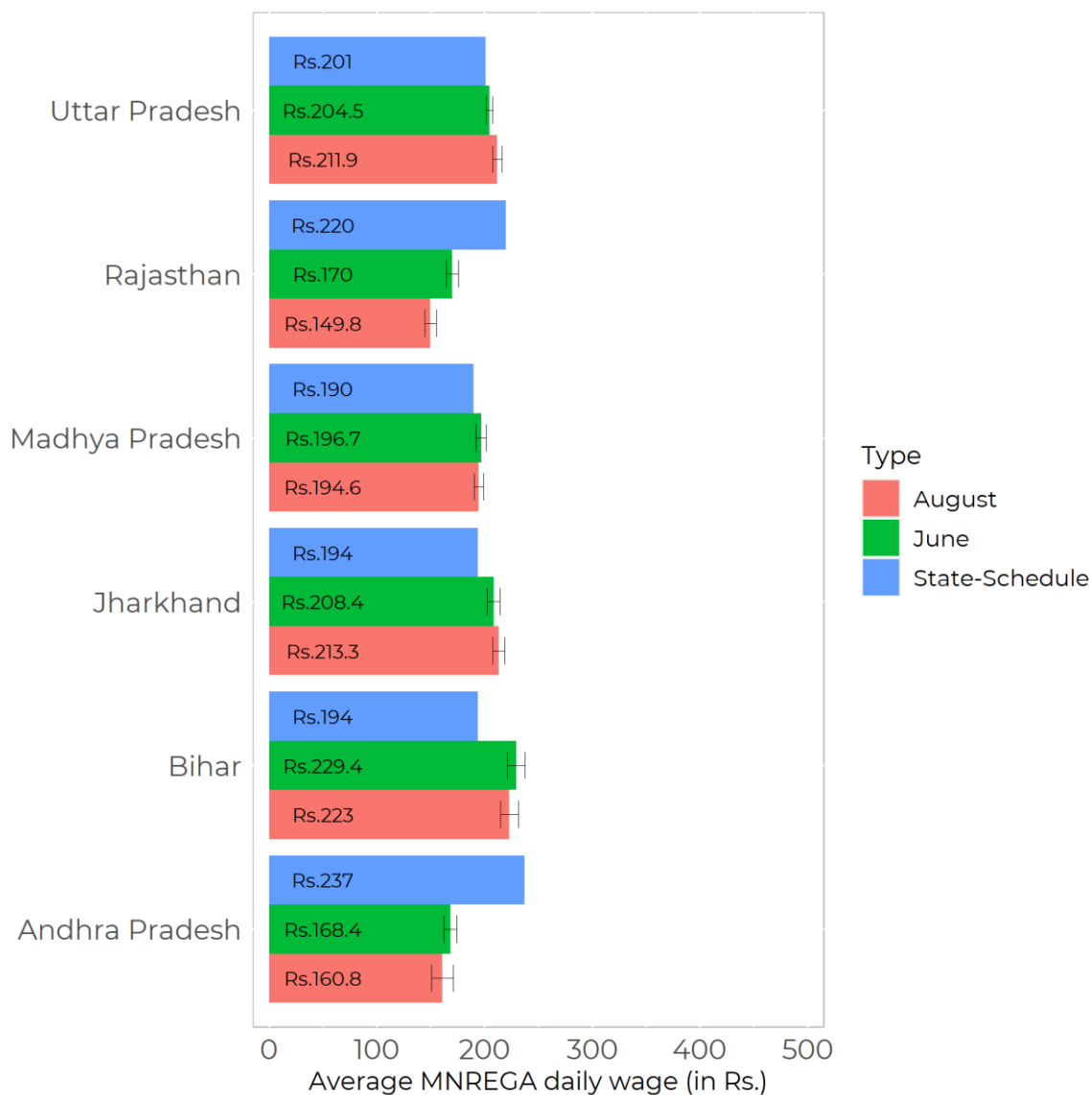
[18] MNREGA wages were revised upwards in all states effective 1st April 2020. Source: GOI notification https://nrega.nic.in/netnrega/writereaddata/Circulars/2410Wage_rate_notification_for_FY2020-21.pdf. The daily wages increased by an amount equal to or greater than Rs.10 for six states and by an amount equal to or greater than Rs.5 for 17 other states (Chakraborty and Thomas, 2020).

[19] MNREGA MIS: http://mnregaweb4.nic.in/netnrega/all_lvl_details_dashboard_new.aspx?Fin_Year=2020-2021&Digest=ueg/HtV54GGJ8ZQ6GUB2ew

Ration Supplies from Public Distribution Systems (PDS)

In comparison to MNREGA, PDS beneficiary coverage is high as is the quantity of relief distributed. Almost 88-90% of respondents who were eligible to receive free rations reported receiving either rice, wheat or pulses for free from the PDS shops in June 2020 and August 2020. Similar access levels were found by a survey conducted by Gaon Connection (Gaon Connection, n.d.). On an average, households received 22–24 kg of free wheat and 20-25 kg of free rice. The amount of free wheat ranged from 36–38 kg in Rajasthan to 15-17 kg in Uttar Pradesh.[20]

Interestingly, PDS appears to meet 76% of the cereal demands of households. The survey arrived at this percentage after asking respondents to report the quantity of wheat/rice received from PDS shops as well as any additional wheat/rice that the household had purchased from non-PDS shops. The ratio of the quantity of wheat/rice received from PDS shops to the total quantity of wheat/rice needed by the household (proxied by the quantity purchased from both the PDS and non-PDS shops) was calculated to measure the sufficiency of PDS in meeting households' food needs.

However, there are two caveats to be considered. One, the average quantity of wheat/rice received from PDS is approximately 3-4 kgs per person per month. This is less than the 5 kg per person per month guaranteed under the National Food Security Act, 2013[21]-- a quantity that was supplemented by an additional 2 kgs of grain[22] per person from April to November. Secondly, food insecurity persists despite high PDS coverage. More than 100 million poor people are estimated to be excluded from PDS because of lack of ration cards (Dreze, Khera, Mungikar 2020). This underscores the need for increased and continued PDS support from the government besides pragmatic measures to reduce exclusion rates from PDS.

> **Access to MNREGA work and PDS is higher among SHG member households vis-a-vis non-SHG member households.** In July, approximately 60% of SHG households reported working for some or all the days on which they sought MNREGA work. This is about 10 percentage points higher than the proportion of non-SHG households and could point to the success of the convergence initiatives undertaken by DAY-NRLM and MNREGA. 93% of SHG

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[20] Note that, due to limitations on duration of survey interviews, it was possible to collect data only on quantities of one staple grain (either rice or wheat) per household. The choice of grain was determined on the basis of NFSA distribution data.

[21] Source: Press release by GOI https://pib.gov.in/Pressreleaseshare.aspx?PRID=1575590#:⁓:text=As%20per%20entitlements%20under%20the,foodgrains%20per%20person%20per%20month.

[22]Source: https://economictimes.indiatimes.com/news/economy/policy/govt-to-supply-7-kg/person-subsidised-foodgrains-under-pds-for-3-months-food-min-official/articleshow/74825576.cms?from=mdr

Cash and Bank Transfers

Along with MNREGA and PDS, cash and bank transfers played a key role in providing support to rural households during the lockdown. Almost 51% of all households reported receiving monetary relief from the government in June 2020 either as a direct transfer to a bank account or in cash.[23] The proportion in June 2020 is 10 percentage points lower than that of April 2020, suggesting a gradual decline in coverage of monetary relief between April 2020 and June 2020[24]. Several other surveys and research studies have found similar estimates. This includes livelihoods impact survey by Azim Premji University and a study by Afridi, Dhillon & Roy in May 2020. The JAM (Jan Dhan-Aadhar-Mobile) trinity has been vital in increasing the viability of Direct Benefit Transfers in Rural India. Almost 97% of respondents in the sample had a member of the household with a bank account.

Importantly, the mobility restrictions placed during the lockdown did not impact respondents' ability to withdraw cash transfers. In June, only 3% of the respondents who had tried to withdraw the amount received were unable to do so. Majority of the respondents (44% and 37%, respectively) used business correspondents/bank *sakhis* and ATM/bank branches as their primary mode of withdrawal for money received in June 2020.

On the flip side, however, cash transfers appear to be regressive, with richer households receiving larger amounts in monetary assistance from the government. For example, the average amount of monetary relief received by households in the highest wealth quartile was Rs. 2825 in June 2020 compared with Rs. 1299 for households in the lowest wealth quartile. The upward sloping line of **Graph 7** depicts a similar trend in terms of weekly income of households. While cash transfers appear to have been vital during the pandemic, improving the targeting efficiency of transfers can further increase their effectiveness (Kesar et. al, 2020).

Graph 7: Quantity of PDS Relief Received and Amount of Cash Relief Received in June by Weekly Income

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[23] The survey findings are in line with estimates obtained by UNICEF and the Population Council, who find that 55% of households in Bihar received cash benefits from various social protection schemes.

[24] Questions on access to cash and bank transfers were not asked in the final round of survey conducted in August as most of the cash transfer schemes announced by the government were applicable till June.
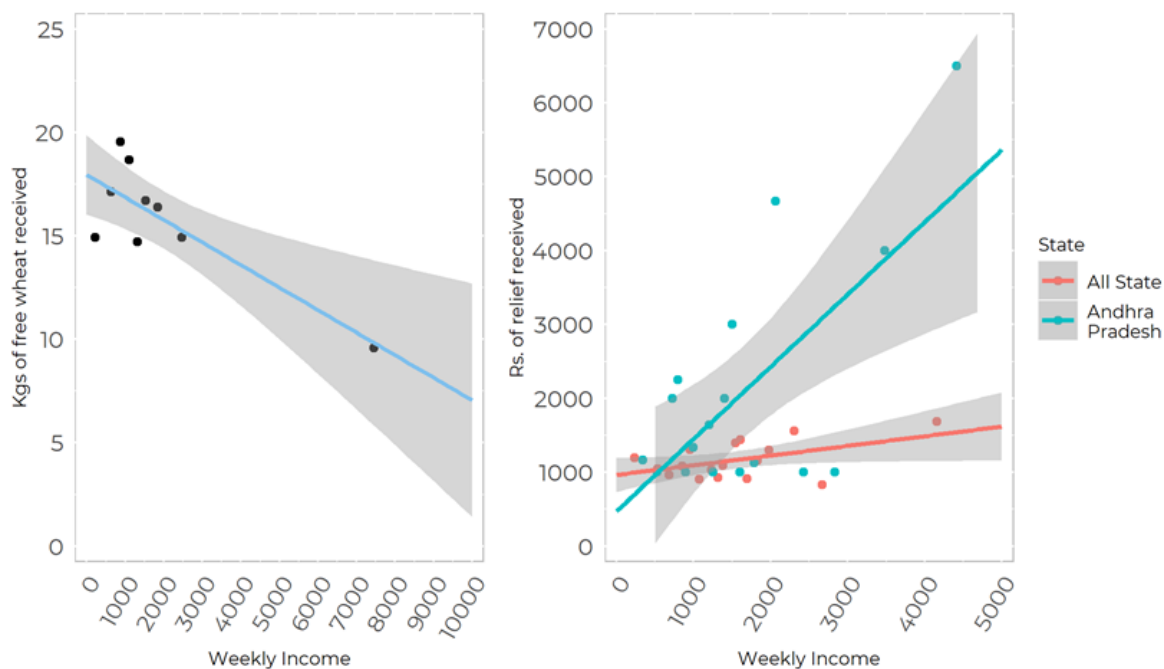
Among states, Bihar reported the highest proportion of households (66%) receiving monetary relief and Andhra Pradesh the lowest (36%) in June 2020. In May 2020, however, the proportion of households receiving monetary relief in Andhra Pradesh (75%) was significantly higher than other states. The average relief amount also decreased by 12% between April and June, indicating gradual withdrawal of cash support. Among households that received relief, the average cash transfer by the government in a month was Rs.1445 in June, ranging from approximately Rs.1071 in Uttar Pradesh to Rs.2866 in Andhra Pradesh.

Self-Help Groups

Evidence suggests that transfer and welfare schemes work better with efficient linkages between Government agencies and households. In this regard, Self-Help Groups (SHGs) can play a catalytic role in facilitating Government transfers to beneficiaries given their reach and penetration among households. Approximately, 90% of the respondents reported having a SHG in their village, pointing to the growing coverage of the DAY-NRLM. Under the program, 67 million rural women have been successfully mobilized into credit and savings groups.

SHG members reported better access to food rations, MNREGA work and cash transfers than non-SHG members between May 2020 and September 2020 (Graph 8). Given the coverage of the SHG network, these groups can be leveraged to improve the targeting efficiency of government welfare programmes. However, according to the survey, SHG households showed higher signs of food insecurity and were more likely to reduce meal sizes. This outcome is not unexpected since SHGs include households from among the most vulnerable sections in society. Addressing this lacuna confirms that vulnerability reduction mechanisms continue to be required for some proportion of this population.

Graph 8: Proportion of MNREGA-seekers Receiving Work, by SHG Membership Status and Month

Percentage of MNREGA applicants who received some work in MNREGA
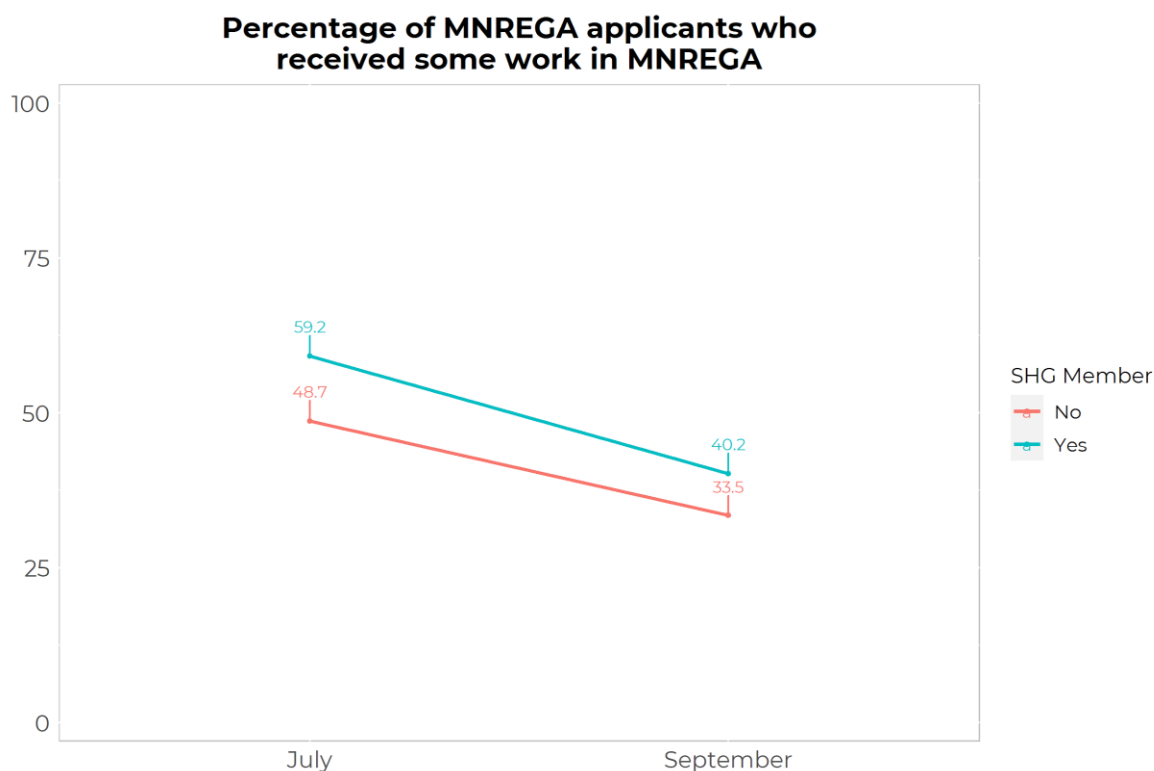
In villages with active SHGs, 69% of households reported receiving COVID-19-related support from these groups in September 2020. The pandemic period saw SHGs evolving and assuming new roles to take on the challenges. These groups have been crucial in supporting the COVID-19 response of the government by manufacturing personal protective equipment and sanitizer providing free meals to the needy in addition to helping health and administrative officials on the field (Banerjee 2020), and also ensuring last mile delivery and awareness about the pandemic (World Bank, 2020). A study by the Population Council also found that almost half of the SHG leaders were engaged in COVID-19-related community awareness and prevention activities in Bihar.

These surveys also found that some of the traditional functions of SHGs (as a loan provider) were relegated to the background during this period. For instance, only 1.5% and 0.6% of SHG households reported taking economic loans and consumption loans respectively from SHGs in the month of June 2020. This increased to 2% for both types of loans in September 2020.

3.6 Health

Around 10%-12% of all households in Rajasthan and Jharkhand[25] reported foregoing healthcare due to COVID-19-related fears and restrictions in September (Table 7). Given that only a small subset of households are likely to engage in health-seeking behaviour in a given month, this number reflects the high opportunity cost of providing preventative and remedial health care against COVID-19 (in that care for non-COVID-19 illness was deprioritized) (Jain and Dupas 2020). The estimate is not different from the previous two rounds, where 11% and 10% reported forgoing healthcare in May and June.

Nearly 70% of all households in Rajasthan and Jharkhand reported knowing the three key symptoms of COVID-19 (cough, fever and breathlessness), while around 82% were aware of at least one protective measure that could be adopted to prevent the spread of COVID-19 (such as handwashing, physical distancing and wearing a mask). To a major extent, this estimate appears to reflect the government's success in spreading awareness of the pandemic. In the previous rounds, awareness about key COVID-19 symptoms ranged between 74%-76% and awareness about protective measures ranged between 85%-92%, indicating only a marginal increase in knowledge levels about COVID-19 between May and June.

Table 7: Health Indicators by State for Round 3

Indicator	Overall	Ra	UP	Bihar	Jharkhand	MP	AP
Avoided Healthcare	16%	10%	16%	22%	12%	19%	14%
Awareness of Symptoms	72%	70%	62%	75%	70%	72%	85%
Awareness of Prevention Methods	82%	79%	78%	84%	83%	84%	89%

3.7 Integrated Survey and Administrative Data

This section presents results from leveraging the common geographic frame of the survey design with India's largest open-access geo-coded multidimensional database at the village and town level.

It is evident that while the unemployment rate has recovered as of September 2020 across, the recovery has been greater in villages that are relatively closer to urban areas. The

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[25] This section was only administered to one-thirds of the sample comprising Rajasthan and Jharkhand households for Round 1 and Round 2. For Round 3, the scope was expanded to include all the six surveyed states. The results across the three rounds are discussed for Rajasthan and Jharkhand to ensure comparability.

importance of urban access in the post-pandemic economic recovery is illustrated in Graph 9.

Graph 9: Distance to Nearest Town, and Unemployment Recovery
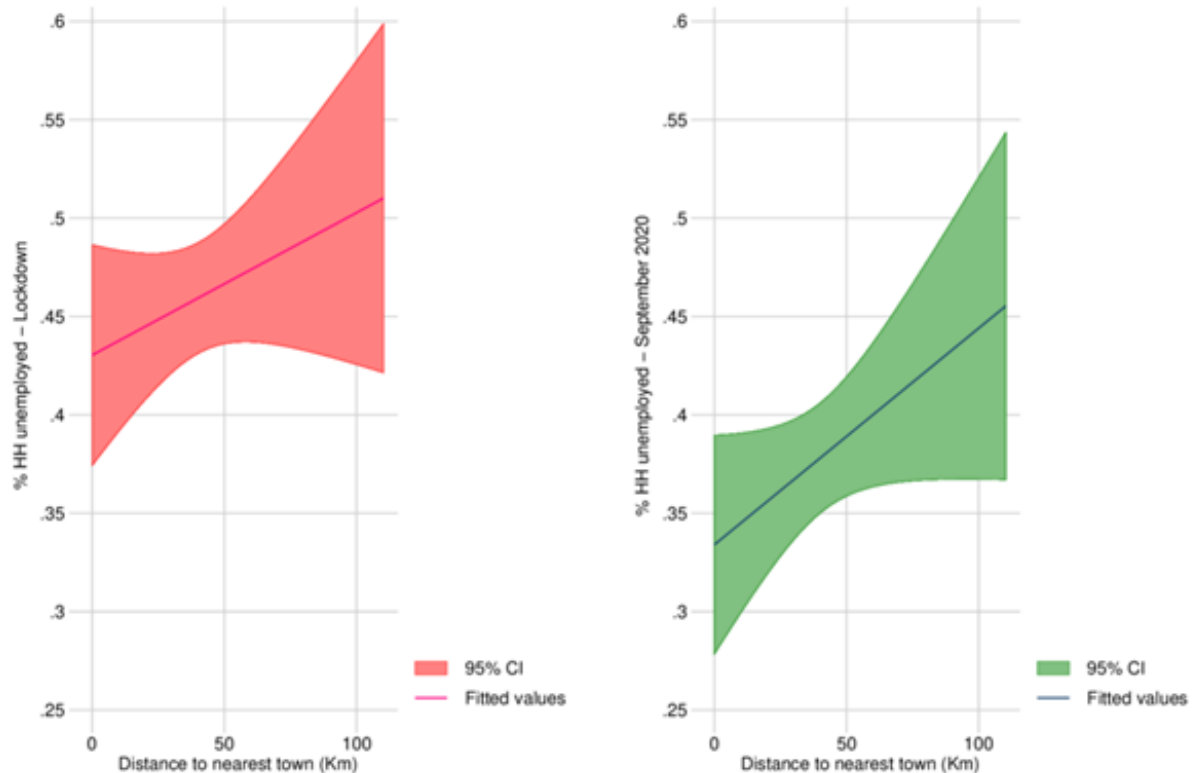
Villages with a higher poverty rate have a higher proportion of households that continue to show signs of food insecurity linked to the pandemic. The results of this analysis using the poverty rate recorded in the 2011 round of the socio-economic caste census is shown in Graph 10.

Graph 10: Persistence of Food Insecurity After the Lockdown, and Baseline Poverty Rate

Note: The Y-axis shows % of HH in the village that became food insecure due to the pandemic and haven't recovered
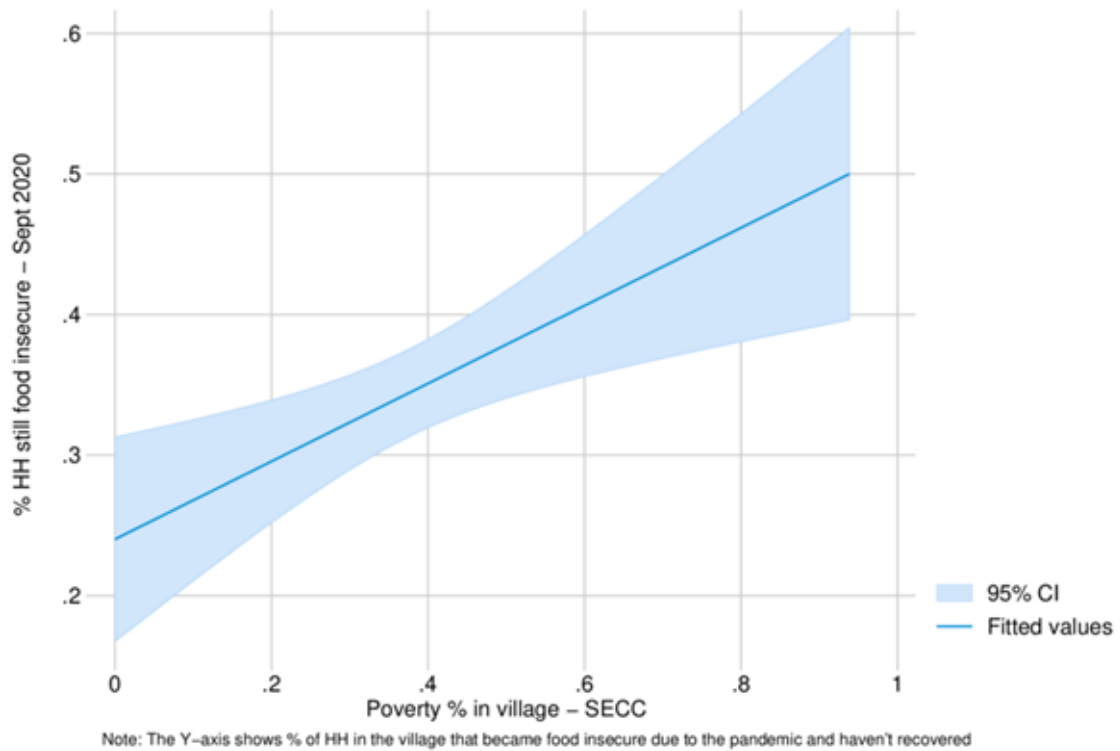
Besides, wages were slightly higher in poorer villages where respondents were able to access work under the MNREGA scheme (Graph 11). Notably, a 1% increase in baseline poverty rate is associated with a 0.4% increase in reported mean MNREGA wages received in a village.

Graph 11: Efficacy of MNREGA Wages in Targeting Poverty
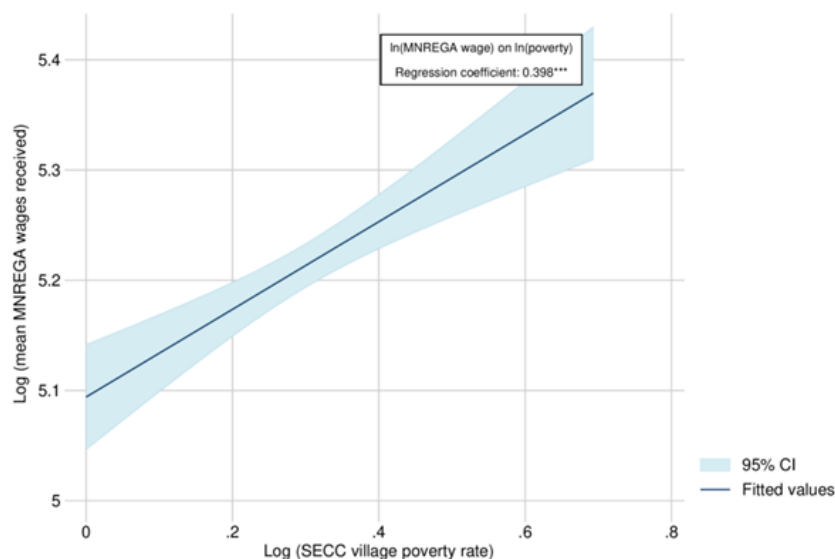
Moreover, the study found that optimism in the agriculture sector is inversely related with the degree of landlessness in a respondent's village (Graph 12). As of September 2020, the results indicated that farmers residing in villages with a higher incidence of land ownership are more likely to have a more positive harvest outlook than what they had last year.

Graph 12: Optimism in the Agriculture Sector and Landlessness

Harvest outlook on landless share
Regression coefficient: −.185***

95% CI
Fitted values

% of farmers with a +ve harvest outlook this year vs. last year

Census: Share of landless working age population (18–65)
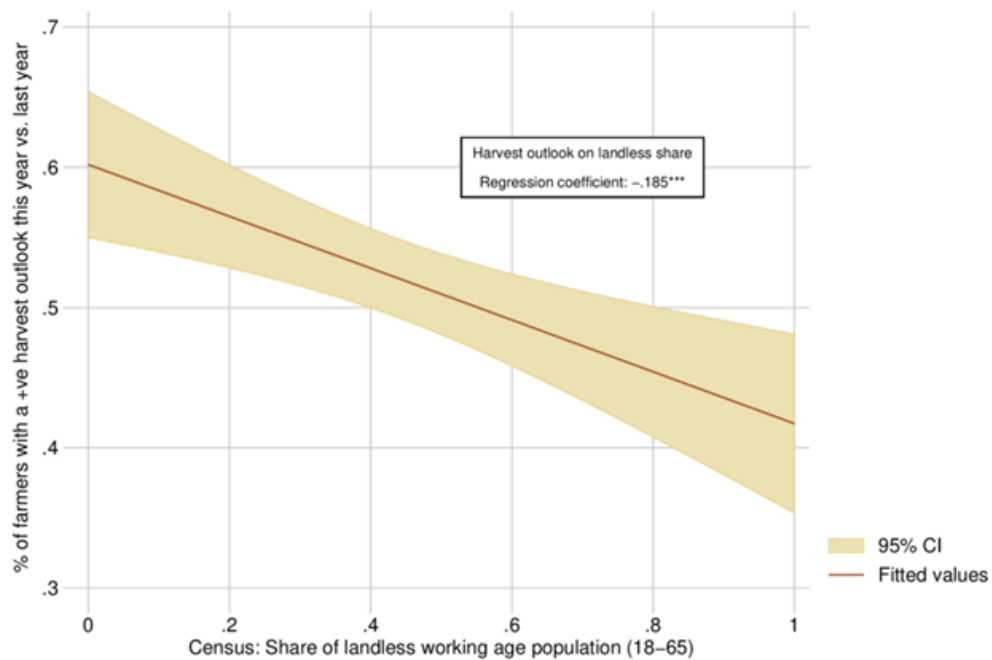
CONCLUSION

There is no doubt that effects of COVID-19 will continue to constrain India's rural economy in the short to medium term, with labour force participation, wages and consumption in September 2020 persisting below pre-lockdown levels earlier in that year. In this context, the near-universal provision of relief points to the critical role played by Government of India in mitigating the effects of the pandemic, while facilitating a gradual economic recovery.

The agriculture sector has shown resilience despite the many challenges of the pandemic, including supply chain disruptions and mobility restrictions that impacted labour and input availability. With schemes like PM KISAN poised to spur growth in investment and expenditure in agriculture, the government has the opportunity and platform to introduce similar policy instruments to effectively target relief and accelerate growth in rural communities. There is also need for interventions that support climate-resilient and resource-efficient food systems.

The pandemic has also demonstrated the strength of India's growing Self-Help Group network (supported by MoRD under DAY-NRLM) in providing its members better access to relief and government welfare programmes. As India continues to deal with the fallout of the pandemic and a contracting economy, this network is likely to be leveraged in the future to improve the efficiency and service delivery of government programmes..

The importance of these safety nets is especially pertinent in light of the persistent distress faced by India's reverse migrants, who are struggling to find work in their villages and do not have access to the same level of social protection as other rural residents. In such an employment environment, migrant-specific programmes like the Garib Kalyan Rozgar Abhiyaan, have the potential to substantially address the unmet needs of this population. Non-farm rural development is also a critical complementary agenda with the potential to generate alternate livelihoods and overcome labour market pressures in rural economies.

The pandemic has demonstrated the need to invest in new technologies and methods of data collection. While phone surveys have proven to be invaluable in providing data on a rapidly evolving situation, their results must be interpreted carefully given the differences between phone-owners/responders and non-owners/non-respondents—and their responses. Alongside innovations in rapid data collection, there is need for concerted efforts to strengthen government administrative data systems and capacity to be able to support evidence-informed, rapid policy response.

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APPENDIX

Appendix 1: Self-Help Group Disaggregated Analysis

Note: This sample was intended to be representative of the rural population as a whole, and was not designed to specifically capture Self-Help Group membership. As such, these findings provide directionally relevant information, but do not provide an exhaustive picture of the experiences of SHGs during the pandemic.

Sample Description

- Approximately **42% of the sample reported self-help group membership**, with high membership in Bihar (50%), Uttar Pradesh (51%) and Andhra Pradesh (53%).

- 57% of households with SHG membership reported cultivation land as their primary occupation. Out of the remaining SHG households, 22% reported working as daily wage labourers in non-agricultural sectors followed by 15% that worked as daily wage labourers in agriculture.

Relief

- **SHG members seeking MGNREGA work are more likely to receive it than non-members.** The gap between the two groups was 10% in July 2020 and 7% in September 2020.

- **SHG members are more likely to receive free and subsidised grain from PDS stores than non-members.** The difference between the two groups was 4% in July and and 6% in September.

- On an average, **SHG households reported receiving 20 kg of free wheat** from PDS shops in June, approximately 3 kg lesser than the quantity of wheat received from PDS shops by non-SHG households. This gap narrowed to only 0.8 kg in September.

- While SHG members were **11%** more likely to receive cash transfers from the government in July, there was **no significant difference[26]** between SHG and non-SHG households receiving monetary relief from the government in September.

- **The primary source for withdrawing money for both SHG and non-SHG households was ATM/ Bank branches followed by Bank Mitras/Sakhis**. More than 35% of SHG

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[26] Significance was determined using the *lincomest* command in STATA, that estimates the significance of a linear combination of model coefficients.

households and 41% of non-SHG households reported using Bank Mitras/Sakhis for withdrawals in June.[27]

Food Insecurity

- SHG households were **more likely to report reduction in meals** than non-SHG households. This gap was greatest during the lockdown in July **(5%)**, but reduced to <2% by September.

Percentage of respondents reducing meal size
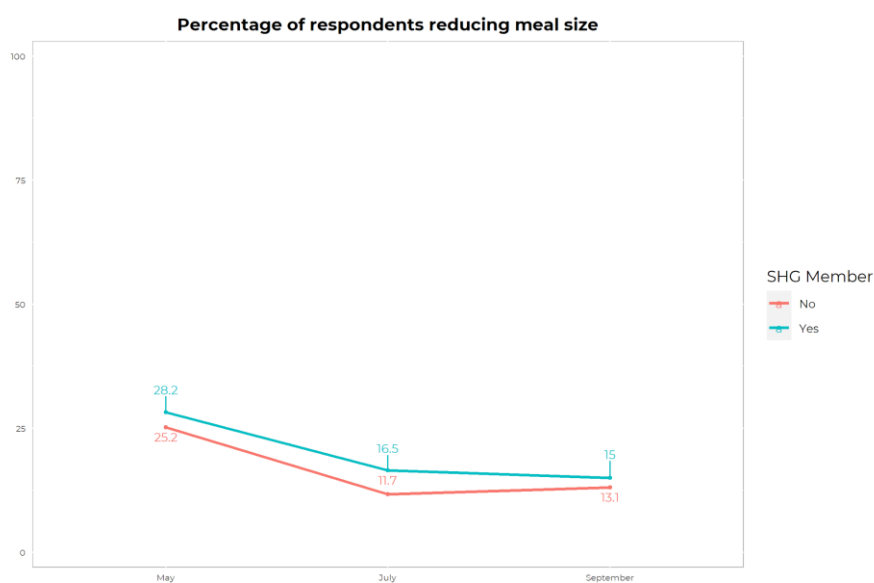
- This differential points to acute vulnerability of SHG households, suggesting that SHG-specific interventions like the Food Security Fund can improve the targeting efficiency of food security programmes.

- Among all states, a SHG member household in **Bihar had a 35% chance of showing food insecurity in July** compared with a 28% chance for a non-SHG member household from Bihar. This was the highest among all the 6 states surveyed, indicating Bihar's severe food insecurity incidence, and the compounded effect of the Kosi floods in July.

Agriculture

- There were no significant differences in acreage, agricultural borrowings, or fertiliser expenditure between SHG and non-SHG households.

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[27] ≈4% of all households reported withdrawing the money received from the government with the help of Bank Sakhis. There is no significant difference between SHG and non-SHG households in using this medium for withdrawing money in June.

COVID Response Efforts

- Almost 42% of the respondents in September reported that SHGs in their village were not involved in any activity since the lockdown.

- Among households with active SHGs in their villages, the proportion of households receiving COVID-19-related support from SHGs rose from **34%** in July 2020 to **69%** in September 2020.

- Only 1.5% and 0.6% of SHG households reported taking economic loans and consumption loans respectively from SHGs in the month of June 2020. This increased to 2% for both types of loans in September.

Appendix 2: Fertiliser Analysis

The survey data shows that the average farmer reduced fertiliser expenditure by 13% over that of last year's Kharif season. Overall, 57% of households reported reducing their fertiliser expenditure, with 20% reporting increases and 22% stating no change. Across states, Andhra Pradesh (-37%) reports the largest average fall in fertiliser expenditure, while the decline is at its lowest in Uttar Pradesh (-7%).

Factors driving changes in fertiliser expenditure

1. **Acreage:** On an average, farmers in the sample reported a **3% increase** in area under cultivation over that of last year's Kharif season. Controlling for state fixed effects, price and application covariates, a **1% increase in acreage** is associated with a **~0.53% increase in fertiliser expenditur**e.

% change in fertiliser expenditure, by change in acreage
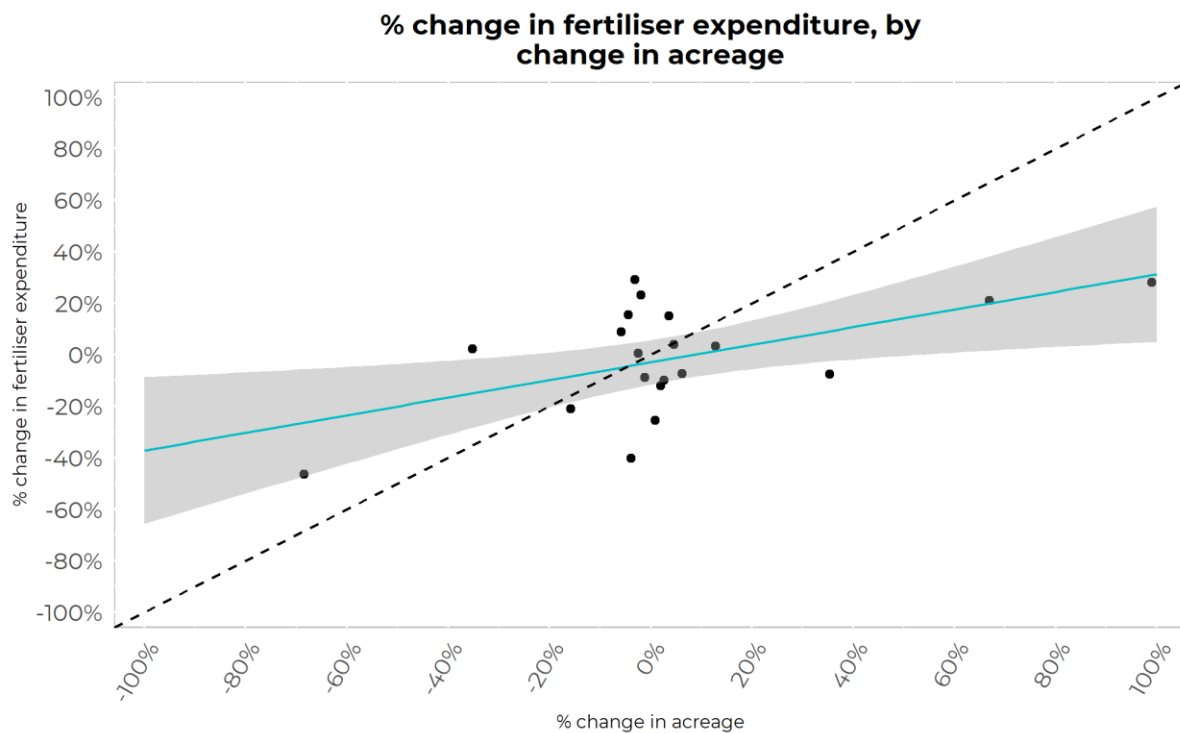
2. **Price rise and differential elasticities:** While 35% of farmers reported increases in the prices of fertilisers, 57% of farmers reported no change in their per-unit application of all fertilisers. Among farmers who reported price rises, 19% reported reducing their expenditure, while among farmers who reported no price rise, 29% of farmers reported reducing their expenditure.

Price Change	Expenditure increased	Expenditure did not change	Expenditure decreased	Sample Size
All prices rose	25%	56%	19%	702
No prices changed	20%	51%	29%	439
Overall	20%	58%	22%	2175

Note that the first two rows don't sum up to the total as some farmers reported differential changes across fertilisers, including price falls.

Despite the seemingly price inelastic nature of fertiliser demand, significant variation in price elasticity can be seen along two dimensions: farmer's scale of operations and crop categories.

- **Scale of operations:** Using fertiliser expenditure in 2019 as a proxy for farmer's scale of operations, farmers with smaller scales of operation differ considerably from larger farmers. On an average, farmers who were in the bottom quintile of scale (spending ~Rs.1100 on fertilisers in Kharif 2019) reported a **33% increase** in fertiliser expenditure this year. The size of this increase steeply declines as one moves up scale of operation quintiles, culminating in a **43% decline** in fertiliser expenditure for farmers in the top quintile of scale (spending ~Rs.54,436 on fertilisers in Kharif 2019). Among those reporting price rises, irrespective of changes in acreage, farmers in the top quintile reduced their fertiliser expenditure relatively more than farmers in the bottom quintile.
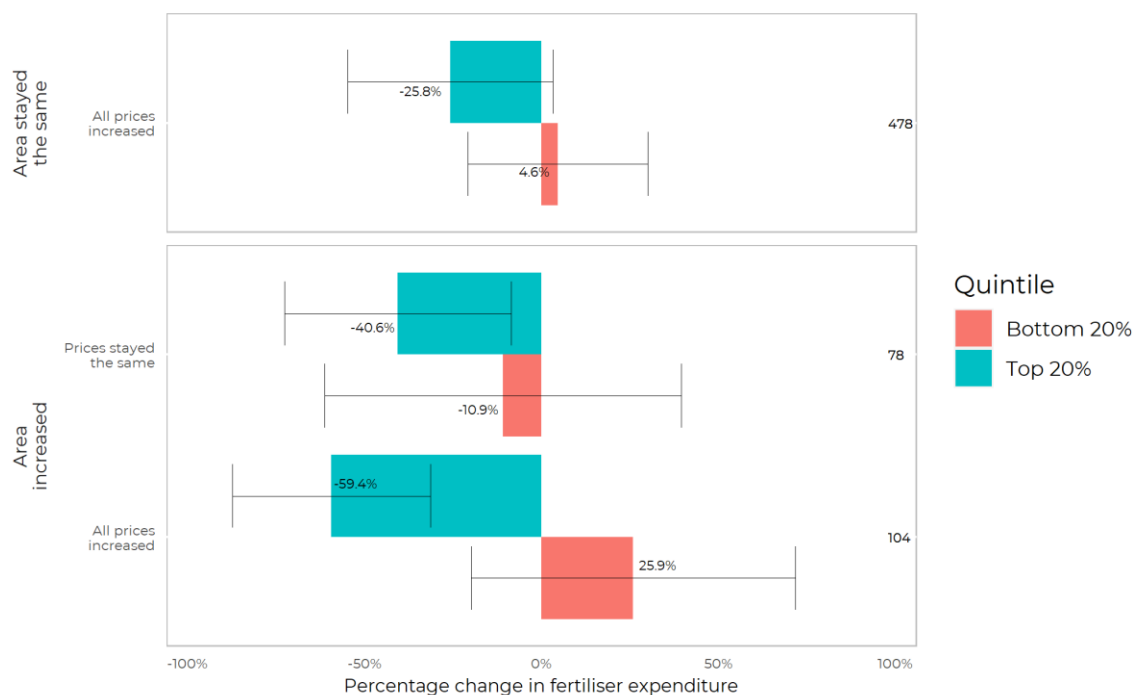
- **Crop categories:** There is evidence that fertiliser demand is particularly price inelastic for cereal farmers. Analysis of Cost of Cultivation data from 2007 to 2013 suggested that the price elasticity of fertiliser demand for paddy and wheat farmers was -0.03 and -0.15 for maize farmers (Kishore, 2018). This is also borne out in the data, which shows that **perishables farmers** report **reducing their fertiliser expenditure** by an average of **41%**, compared with a **decrease of 11% by cereal farmers**. Furthermore, in the sample, 14% of farmers in the top quintile report growing perishables as their primary crop, compared with less than 1% of farmers in the bottom quintile.

The survey examined fertiliser trends along two additional dimensions:

1. **Changes in per-unit expenditure, by state:** The survey team constructed a per-unit measurement indicator to assess the consistency of responses when respondents were asked if they had reduced their per-unit fertiliser expenditure. Given the heterogeneity in land units across states and the unavailability of unit conversion data, the team reported these per-unit estimates at the state level, with the assumption that unit definitions are consistent across states.

Note: the label on the right is the per unit percentage change from 2019 to 2020
Highlighted points have a confidence interval of less than Rs.1000
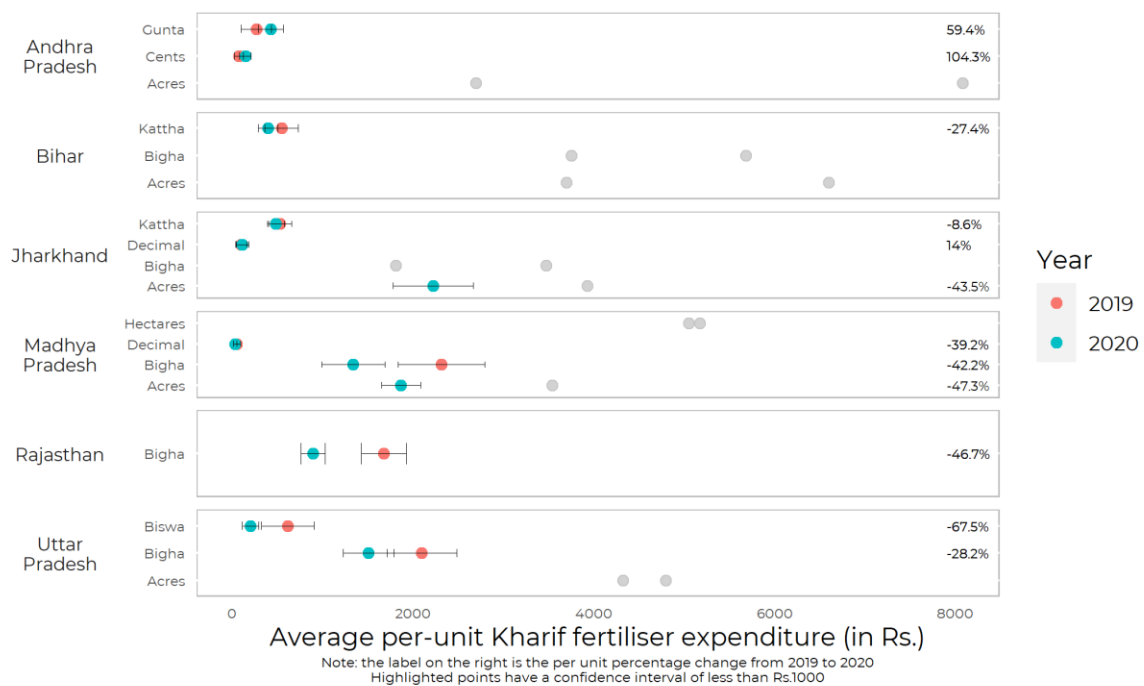
The survey found that, on aggregate, there is a decline in average per-unit fertiliser expenditure between Kharif 2019 and Kharif 2020 across all states and units. In contrast, when explicitly asked, **57%** of farmers reported no change in their per-unit application of all fertilisers. Connecting these two estimates, the survey observed that **only 34% of farmers were directionally consistent across both indicators** (that is, when both the explicit indicator and constructed indicator show either a decrease, an increase or no change in per-unit fertiliser expenditure).

2. **Assessing changes in expenditure among farmers exclusively surveyed in September:** For the September round, the survey team contacted the respondents it had contacted in July, as well as new respondents. The team prompted the previously-surveyed respondents about their July estimate of fertiliser expenditure incurred during Kharif sowing, and asked them if they would like to update this number to reflect subsequent purchases made between July and September. In the process, the team presumed that the framing of questions may have introduced measurement error through misinterpretation and anchoring effects.

Text of the pertinent questions in the September questionnaire

Respondent Type	Question Text
Repeat respondent	*In July, you told us that you spent Rs XX on fertilisers across all crops during sowing in this monsoon season. Is this correct?* *If not, across all crops, how much did you spend on fertilisers in this monsoon season?*
New respondent	*Across all crops, how much did you spend on fertilisers in this monsoon season?*

To examine this, the survey team disaggregated the average change in fertiliser expenditure reported by respondents surveyed exclusively in September, and those surveyed in both September and July. The team found that respondents surveyed exclusively in September reported a 1% decrease in fertiliser expenditure, while farmers surveyed in both July and September reported a 18% decrease—a significant difference.

Both these analyses point to two potential sources of measurement error: (i) **recall bias** and (ii) **anchoring bias.**

(i) **Recall bias:** There is evidence that **farmers report greater quantities of harvest, labour, and fertiliser inputs when asked to recall over long periods of time. Research suggests that each additional month of recall inflates quantities by 2-5%.**[28] The survey team believes this effect may have caused farmers to overestimate their fertiliser expenditure in 2019, inflating the difference between this year's and last year's Kharif. The inconsistency in the explicit and per-unit expenditure indicators also supports this hypothesis, as it suggests that farmers were more likely to report higher fertiliser expenditure in 2019 when asked quantitatively than qualitatively.

(ii) **Anchoring bias:** There is evidence suggesting that **there are sizable anchoring effects in self-reported recall data among smallholder farmers.**[29] As discussed above, the survey reminded a subset of farmers of their July 2020 responses while

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[28] Wollburg et al. (2020), *Recall Length and Measurement Error in Agricultural Surveys,* World Bank Policy Research Working Papers, https://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-9128

[29] Godlonton, S., Hernandez, M.A. and Murphy, M. (2018), *Anchoring Bias in Recall Data: Evidence from Central America*. American Journal of Agricultural Economics, 100: 479-501. https://doi.org/10.1093/ajae/aax080

asking about Kharif expenditure in September. The survey team believes that this prompt may have anchored farmers to their July estimates, which may have only reflected the costs incurred during the sowing season. Indeed, **86%** of farmers reported no change in expenditure from July to September. It is possible these farmers may have underestimated their overall Kharif 2020 fertiliser expenditure. This is supported by the fact that farmers who were reminded of their July estimates reported a **~18%** year-on-year decrease in fertiliser expenditure, compared with a **1%** year-on-year decrease reported by farmers not reminded of their July expenses.

Thus, the survey hypothesises that the **overestimation of Kharif 2019 expenditure (induced by recall bias),** and the **underestimation of Kharif 2020 expenditure (induced by anchoring bias)** may have **inflated the size of the decline in fertiliser expenditure** reported in the sample**.**

Type of Respondent	Average % Change in Land Cultivated	Average % Change in Fertiliser Spending	Average % Change in Agricultural Borrowings
July + September *(reminded of past answer)*	+3.1%	-18%	-13.7%
September *(not reminded of past answer)*	+3.7%	-0.9%	-2.4%

Appendix 3: Sampling Frame Details

The phone numbers used in this survey were assembled from four prior IDinsight projects, and from an impact evaluation of the National Rural Livelihoods Mission conducted by the Ministry of Rural Development. Each of these surveys sought to represent distinct populations, and employed unique sample designs and weighting schemes. Key features of each dataset are summarised below:

Name	Description	Population of Interest	Year	Frame	Stratified and Clustered?	Weighted?
Poshan Abhiyaan Monitoring	Two-stage stratified cluster random sample. Seven districts in Rajasthan and five districts in Jharkhand were randomly chosen from strata designed to capture relevant heterogeneity within each state. Within each district, 35 polling stations were selected with probability proportional to size (PPS) from assembly constituency (AC) strata, and then 15 households were chosen from each polling station.	Full rural populations of Rajasthan & Jharkhand	2019	Voter rolls	**Stratified:** At the AC level **Clustering:** at the polling station (primary sampling unit) level	Probability weights defined for original sample
Poshan Abhiyan SBCC Monitoring	Two-stage stratified cluster random sample. In Andhra Pradesh 200 villages/wards were chosen with probability proportional to size from strata defined by a range of socio-economic indicators. Six households were then chosen from the registry of a frontline worker whose catchment covered the selected village/ward.	All households in Andhra Pradesh with pregnant or lactating mother listed by a frontline worker	2018	Frontline worker registries	**Clustered:** at the village/ward (primary sampling unit) level	Probability weights defined for original sample
State of Aadhaar Report	Three-stage stratified cluster random sample. Three districts in Andhra Pradesh were randomly chosen with PPS. Within each district, 20 polling stations were selected with probability proportional to size (PPS) from assembly constituency (AC) strata ,	Rural households in Andhra Pradesh	2018	Voter rolls	**Clustered:** at the polling station (primary sampling unit) level	Probability weights defined for original sample

	and then 10 households were chosen from each polling station.						
National Rural Livelihoods Mission	Sample was collected by DAY-NRLM and covered 9 states that were part of the National Rural Livelihoods Mission. Number of households sampled were 2398 in UP, 4524 in Bihar and 2877 in Madhya Pradesh.	Representative of SHG membership in states. Rural districts selected from strata to reflect a range of outcomes.	2019	Village listings	**Clustered:** at the village (primary sampling unit) level	Not defined in the original survey
Soil Health Card	Within UP, the survey team selected 4 districts that represent literacy and mobile phone penetration heterogeneity, as well as agro-climatic variation. The team then selected 24 villages from each district, and approximately 20 farmers per village. The farmers were then selected by a random walk using WHO Extended Programme on Immunization (EPI) protocol.	Representative of farmers in UP	2019	SHC database, random walk of an area frame	**Clustered:** at the village (primary sampling unit) level	Undefined (final stage was not a probability sample), but assumed to be approximately self-weighting.

Round #	Survey	Rajasthan	Jharkhand	Andhra Pradesh	Uttar Pradesh	Bihar	Madhya Pradesh
1	Completes	1790	1174	481	710	207	214
	Attempts	2941	2014	1026	1450	447	443
2	Completes	930	890	511	778	1073	823
	Attempts	1500	1500	1005	1899	2658	2339
3	Completes	1078	995	395	757	1,030	944
	Attempts	2756	2003	947	1899	2658	2337

Appendix 4: Analytical Challenges

The above features of the sample impose limits on the inferences that the survey team can draw and imply analytic challenges.

1. *Representativeness*: For each state, the sample is not necessarily formally representative of the full state population. Of the six states, only **Rajasthan and Jharkhand** are represented by an (arguably) unbiased sample for the full rural population. **Andhra Pradesh** is covered partially by a representative sample (SOAR), but that sample is pooled with an non-representative one (SBCC). **Bihar, Madhya Pradesh, and Uttar Pradesh** are covered by the NRLP sample, which captures data from rural districts where the programme was implemented. These districts may have had less favorable outcomes *ex ante*, but in some instances outcomes may be improved due to the prevalence of SHGs.

    The representativeness problem is compounded when the data is pooled for cross-state analysis. Three main problems arise. First, the pooled sample is not representative of any population in particular, but rather it inherits the biases of each state sample, and represents some generalized, amorphous rural population. Second, most states in the sample have roughly equal final sample sizes, but the states vary widely in total population. Each state's observations should be reweighted to reflect the imbalance. Finally, the absence of a unified sampling strategy, and therefore incompatible probability/sample weight, make it difficult to analyse the data as a whole.

2. *Non-coverage*: The sample frame comprises households with mobile phones. Phone owners may differ from non-phone owners in ways (socio-economic status, SC/ST status, remoteness of a village) that are correlated with outcomes of interest.

3. *Non-response*: Similarly, non-respondents may differ systematically from respondents. To the extent that non-response is correlated with outcomes of interest, estimates may be biased. Non-response also decreases precision by reducing the sample size.

Re-weighting to Reduce Bias

The survey team attempts to address the analytical challenges listed above by re-weighting observations to the extent that these and ancillary data sources allow. Two main approaches were used. To account for biases that may have been introduced by non-coverage of the various frames and non-response to the survey, the team rescaled the weights at the district level using a ***class adjustment*** where the classes are defined by socio-economic variables, which are typically a combination of caste and either income or a poverty index. To account

for potential biases within states and to correct the population imbalance for the pooled analysis, the team ***post-stratified*** to state totals for caste and religion.

The basic weighting steps (state-wise) are these:

1. Rescale base weights for non-coverage and selection into the phone sample
    a. **Base weights**: Base weights reflect a probability of selection into the original sample, and can be interpreted as an expansion factor to some population. State-wise details follow:
        i. *Bihar, Madhya Pradesh, Uttar Pradesh*: As noted above, probability weights are not included in the NRLP sample. Even base weights were assigned.
        ii. *Andhra Pradesh*: The source datasets provide base weights, which expand to the state population (SOAR) or the population of households listed on ASHA/AWW rosters (SBCC).
        iii. *Jharkhand, Rajasthan*: The source dataset provides base weights, which expand to full district populations. These districts were chosen with PPS from geographic strata to represent the rural population of the two states.
    b. **Non-coverage**: Next, create *weighting classes* within *districts* based on socio-economic covariates known from the master sample. Within these weighting classes sum the base weights (1.a.), and divide this into the sum of the weights for "covered" households (i.e. those with a mobile phone). Next, multiply the weights from (1.a.) by the inverse of these proportions. State-wise details follow:
        i. *Bihar, Madhya Pradesh, Uttar Pradesh*: The weighting classes were defined by two categorical variables from the NRLP data: caste (SCST/OBC/General) and household income (five quintiles).
        ii. *Andhra Pradesh*: The team defined weight classes by caste (SCST/OBC/General), and PPI quintile (if the household is from the SBCC sample) or ration card status (if the household is from the SOAR sample).
        iii. *Jharkhand, Rajasthan*: Unfortunately weighting class adjustments are not possible in these states due to insufficient covariate data.

    c. **Selection:** In certain states (Bihar, Jharkhand, Rajasthan) a subset of the covered households was randomly selected. In these cases, the weight from (1.b.) was adjusted by the probability of selection.

2. Rescale the weights from step 1 to account for non-response
    a. **Non-response:** The correction for non-response also employs weighting classes, and follows the steps from (1.b.) exactly. Non-response adjustments are applied to the output of step (1.c.).

3. Post-stratify the weights from step 2

    a. **Process:** *Post-stratification* attempts to correct for known differences between a sample and a target population. The process entails adjusting the sample weights such that their sum within each post-stratum equals the known population total for that post-stratum. Specifically, the *raking to margins* method was used, which recursively recalibrates weights to marginal totals of the chosen post-stratification covariates until the weights converge.

    b. **Data:** Post-strata for SC/ST status and religion were defined using population totals (household level) for caste and religion from the 2011 population census.

Note that despite taking care to generate theoretically correct sample weights, they seem to make little difference in application. Weighted point estimates typically fall within 1-2 percentage points of unweighted estimates, and deviances from weighted to unweighted estimates rarely exceed 3 percentage points. This suggests that outcomes tend to be uncorrelated with variables used in the weighting adjustments. Other, unavailable (but unbalanced) covariates may be correlated with outcomes of interest. Unfortunately, the survey team was constrained by variables that occur in the source data or other publicly available ancillary sources. For these reasons, the user should interpret these statistics carefully, especially when comparing across states.

Estimation

All estimates reported here were generated in Stata 15, and account for stratification, weights, and clustering using svyset commands.