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Digital Food Assistance in India

Marginalising the marginalised



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List of acronyms

AAY: Antyodaya Anna Yojana

AePDS: Aadhaar-enabled Public Distribution System

APL: above poverty line

BPL: below poverty line

CGSWC: Chhattisgarh State Warehouse Corporation

CSC: Common Services Centre

CSP: Customer Service Point

DBT: Direct Benefit Transfer

DCP: Decentralised Procurement System

DG: Digital Green

e-KYC: electronic know your customer

ePOS: Electronic Point of Sale

FAO: Food and Agricultural Organization

FCI: Food Corporation of India

FGD: focus-group discussion

FPS: Fair Price Shop

HH: household

HLC: High-Level Committee

IDEA: India Digital Ecosystem of Agriculture

IMPDS: Integrated Management of Public Distribution System

INR: Indian Rupee

JAM: Jan Dhan, Aadhaar, and Mobile

KCC: Kisan Credit Card

MARKFED: Marketing Federation

MLA: Member of the Legislative Assembly

MLE: Mandal Level Entrepreneur

MoU: Memorandum of Understanding

MSP: Minimum Support Price
NAN: Nagrik Aapurti Nigam/ Civil Supplies Corporation
NFSA: National Food Security Act
ONORC: One Nation, One Ration Card
OTP: one-time password
PDS: Public Distribution System
PHH: Priority Households
PMGKAY: Pradhan Mantri Garib Kalyan Anna Yojana
PVTG: Particularly Vulnerable Tribal Group
PPP: public–private partnership
TPDS: Targeted Public Distribution System
UFID: Unique Farmer Identification Number
UIDAI: Unique Identification Authority of India
WEF: World Economic Forum

Some of the relevant social welfare schemes for the poor and marginal/small farmers.

Atal Pension Yojana: Contributory old age pension scheme

Pradhan Mantri Garib Kalyan Ann Yojana: Prime Minister's food grain scheme for the welfare of the poor

Pradhan Mantri Jan Dhan Yojana: Prime Minister's people's wealth scheme (Public finance scheme)

Pradhan Mantri Jeevan Jyoti Bima Yojana: Prime Minister's life insurance scheme

Pradhan Mantri Kisan Samman Yojana: Prime Minister's farmers' tribute fund

Pradhan Mantri Suraksha Bima Yojana: Prime Minister's personal accident insurance scheme

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Cover credit: Gayatri, illustratinghope@gmail.com

The illustration is in honour of the Manjhi tribal people many of whom cannot access care because their fingerprints are worn out or because they were away collecting Mahua (*Madhuca longifolia*) flowers during enrolment. Reliance on biometric verification has transformed a tool of inclusion into a barrier to nutrition, health and social protection services. (First exhibited at the *Bringing Evidence in Public Health* conference, 2026, Institute of Public Health, Bengaluru, as part of an interactive exhibition entitled ‘Politics of Evidence’).

Executive summary

India's historical experience with food scarcity, famines and inadequate production during the colonial period has made food security a key concern. In post-independence India, food security was adopted as a social policy in the planning of the state, which played a major role in the country's economy. From 2010 onwards the country began to transition towards a digital welfare state, as several of the social welfare programmes, including food security programmes, were digitalised. The promise was that digitalisation would reduce corruption and increase the efficiency of government programmes, improve access to government and banking services, reduce the urban–rural divide, boost economic growth and create employment opportunities.

This working paper (Working Paper II) is part of an ESRC-funded project on the 'Digitalisation of Food Assistance: Political economy, governance and food security effects across the global North–South divide'. The study aims to understand how the digitalisation of food assistance has influenced vulnerability to food insecurity, and its role as a source of power and way of governing. This working paper presents findings in the second, in-depth phase of the research in India, with fieldwork carried out throughout 2025 and part of 2026.

In this study, we use a broad definition of food assistance that includes 'food subsidies, strategic grain reserves, and social protection or longer-term social welfare programmes of both cash and in-kind transfers' (Jaspars and Sathyamala, 2021: 5). Given that food subsidies and grain reserves are integral to agricultural policies, the Indian case study examines the digitalisation of agriculture sector and its consequences for food security of both the producer and consumer from marginal households. In that sense we include food production and food procurement, along with food distribution, as a welfare measure in our definition of food assistance and examine how digitalisation is transforming them.

Data collected were primarily qualitative with some elements of quantification. As described in Working Paper I, the study is located in two states, Delhi and Chhattisgarh chosen to reflect the two ends of the spectrum in terms of development, particularly infrastructure, which includes that pertaining to digitalisation. Data was collected from two field sites (rural and urban) in Delhi and four field sites (three rural and one urban) in Chhattisgarh. The study employed a two-stage mixed-method research

design with both questionnaire-based data collection and in-depth interviews of purposively selected respondents. These were supplemented by direct observations, key informant interviews, and secondary literature review. In addition to this a special case study on the Saagu Baagu project in Telangana state was included. Data for this was collected by a two-day field visit supplemented by secondary literature.

The empirical data are presented in chapters 3, 4, 5 and 6. Chapter 3 describes the processes of procuring and storing grain for the Public Distribution System (PDS) from the field (*khet*) to the godowns and the embedding of digital technologies at various levels in the Chhattisgarh field site. The introduction of digitalisation in the form of the unique farmer ID (UFID) for procurement of grains from the farmers has meant the forcible registration of their land in AgriStack whether they access the mandi (market) or not. It raises the question of why so much effort is being put into registering every single piece of land, however small, and whether this mapping exercise is to make visible what has been largely invisible. Further, since the unique farmer ID recognises only those who own land and not the cultivator, it should be renamed as a ‘unique landowner ID’ rather than a ‘unique farmer ID’. Tribal areas pose a special problem in that farmers may be traditionally cultivating common land for generations without legal documents and hence will go unrecognised digitally speaking. Such farmers become non-existent or ‘ghost’ farmers because they are invisible to the digital eye.

Chapter 4 looks at the pathway to *pet* (stomach), that is, distribution of foodstuffs through the PDS and the role of digitalisation to examine how it has impacted the lives of the recipients and the functionaries in the system. Data showed clear regional and rural–urban differences. While access was not a major problem in Delhi urban site because of the large number of PDS shops, and because connectivity was not a major issue, in the Chhattisgarh sites (both rural and urban) digitalisation posed a serious problem. There was also an important difference between the two areas which related to quantity and quality of the rations. There were many complaints regarding this in the Delhi sites (both rural and urban) whereas hardly any in the Chhattisgarh sites. The implication is that in Delhi area, there is continued ‘leakage’, despite digitalisation working quite well. The major reason for this could be that all the Delhi ration shops were privately owned, with little community control or supervision. In the case of Chhattisgarh, ownership was with the local community-owned bodies, such as women’s self-help groups, which indicated a mechanism of accountability that functioned.

Thus, it could be concluded that digitalisation on its own may not lead to better accountability or prevent leakages.

Chapter 5 examined the introduction of digital technology in agriculture. In WP-I we showed that the small and marginal farmers in Chhattisgarh field sites had not adopted any of the smart and precision technologies in agriculture. Therefore the Saagu Baagu project in Telangana state was studied, and the findings are presented as a case study. During its Phase 1, Saagu Baagu was celebrated internationally as a success story in increasing incomes of small and marginal farmers engaged in chilli cultivation. However, the plans to scale up in Phase 2 did not materialise. Field-level interaction confirmed that there was an increase in income from chilli farming in the first phase. However, it was short lived, particularly due to the emergence of several types of pests, which caused huge devastation, with farmers incurring heavy losses and shifting to growing cotton or maize. The findings suggest that digital agriculture interventions cannot be based on short-term pilot formats because agricultural risks unfold over multiple seasons. Moreover, for smallholders, institutional support is critical for online trading which appeared to be a major reason for the increase in incomes.

Chapter 6 examines the operationalisation of the JAM (Jan Dhan, Aadhaar, Mobile) trinity, which is the scaffolding on which digital India rests. It provides the base for the Jan Dhan Yojana, which is a financial inclusion scheme for the poor, and provides financial services such as a basic savings and deposit accounts, remittance, credit, insurance, pension in an affordable manner. However, our study shows that while Aadhaar enrolment has been a ‘success’, and also the opening of bank accounts, with wide penetration of mobile telephones into remote rural areas, this has not led to much improvement in people’s economic status. The bank accounts act as mere conduits for the transfer of money from the government for its various Direct Benefit Transfer (DBT) schemes to the beneficiaries. With precarious households always running on a deficit budget, transfers are immediately withdrawn and spent on household needs, mostly food. Among the three arms of the JAM trinity, the role of mobile phones appears most questionable. With unstable connectivity, both in terms of electricity and internet, the rural–urban and regional divide was quite stark. Chapter 7 summarises the key findings and the overall conclusions.

1.

INTRODUCTION

In the early postcolonial period, India was a food deficit country dependent on international food aid, but in the past three decades it has transitioned into a self-sufficient food-producing country (United Nations, n.d.). It is now a net exporter of agricultural products (Ministry of Agriculture & Farmers Welfare, 2023). India has several social policies that deal with food security issues, one of them being the Public Distribution System (PDS), touted to be the largest food security programme in the world. Despite this, it has a high prevalence of undernutrition with 31.8% of children under the age of five underweight as per the National Family Health Survey 6 (2023–24), which was only marginally better than the previous survey in 2019–21 (Ministry of Health and Family Welfare, 2026).

From 2010 onwards the country began transitioning towards a digital welfare state, as several of the social welfare programmes, including food security programmes, were digitalised. The promise was that digitalisation would reduce corruption and increase the efficiency of government programmes, improve access to government and banking services, reduce the urban–rural divide, boost economic growth and create employment opportunities. To give a further boost to digitalisation, on 1 January 2013, the Indian government launched the Direct Benefit Transfer (DBT) scheme. The DBT was built on a digital platform linking bank accounts, unique identification numbers (the biometric Aadhaar) and mobile phone numbers (Sharma and Nair, 2016). The direct electronic transfer of money into the individual beneficiary’s bank account was allegedly meant to reduce delays in payments, allow for more accurate targeting of beneficiaries and curb leakages (Ministry of Finance, n.d.).

On 28 August 2014, the Pradhan Mantri Jan Dhan Yojana (Prime Minister’s People’s Wealth Scheme), a financial inclusion programme was launched. Popularly known as the JAM trinity, it rests on Jan Dhan (opening of a bank account), Aadhaar number and Mobile number and is meant to facilitate the DBT schemes. ‘Jan Dhan accounts receive the funds, Aadhaar ensures the right person gets it, [and] Mobile notifies and enables easy access to the money’ (Government of India, 2025a: n.p.).

The following year, the Indian government launched the ‘Digital India’ programme, with the intention of making the country a ‘digitally empowered society and knowledge-based economy’ (Invest India, 2024:

n.p.). This was to be ‘realised through three key pillars: robust digital infrastructure, accessible government services and empowered citizens’ (Invest India, 2024: n.p.). Currently there are 320 welfare schemes through 56 ministries, accessible only through the DBT.¹

This working paper is part of an ESRC-funded project on ‘Digitalising Food Assistance: Political economy, governance, and food security effects across the global North–South divide’. The project aims to understand how the digitalisation of food assistance has influenced vulnerability to food insecurity, its role as a source of power and way of governing, as well as its implications for addressing hunger, locally and globally. It includes case studies on Sudan and the UK as well as India. The main research questions are:

1. To what extent have food assistance and social welfare practices been digitalised and why? What are the key organisations, authorities and businesses involved?
2. How do digital practices interact with political and economic processes (linked to food) to influence inequality and power relations? How do they govern populations and influence their actions?
3. What are the implications of digitalising food assistance for the food security of marginalised populations?

This is the second working paper on the effect of digitalised food assistance in India.

1.1 Key findings from Phase I

Key findings from Phase I, presented in the first working paper (WP-I; Sathyamala and Laha, 2025), were largely exploratory as we focused on the first research question: identifying the range of digitalised practices. This included the genealogy of the Aadhaar biometric card that has become the lynchpin of digital India. Based largely on a literature review and interviews with high-level key informants, it demonstrated the link between state and capital. Since initially Aadhaar failed to attract registration as a voluntary scheme, a strategy of coercion was adopted and was first tested on the poor, a population categorised as below poverty line (BPL), by making Aadhaar mandatory for accessing PDS rations. Hence, for precarious, food-insecure households, acquiring an Aadhaar number and linking it to their ration cards

¹ See: <https://dbtbharat.gov.in/central-scheme/list>, accessed 30 June 2026.

became critical for combating hunger. The state took advantage of the powerlessness of a marginalised and poor BPL population to compel their registration and forcible inclusion in the digital Aadhaar system. Thus, in the context of hunger, in the absence of choice, forcible registration helped create a national database of digital citizenship.

WP-I also explored how digitalisation had affected the recipients of the PDS, the food assistance programme which provides subsidised foodstuffs to the needy, specifically designed to reduce food insecurity of those categorised as BPL. Based largely on secondary literature and some empirical evidence, it showed that while state officials and ration shop dealers experienced digitalisation as beneficial, the recipients found the process opaque and difficult to negotiate.

The third issue we examined in Phase I was the potential effects of digitalisation in agriculture on small and marginal farmers. Data from small and marginal farming households in Chhattisgarh state showed that none of them had adopted any of the digital practices in farming (smart or precision) that were being promoted. They were also unable to engage in online trading. Being a rain-fed area with a single yearly crop of paddy, the output of marginal farmers was so little that almost the entire crop was kept for self-consumption. In the case of small farmers who did have surplus output and did take their produce to the mandi (wholesale market), it was not large enough for them to engage in online trading on their own.

1.2 Outline of Working Paper II

This working paper (WP-II) focuses on the second and third research questions and is based on both secondary and empirical data collected in Phase II, specifically from the point of view and the experiences of the ‘beneficiaries’ of digitalised social welfare policies, with particular emphasis on PDS.

It begins with an overview of the methodology adopted in the study (Chapter 2). Chapter 3 examines the digitalisation of the PDS from grain procurement till the point of storage distribution. Chapter 4 examines the distribution of the PDS grain and includes the experiences and perception of both the ration shop dealers and the recipients’ (ration card holders). Chapter 5 looks at the deployment of smart and precision agriculture in study area. A special case study has been included on the Saagu Baagu project in the Khammam district in Telangana state, as this is the only case from India where digital technology was reported to have been of great

benefit to small and marginal farmers cultivating a chilli crop. Chapter 6 examines the operationalisation of the ‘JAM trinity’ at the ground level. Chapter 7 discusses the key findings and overall conclusions.

This working paper is for all those who are interested in food assistance and digitalisation, not only researchers but also policy analysts, activists and practitioners. The paper includes a first analysis of our findings, which will form the basis of discussions with different key stakeholders on policy implications, and more in-depth analysis on particular themes in journal articles. Our analysis of research findings in all three case studies will be published in a final report later in 2026.

2.

Methodology

2.1 Analytical framework

This research combines the concepts of ‘regimes of practices’, political economy, and food security from a structural or population-level perspective as well as that of the individual. In analysing ‘regimes of practices’, we identify the range of practices associated with digitalised food assistance, the underlying assumptions and ideologies, and the government authorities, organisations and businesses involved at the international, national and local levels. This enables us to analyse not only the intended functions of food assistance and its digitalisation but also what they actually do (Foucault, 2007; Schaffer, 1984). As such, we also look at digitalised food assistance as a form of governance, and we examine aspects of surveillance and ways in which assistance affects – or aims to influence – behaviour. This is combined with a political economy analysis of how food assistance can become part of processes of maintaining power for some and creating vulnerability to food insecurity in others (see, for example, (Duffield, 1994; Keen, 1994; Mkandawire, 2005). In examining the effects of digitalising food assistance on structural causes of food insecurity, we consider how political and economic processes (and ideologies), as well as inequalities in income, wealth and labour relations, contribute to food insecurity.

2.2 Definitions

There are several definitions of food security, food assistance, digital inclusion and exclusion, and digital poverty. The most common definition of food security is: ‘Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life’ (FAO, 1996). Food insecurity is the lack thereof. Food security is now usually measured by examining some aspects of household food consumption (see, for example, Maxwell et al., 2014).

Currently food assistance is defined in a variety of ways.² According to the Food and Agricultural Organization (FAO), food assistance is ‘all actions that national governments ... undertake to improve the nutritional well-

² The following paragraph is taken from WP-I (Sathyamala and Laha, 2025: 2–3).

being of their citizens, who otherwise would not have access to adequate food for a healthy and active life' (FAO, 1996: n.p.). The term 'food assistance' was coined as an alternative to 'food aid' to include more than in-kind distributions (Harvey et al., 2010). Although there is no consensus yet, food assistance has come to mean food-based transfers (food for work programmes), food subsidies, cash grants, agricultural and livestock interventions (Harvey et al., 2010). In this study, we use a broad definition of food assistance that includes 'food subsidies, strategic grain reserves, and social protection or longer-term social welfare programmes of both cash and in-kind transfers' (Jaspars and Sathyamala, 2021: 5). Given that food subsidies and grain reserves are integral to agricultural policies, the Indian case study examines the digitalisation of the agriculture sector and its consequences for food security of both the producer and consumer from marginal households. In that sense we include food production and food procurement, along with food distribution, as a welfare measure in our definition of food assistance, and examine how digitalisation is transforming them.

The following are some definitions for digital inclusion and exclusion used in India.

Digital Inclusion: Efforts and policies aimed at ensuring that all individuals, irrespective of socio-economic status, geographic location, or other factors, have equal access to and benefit from digital technologies ... Digital inclusion is considered a means to improve the digital divide, with the ultimate goal of achieving digital equity. Digital equity represents a state where all individuals have the necessary IT capacity for full societal, democratic, and economic participation. (New Indian Consumer Initiative, 2023)

Digital exclusion is identified with systemic differences in the access to and use of new technologies among individuals of different education, income, occupation, place of residence and stage of life. Though '**Digital Exclusion**' and '**Digital Divide**' are frequently used interchangeably, there is a thin line between the two terms. (Digital Empowerment Foundation, n.d.: 8, emphasis in original)

It can be seen that the concept of digital divide does not cover the whole spectrum of the phenomenon. It does not include the extent to which information and communication technologies are used by individuals, and leaves out the problem of the level of digital competences, the existence of the necessary infrastructure or the impact of social, economic, organisational and cultural factors. For these reasons, the term digital

exclusion seems more appropriate. (Digital Empowerment Foundation, n.d.: 8, emphasis in original)

2.3 Methods³

2.3.1 Study location

In Phase II, data collected were primarily qualitative with some elements of quantification. As described in WP-I, the study was located in two states, Delhi and Chhattisgarh. These two states were chosen as they reflect the two ends of the spectrum in terms of development, particularly infrastructure, which includes that pertaining to digitalisation.

Delhi is the political and administrative power centre of the country, and the logical assumption is that it would have the best infrastructure available, even for the poor. Delhi is highly urbanised but has a large proportion of marginalised populations, which includes the highest proportion of migrant populations, in the country. The study focuses on these populations.

On the other hand, Chhattisgarh state in central India is classified as one of the least developed regions of the country (*The Hindu*, 2021) and is one of the poorest states, contributing only 1.7% to national GDP (gross domestic product) in 2023–24 (Sanyal and Arora, 2024: 9). The state was formed on 1 November 2000 out of Madhya Pradesh state. It is largely rural with a high proportion of tribal population. As per a national survey the average monthly income of rural households for the year 2018–19 was INR 9,677 (US \$114) (Ministry of Agriculture & Farmers Welfare, 2022a) less than the national average. The state has both inward (within the state) and outward (interstate) migration. Marginal farmers (<1.00 hectares) form almost two thirds and small farmers (owning 1–2 hectares) form one fifth of the farming community.

Chhattisgarh has been called the richest poor state because of its vast mineral wealth (Kanoje, 2025). Although development has not been even throughout the state, '[s]ome of its initiatives, from reforms in the public distribution system to innovations in rural healthcare and programmes to enhance school enrolments [have gone] on to become national models' (Pattanaik and Singh, 2025: n.p.). Tribal communities, who are among the

³ Subodh Kumar and Arjun Dubey (IHD) and Ravindra Kurbude and Minal Madankar (JSS) contributed to this section.

most marginalised communities in the country, form one third of the population.

In Delhi state, two field sites in two different districts of Delhi with diverse communities and geographies were selected. The first is an urban resettlement colony in the North-East Delhi district, with a heterogeneous population. The main livelihood is street vending, daily wage work, waste picking and sorting. The settlement has a high population density, with narrow lanes, congestion and overcrowding. Although most of the residents are migrants from other states, since they have lived here for a long time, in some cases more than five decades, they are considered permanent residents of Delhi state. Average monthly income ranges from INR 6,000–9,000 (\$90–120) with upper range INR 30,000+ (\$450).

A contrasting second site is in the rural North Delhi district. The selected village has a low population density. Although agriculture is not the main occupation, it forms an important means of livelihood. Wheat, paddy and seasonal vegetables are cultivated. The village has a sizeable proportion of migrants who are engaged as farm labour or casual workers. They may be either seasonal migrants or households that reside here permanently, although they continue to maintain lively and regular connection with their ‘native’ village. There are also tenant farmers and sharecroppers, some of whom have ‘settled’ long enough to become permanent residents of Delhi state.

In the state of Chhattisgarh, from the selected district four sites were chosen. Three were in the rural area and one was an urban slum (shanty town) in the town where district administrative headquarters is based. Villages from three clusters were chosen in relation to their distance from the district headquarters town and forest: deep inside the forest (≈ 100 km), displaced villages from the forest (also within the forest) (≈ 100 km), and forest fringe villages (on the plains) (≈ 50 km). The residents of the urban slum are mostly daily wage earners, a considerable proportion of whom are migrants either from within the state or outside it. Farming is the main occupation in the villages. Being a single crop (paddy) economy, there is seasonal migration to the city or other states to work as daily wage labourers. Being

close to or located within the forest, the people supplement their incomes by gathering and selling seasonal minor forest produce such as tendu leaves.⁴

See Annex 1 for the map of India showing the location of the states.

2.3.2 Selection of households and respondents

In this Phase II of the study, emphasis was placed on collecting empirical evidence from recipients of food assistance programmes. As stated, this was primarily qualitative with some quantitative elements. Data were collected at the household level in all six field sites. The aim was to understand the effects of the digitalisation process from the point of view of the recipients who were the target of government welfare services, including the PDS. This was to find out about the respondents' experience of digitalisation of these safety net programmes, and to delineate factors that facilitate or act as barriers to accessing such benefits.

The study employed a two-stage mixed-method research design. In the first stage, households were selected purposively in the six field sites. Suitable respondent households were identified by frequent field visits. Initial identification was facilitated through informal interactions with community members, influential persons of the society, local farmer groups, teachers, Anganwadi workers, local Common Service Centres (CSCs) service point functionaries, and PDS shop owners. Since the focus of the study is on food-insecure, marginalised populations, special emphasis was laid on listing households that could be identified as poor based on certain key parameters. These were:

- PDS: eligibility (BPL/APL status) whether or not a ration card holder; whether or not dependent on PDS rations to fulfil monthly household requirements; eligible households that were excluded with the introduction of digitalisation.
- Occupational status: manual, semi-skilled daily wage labour (rag picker, construction worker, plumber); if rural, landless or marginal farmer households.
- Migrants: seasonal, circular, or long-term migration; whether experiencing disruption of welfare entitlements due to migration from the place of origin; whether they avail themselves of the ONORC (One Nation, One Ration Card) scheme or send remittances to their family in their village.

⁴ Tendu leaves (*Diospyros melanoxylon*), or *tendu patta*, are used primarily as natural wrappers for traditional hand-rolled slim tobacco cigars (see <http://www.mfpfederation.org/content/tendupatta.html>, accessed 2 August 2026). Tendu fruits are edible with high vitamin A and C content.

- Dependence on public welfare schemes as a primary source of social protection (beneficiaries such as persons with disability, old age, widows, etc).
- Other disadvantaged households such as single-parent households, woman-headed households (deserted, divorced or widowed).

From such a list, respondents of those households who consented to participate in the study were administered a structured questionnaire in Hindi (translated from English) that had been pre-tested in both Delhi and Chhattisgarh. The questions pertained to basic demographic information (household composition, occupation, educational status, marital status) as well as information regarding Aadhaar, PDS, banking, social welfare schemes, etc. Data were entered in Excel and analysed using SPSS.

From this group of respondent households in the quantitative survey, a smaller number of households was selected purposively for in-depth interviews based on the information from the household survey.⁵ The in-depth interview was semi-structured with open-ended questions which allowed the respondent to narrate their experiences without being led. A field guide was used for prompts and probes. The aim of this qualitative part of the study was to understand the complexities involved in negotiating a digitalised world by including a wide variety of situations present in precarious households. The focus was on the how and why. Therefore, those eligible households that had reported facing difficulties in accessing PDS or other social welfare programmes (such as old age pension, disability benefits) were intentionally included in the qualitative study. Households that did not possess a mobile phone were also selected to understand problems they faced while interacting with banks or in situations which required a mobile device or called for digital literacy.

The respondents interviewed in the in-depth interviews were not necessarily the head of the selected household because efforts were taken to include respondents from different age categories (below 30 years, between 30 and 50 years, and over 50 years) to understand generational differences if any in relation to digital processes. Special efforts were taken to include women in the household as respondents as they would be in a better position to

⁵ There was an exception to this. In the selected urban field site in Chhattisgarh (area code 04), while the HH quantitative survey could be conducted, the in-depth surveys could not be carried out in the same site. Therefore, the in-depth interviews were carried out with respondents in a different urban field site in the same town with a similar socio-demographic profile (area code 7). These households were included in the quantitative questionnaire as well.

respond to questions on food consumption. Hence some interviews had more than one respondent from a household participating in the interview. The in-depth-interviews were conducted mostly in respondents' homes (occasionally at their workplace such as the farm), by interviewers proficient in the local language, and lasted from half an hour to two hours; if necessary, a subsequent interview was conducted with additional follow-up questions. Informed consent was obtained for interviewing, for taking notes, or for recording the interview, as per consent.⁶ The Hindi transcripts and notes were translated into English and anonymised. Thematic analysis was done by manually coding and identifying patterns.

Table 2.1 gives the number of households covered in the household quantitative and qualitative surveys:

Table 2.1
Details of the households included in quantitative and qualitative surveys
(Delhi and Chhattisgarh)

Study location	Field site	Area code	No. in HH survey	No. in-depth survey
Chhattisgarh state	rural (forest villages)	01	22	10
	rural (displaced villages from the forest)	02	12	5
	rural (forest fringe villages on the plains)	03	25	11
	urban*	04	12	
	urban *	07		2
Chhattisgarh total			71	28
Delhi state	Delhi urban	05	39	13
	Delhi rural	06	21	7
Delhi total			60	20

* See footnote 5 for an explanation.

To triangulate information gathered through the in-depth interviews, focus-group discussions (FGD) were conducted in both Delhi and Chhattisgarh field sites. Table 2.2 gives details of the FGDs conducted in Delhi and Chhattisgarh field sites.

⁶ All gave verbal consent for this.

Table 2.2
Details of FGDs conducted in the two study locations

Study location	FGD site code	Date held	Facilitated by	Topics discussed	Participants		
					Male	Female	Total
Delhi State	05 (urban)	19.05.25	Somjita, Arjun and Chhaya	Aadhaar, banking, PDS, social welfare	0	7	7
	05 (urban)	18.05.25	Somjita, Arjun and Chhaya	Aadhaar, banking, PDS, social welfare	9	0	9
	06 (rural)	17.02.26	Subodh	Aadhaar, banking, social welfare			
Chhattisgarh state	01 (rural)	19.03.25	Minal, Prafull, and Sathya	AgriStack, digitalisation of land records, PDS, and banking	4	8	12
	02 (rural)	25.08.25	Minal, Anil, and Sathya	AgriStack, farmer laws, digitalisation of land, impact on bank, mandi, land records, etc.	3	12	15
	03 (rural)	18.03.25	Minal, Manju, and Sathya	Farmer laws, mandi related questions, digitalisation and impact on bank and mandi.	8	6	14

Along with the household surveys, in-depth semi-structured interviews were carried out with local-level informants such as: the PDS shop dealers/owners; those who provided digital online services, such as owners and functionaries of Common Service Centres (CSCs); elected and informal leaders; government-level functionaries such as the Anganwadi workers, as well as middle-level informants such as bank officers, government officials in the PDS, and rural development department implementing the AgriStack programme. A few high-level informants who were considered expert on areas relevant to the research were also interviewed.

2.3.3 Seasonal survey on connectivity

We also conducted a recurrent seasonal survey on the everyday experience of electricity supply and internet connectivity in Delhi and Chhattisgarh field sites. The survey form was developed and designed in KoboCollect and translated into Hindi.⁷ All the respondents were given a one-day training on how to install and use KoboToolbox on their mobile phone, on the questionnaire, and on how to develop and enter the data. After training, the trainees were asked to pilot the this process for a week prior to actual data collection.

⁷ KoboCollect is a tool to collect the data offline in mobile and then to sync it in the network so as to send data to the server.

In the two Delhi sites, the survey was administered in three rounds corresponding to summer (March 2025), monsoon (July 2025) and winter (December 2025–January 2026) seasons. Each site had a resident key informant who was digitally savvy; one was an owner of Customer Service Point and the other of a Customer Care Service outlet.⁸ They noted their household's experience of 'yesterday' (seven recall-day observations per round, 21 per site, 42 in total). This repeated, short-recall design allowed patterns of electricity and connectivity disruption, and their knock-on effects on digital payments, banking, and access to welfare services to be tracked across the year rather than captured as a single snapshot.

In Chhattisgarh state, 1–2 informants, who were residents of the village, were selected initially from each site to collect data. Selection of these informants was based on possession and regular use of a smartphone, and having general knowledge about electricity and the connectivity and infrastructure of the mobile network.

The informants were asked to fill in a questionnaire related to infrastructure (electricity, the internet, etc.) on day one and at the end of the research. Recurrent questions (use- and services-related) were asked every alternate day. Data from the following months was considered for four seasons – April (summer 2025), July (monsoon 2025), February (winter 2025) and May (summer 2026).

Unfortunately, uniform data could not be collected for all the sites for reasons such as mobile phone battery running out, no electricity being available, and sometimes no mobile data being available. Very little data was collected in the month of July 2025 (monsoon month).

2.3.4 Data collection in the Saagu Baagu case study⁹

For the Saagu Baagu case study in the state of Telangana, our study adopted an exploratory qualitative design. After the researcher had familiarised himself with the chilli farming project through published reports, including newspaper reports, in late November 2025 a two-day field visit was conducted. A snowball and lead-based sampling approach was employed, beginning with contacts identified from secondary programme reports and

⁸ They provide banking and other digital services to the population. For further details see Chapter 5.

⁹ Pratheep Purushothaman contributed to this section.

expanding through referrals by initial contacts and respondents. Two extensive interviews, and six informal interactions were conducted with key stakeholders, in addition to an informal group discussion with local farmers in a roadside teashop in Khammam town. These semi-structured free-flowing interviews were conducted in Telugu and subsequently translated into English by the researcher. Field notes were jotted down during and immediately after interactions, and later expanded and coded thematically to analyse technology adoption, institutional support, market dynamics, and agro-ecological constraints among the chilli growers who had participated in the Saagu Baagu project. Findings were triangulated against secondary documents.

Throughout Phase II, a literature review (both academic and grey) and reviews of policy documents continued as well as direct observations. Ethical protocols were observed throughout.

2.4 Challenges in data collection

Given that the study was largely qualitative, the limitations of qualitative data, such as small sample size and therefore problems with generalisability, and researcher's bias, would apply. Hence the findings are illustrative rather than statistically representative. However, wherever possible data was triangulated and a thick description deployed to demonstrate its trustworthiness. As stated in note 4, due to unavoidable circumstances, data collection in the slum in Chhattisgarh state could not be completed and we had to choose a different but a similar, slum to select respondents for in-depth-interviews. The Kobo connectivity study could not be conducted as per plan in the Chhattisgarh field sites. However, the reasons why data collection was irregular and incomplete in these areas also added to the contention that there is a regional and rural–urban divide in access to digital technology. In the case of the Saagu Baagu case study, it is based on data collected over two days from a small number of respondent farmers. These findings could not be confirmed with the staff of Digital Green who had overseen the project but did not consent to be interviewed.

3. *Khet se pet*: PDS and grain procurement¹⁰

3.1 Introduction

WP-I described the evolution of PDS, which has its origins in the rationing system introduced by the British colonisers during the inter-war period. When the PDS was initiated, it was a universal provision but, from the late 1990s onwards, with liberalisation, it became a targeted PDS (TPDS). Households were categorised into three groups with differing entitlements: Antyodaya Anna Yojana (AAY) households categorised as the ‘poorest of the poor’, below poverty line (BPL) households and above poverty line (APL) households. But with the passing of the NFSA (National Food Security Act) in 2013, the APL category was phased out, and only the BPL households, now termed ‘Priority households’ (PHH) were entitled to a specified quantity of food grains at highly subsidised prices. While in TPDS food grains were provided as a social welfare programme, under NFSA, it became a legal entitlement for the poor (NCAER, 2015). Moreover, the phasing out of the APL category under NFSA was considered an efficient move because, for a long while, allocation under this category had been considered one of the main sources of diversion of food grain (leakage) from the PDS (NCAER, 2015).¹¹

From the date of commencement of the NFSA (13 July 2013), for an initial period of three years, the price of grains for the beneficiaries were fixed at INR 3, 2 or 1 per kg for rice, wheat, and coarse grains respectively. After that period, the prices were to be revised by the central government; however, this plan was not adhered to in the following years.

In 2021, during the Covid crisis, under the name of ‘Pradhan Mantri Garib Kalyan Ann Yojana’ (PMGKAY),¹² ration card holders were provided with

¹⁰ The phrase *khet se pet* means from ‘farm to stomach’. This phrase was coined by the JSS village team members and is an improvement on the popular phrase ‘from farm to fork’, as it is only the elites in India who eat with a fork.

¹¹ This was largely due to a large amount of unclaimed food grains allocated to the APL category due to poor uptake as the subsidised prices were close to open market prices. These surplus grains in the PDS shops were then illegally diverted into the black market for profit.

¹² Pradhan Mantri Garib Kalyan Anna Yojana, translated as: The Prime Minister’s food grain scheme for the welfare of the poor.

an additional amount of 5 kg of grain (either wheat or rice) for free. On 1 January 2023, under the same name, a ‘new integrated food security scheme’ was launched, in which the AAY and PHH card holders were to receive their entire ration for free.¹³ This scheme of free grain distribution to card holders has now been extended until January 2029,¹⁴ a move that has been termed ‘more politically driven than welfare oriented’ (Das et al., 2024: 3).¹⁵

Annex 2 gives the timeline of the evolution of the PDS.

In 2014, a high-level committee (HLC) recommended digitalisation of the PDS as part of streamlining the programme on restructuring the Food Corporation of India (FCI). This committee, under the chairpersonship of former Food Minister Shanta Kumar, noted that diversion of grains from PDS (leakages) was as high as 46% at all-India level and that digitalisation would decrease leakages and increase efficiency of the system.¹⁶

[The] HLC recommends total end to end [sic] computerization of the entire food management system, starting from procurement from farmers, to stocking, movement and finally distribution through TPDS. It can be done on real time [sic] basis, and some states have done a commendable job on computerizing the procurement operations. But its dovetailing with movement and distribution in TPDS has been a weak link, and that is where much of the diversions take place. (Press Information Bureau, 2015)

Subsequently, in 2015, an Aadhaar-enabled PDS (AePDS) linking ration cards with the biometrics of the beneficiaries was introduced on a pilot basis in a district in Andhra Pradesh,¹⁷ and later expanded to the whole of India. In keeping with the call for an ‘end-to-end’ computerisation of the entire food management system, under the India Digital Ecosystem of Agriculture (IDEA) AgriStack system, digitalisation was introduced at various levels, starting with digitally identifying a farmer and their land.

¹³ <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1890272®=3&lang=2>, accessed 8 May 2026.

¹⁴ <https://dfpd.gov.in/pradhan-mantri-garib-kalyan-anna-vojana/en>, accessed 8 May 2026.

¹⁵ The charges are that it is for political branding and electoral gains.

¹⁶ The high percentage of ‘leakages’ quoted in the HLC report has been contested. The ‘biggest source of continuing leakages is the APL (and probably also “ad hoc quotas”)’ (Drèze and Khera, 2015: 42).

¹⁷ <https://dbtbharat.gov.in/success-story/view?id=NQ==>, accessed 6 August 2026.

This chapter describes the operationalisation of the first part of the PDS, which involves a complex process of procurement, transport, storage and distribution of grains, and its embedding in digital technologies. With the initiation of AgriStack, digitalisation of land records has become mandatory for farmers of all categories to enter the government-controlled system of procurement which offers a Minimum Support Price (MSP) for produce. The unique farmer ID has become mandatory for gaining access to government welfare benefits. This chapter discusses some of the critical issues faced by the small and marginal farmers, who form the bulk of the farming community, in this digital process.

3.2 The digital path to procurement of grains¹⁸

The PDS is operated under the joint responsibility of the central and state/Union Territory governments. It begins with the procurement of grains from farmers by the FCI. The FCI was set up under the Food Corporations Act 1964, to ‘fulfill [the] following objectives of the Food Policy’:¹⁹

- Effective price support operations for safeguarding the interests of the farmers.
- Distribution of foodgrains throughout the country for [the] public distribution system.
- Maintaining [a] satisfactory level of operational and buffer stocks of foodgrains to ensure National Food Security. Since its inception, [the] FCI has played a significant role in India’s success in transforming the crisis management oriented food security into a stable security system.

There are two types of procurement system for wheat and rice, the two major commodities distributed through the PDS: the Centralised Procurement System (Non-DCP) and Decentralised Procurement System (DCP).²⁰ The state of Delhi does not have a dedicated state-specific

¹⁸ Ravindra Kurbude and Minal Madankar (JSS) contributed to this section, which is based on key informant interviews (Food Controller – 08M02) and secondary literature.

¹⁹ Government of India (n.d.) ‘Food Corporation of India’, <https://dfpd.gov.in/food-corporation-of-india/en>, accessed 16 April 2026.

²⁰ See Procurement Policy on the Government of India website:

Centralized Procurement System (Non-DCP)

Under Centralized Procurement System, the procurement of foodgrains in Central Pool are undertaken either by FCI directly or State Government agencies procures the foodgrains and handover the stocks to FCI for storage and subsequent issue

cooperative marketing federation managing the PDS and is established under the Department of Food & Civil Supplies.

In the state of Chhattisgarh, which is a paddy cultivating state, paddy procurement is through the DCP system. Under this, two Chhattisgarh state level agencies, MARKFED (Marketing Federation)²¹ and NAN (Nagrik Aapurti Nigam/ Civil Supplies Corporation), carry out the purchase, milling, and storage of paddy and rice as well as distributing through the PDS. MARKFED is the state nodal agency for paddy procurement, storage and fertiliser distribution and is the primary entity that interacts with farmers and operates the procurement centres (samitis) where it buys paddy from farmers at the MSP.

Paddy procurement in Chhattisgarh begins between 15 November and 1 December. Farmers bring the harvested grain to village-level samitis (cooperative mandis) which are the Primary Agricultural Credit Societies (PACS). In Chhattisgarh, Token Tuhar hath (translated as ‘your hand’) android app has been developed for issuing tokens to the registered farmers for purchase of paddy.²² A farmer generates the token number by the app in his mobile and brings his produce on the allotted date and time. Those who do not have a smart phone can get the token from the committee. But this could mean spending time waiting in queues to receive their token which, during the height of the harvest season, could be considerable. Also, only a specified number of tokens are issued in a day and therefore a farmer without a smart phone may have to make several visits to the mandi to get his token.

against GoI allocations in the same State or movement of surplus stocks to other States.

Decentralized Procurement System (DCP)

Under this scheme, the State Government itself undertakes direct purchase of paddy/rice and wheat and also stores and distributes these foodgrains under NFSA and other welfare schemes. If the stocks of the Rice/wheat procured by the State Government exceeds its allocation under TPDS and other Welfare Schemes, such excess stocks shall be handed over to the FCI by the State Government.

(<https://dfpd.gov.in/procurement-policy/en>, accessed 16 April 2026).

²¹ MARKFED is the federation of all the mandi samitis (cooperative societies).

²² https://play.google.com/store/apps/details?id=com.nic.kisaan&hl=en_IN, accessed 20 April 2026.

3.3 AgriStack and the unique farmer ID (Kisan Pehchan Card)

At the mandi, first the farmer's ID is verified as only those who are registered on the AgriStack portal can sell their produce in the state-operated mandis. In 2021, a Unique Farmer Identification Number (UFID), a digital ID for farmers, was proposed by the government even though its creation, based on Aadhaar data, was said to be in violation of fundamental privacy rights and therefore in contempt of the Indian Supreme Court's orders in Aadhaar judgment (Burt, 2021).

The same year, the government announced that it would invite proposals for MoUs (Memorandums of Understanding) with private companies under PPP (public–private partnerships) to develop proofs of concept (PoCs) 'based on the federated Farmers' database'. This will be 'on purely pro bono

Box 3.1

Companies that have signed an MoU with the Indian government

Between June 2021 to February 2022, '10 MoUs were signed by the MoA with different entities to run the pilot projects in selected districts in different states.

1. Microsoft Corporation (India) Private Limited,
 2. Amazon Internet Services Private Limited (Amazon Web Services (AWS)),
 3. Esri India Technologies Private Limited (erstwhile Esri India Technologies Limited),
 4. Patanjali Organic Research Institute Private Limited,
 5. Star Agribazaar Technology Private Limited,
 6. Cisco Commerce India Private Limited,
 7. Ninjacart (63Ideas Infolabs Private Limited),
 8. ITC Limited,
 9. Jio Platforms Limited; and
 10. NCDEX e Markets Limited (NeML).'
- (quoted from Beriya, 2022: 5–6).

basis for a period of one year ... and some of them, if found beneficial to the farmers will be scaled up at National level' (Ministry of Agriculture &

Farmers Welfare, 2021: n.p).²³ See Box 3.1 (previous page) for the list of the private companies with which the government has signed MoUs.

In a press release in 2022, the Indian government announced the commencement of:

work for creating various agricultural services built around a core layer of Farmers' Database (Agristack) in the country. In order to create Agristack, the department is in the process of finalising the 'India Digital Ecosystem of Agriculture (IDEA)' which lays down a framework for building Agristacks. This Ecosystem shall help the Government in effective planning towards increasing the income of farmers in particular and improving the efficiency of the Agriculture sector, as a whole. As a first step, in this direction, the Government has already initiated building federated farmers' database that would serve as the core of the envisaged Agristack. (Ministry of Agriculture & Famers Welfare, 2022b: n.p.)

The press release also mentioned that the 'issue of data protection / data privacy etc. in the Agristack [were] being deliberated and hence, as of [then], no decision [was] taken regarding the mandatory enrolment of farmers in the Database' and 'the proposed farmers' database would include only the farmers registered under the PM-Kisan Scheme' (Ministry of Agriculture & Famers Welfare, 2022b: n.p.).

However, in 2024, AgriStack was launched as part of the Digital Public Infrastructure (DPI) mission to consolidate data of all farmers on a single platform comprising registries, datasets, application programming interfaces (APIs) and IT systems (Sharma et al., 2025). It was meant to answer three questions:

- Who is a farmer, and what is the extent of land they own?
- Where are those land parcels located?
- What crops does the farmer grow in each season on the land parcel? (Sharma et al., 2025)

The stated intention of AgriStack is to provide farmers with easier access to government programmes, advice, and markets and, at the same time, it is meant to improve the efficiency of targeted interventions by the government. The National Informatics Centre (NIC) developed the Bhuiyan

²³ 'A proof of concept (POC) is a small test to see if a project idea can work before you spend a lot of time or money.' <https://asana.com/resources/proof-of-concept>, accessed 30 May 2026.

app, a free Android mobile application, to provide instant access to land records.²⁴

From 2025, the UFID was made mandatory. This is a 10-digit number followed by a ‘checksum digit’, containing a farmer’s key details. ‘These include the farmer’s name, their *Aadhaar* number, the plot area, and the plot number ... of all the land parcels owned by the farmer across the state. The farmer registry links the farmer ID with the land parcels to verify the farmer’s identity’ (Nayak et al., 2025: n.p.).

A digital farmer card is essentially a multi-utility, technology-driven identity tool that consolidates various government schemes, subsidies, and agricultural data into a single platform. Unlike traditional paper-based methods, this card is digitized and linked to the farmer’s unique credentials, such as their *Aadhaar* number ... land records, and banking details. The primary goal is to create a streamlined ecosystem that reduces bureaucratic delays, prevents duplication of benefits, and ensures targeted delivery of agricultural support. (Verma, 2025: n.p.)

The farmers’ ID acts as a digital key²⁵ and links the farmer to four pillars of digital interconnection and departments (revenue, bank, procurement/milling, and distribution) allowing a seamless flow of the farmer’s data through all the departments/portals. Biometric authentication acts like an ‘electronic handshake’ between a beneficiary and the entire digital network connecting the four portals.²⁶

²⁴ According to the privacy policy of the app ‘[i]n addition, the Application may collect certain information automatically, including, but not limited to, the type of mobile device you use, your mobile device’s unique device ID, the IP address of your mobile device, your mobile operating system, the type of mobile Internet browsers you use, and information about the way you use the Application. We may disclose User provided and Automatically Collected Information: as required by law, such as to comply with a subpoena, or similar legal process; when we believe in good faith that disclosure is necessary to protect our rights, protect your safety or the safety of others, investigate fraud, or respond to a government request; with our trusted services providers who work on our behalf, do not have an independent use of the information we disclose to them, and have agreed to adhere to the rules set forth in this privacy statement.’

https://bhuiyan.cg.nic.in/privacy_policy.html, accessed 8 May 2026.

²⁵ A digital key is a secure, virtual credential stored on a smartphone that allows the person to log onto a online system.

²⁶ Both authentication and verification are foundational components of a digital identity process (Telesign Team, 2025). ‘Verification is the process of **confirming** the identity of a user, device, or entity **before granting access** to a system or service’, and ‘Authentication is the process of proving a verified identity by using credentials like passwords, one-time passcodes (OTPs), or biometric data. It takes place after verification, ensuring that the

3.4 Paddy procurement, storage, and distribution

In the state-operated mandis, a farmer is allowed to sell only 21 quintals per acre at the MSP, which is fixed by the central government (in 2025 it was INR 2,300 per quintal; approximately \$24) and an additional ‘bonus’ by the state government (in 2025 it was INR 800 per quintal; approximately US\$9).²⁷ A society software²⁸ verifies landholdings and quantity to be bought from the farmers; and the farmer’s biometric and e-KYC verification is done through the Aadhaar-linked biometric system to ensure that the sale money goes to the genuine farmer’s account as per records. Once authentication is verified, the individual produce (paddy) is assessed for quality (Fair Average Quality – FAQ – should have less than 17% moisture), weighed, and the data is uploaded on the portal by the data operators employed at this level.²⁹

MARKFED manages the storage of paddy stock in mandis until it is lifted (sold) for custom milling (CM) by the millers. As soon as the paddy is sold in the mandis, which is usually within six to seven days of procurement, MARKFED transfers the MSP purchase amount directly into the farmer’s bank account.

Once paddy is procured, the NAN civil supplies corporation takes over the logistics of custom milling and distribution. It also conducts claim submissions of (NFSA/Krishak Unnat Yojana) to the FCI/state government. Miller modules manage registration of private millers.³⁰ The

person trying to access an account is the rightful owner of the previously verified identity’ (Telesign Team, 2025: n.p.; emphasis in original).

²⁷ Exchange rate US\$1 = INR 87. <https://www.exchangerates.org.uk/USD-INR-spot-exchange-rates-history-2025.html>, accessed 17 August 2026.

²⁸ This is a software used by the mandi operator at the time of procurement of paddy. It is linked to the Bhuiya app and to the farmer’s bank account, and it does e-KYC verification and token management.

²⁹ ‘FAQ specifications are the minimum quality standards that foodgrains must satisfy to be eligible for purchase under India’s Minimum Support Price (MSP) scheme. They define the acceptable physical and sanitary condition of grains – covering moisture content, foreign matter, damaged or broken grains, and freedom from toxic substances – at the time of procurement.’ <https://agriculture.institute/institutional-support/fair-average-quality-foodgrain-procurement/>, accessed 10 May 2026.

³⁰ The miller module is a digital sub-system within Chhattisgarh’s online PDS and paddy procurement portal. It allows registered rice millers to log custom milling data, track

app tracks the amount of raw paddy that goes to the millers and the amount of milled rice returned to the government. Millers apply online to get a 'Delivery Order' (DO) and a specific amount of paddy is allotted to them for custom milling. The miller needs to provide an e-bank guarantee and post-dated cheque as a security deposit for the amount of paddy they lift from the mandi. Once the DO is issued, the official vehicle goes to pick up the paddy. The government takes 67% of that paddy which is cleaned white rice, 'Arva', and for parboiled rice, 'Usna Chawal', 68% is taken; the rest is the miller's fee/income. In the state of Chhattisgarh there are 177 millers, all of whom do custom milling for MARKFED.

Following milling, the rice is blended by the miller with fortified rice kernels in special facilities as per the guidelines provided by the NAN.

Fortified rice is then stored by the CGSWC (Chhattisgarh State Warehouse Corporation) and in FCI godowns for further distribution to PDS shops under local welfare schemes and the NFSA, and any surplus is stored in FCI godowns. Quality checks are carried out by NAN's local food quality inspectors.

Storage and lifting of milled rice are done through IMPDS (the integrated management of public distribution system) This system is meant to track the movement of every bag from the procurement centre to the miller, and to the FCI or the PDS shop. The primary goal of IMPDS is to ensure nationwide portability of food grains from any PDS shop; this is essential in order to maintain a 'One Nation, One Ration Card' (ONORC) environment. IMPDS data acts as a backend for the ONORC scheme; that is, the beneficiary can take their ration from any PDS shop using biometric authentication which is managed by NAN.

NAN also manages the paperwork for the subsidy claims and local PDS. Subsidy claims for distributed grain are verified against actual biometrics of citizens. PDS money is reimbursed only for the claims of those whose biometrics are available in the database. NAN is a state agency involved in subsidy claims settlement for the quantity of rice distributed in PDS and the amount of rice given to the FCI. Central government reimburses the state government after PDS claims have been submitted and fulfilled from FCI stocks by the state. NAN submits the claims based on online transactions as

paddy-to-rice conversion ratios, manage agreements, and report stock information to the state's Food Department and MARKFED.

registered by the ePOS machine in each PDS shop, and verifies these online transactions by doing a physical audit as well.

Occasionally, when the central pool has grain in excess, the central government authorises private millers to export surplus rice from states like Chhattisgarh to the international market to manage stocks.

Annex 3 provides a flow chart showing the process from procurement of paddy to distribution of fortified rice in the state of Chhattisgarh, highlighting the places where digitalisation plays a key role.

3.5 Ground realities

3.5.1 AgriStack favours the landed and not the tiller

The above complex account of the procurement processes up to the point of distribution to the beneficiaries intends to give a picture of digital efficiency. According to the government, as of 19 March 2026, more than 92 million farmer IDs had been generated (Ministry of Agriculture & Farmers Welfare, 2026). However, this number does not reflect the actual number of ‘farmers’ who live off the land, the way a farmer is defined in this system relies on land records. In AgriStack, only a person who owns land is defined as a farmer:

This is a practical design choice, but it also creates the deepest fairness risk. Land records help because they provide an existing base. However, they do not always capture the full truth of rural cultivation. In many places, the person who owns the land is not the person who actually farms it. In other places, mutation is delayed, family arrangements remain informal, maps are old, and inherited possession does not promptly appear in the revenue record. (Srinivasan, 2026: n.p.)³¹

For instance, a landowner by virtue of a farmer ID registered in his name would be able to access all the benefits entailed, even though the land may be cultivated by a tenant farmer or leased out for sharecropping.

The PM Kisan scheme provides financial assistance to all cultivable landholding farmer families across the country. Under this scheme, an amount of INR 6,000 (US \$71) is transferred annually in three equal instalments of INR 2,000 (US \$24) directly into the Aadhaar-seeded bank

³¹ Land mutation is the process of updating of revenue records following a transfer or succession.

accounts of the farmers.³² This is available to the landholder even if they are not engaged in cultivation.

Hence, the actual tiller will not/does not receive any benefits.³³ The government too has admitted that the ‘PM-KISAN Scheme is applicable only for cultivable landholding farmers, irrespective of the size of their landholding’, and that there was no proposal to include sharecroppers, tenants and landless labourers in the scheme (Government of India, 2025b: n.p.)

In 2025, a performance audit of India’s farm support schemes showed that benefits such as Pradhan Mantri Kisan Samman Nidhi was universal for landowners but excluded tenants and landless labourers from land-linked benefits such as the MSP, Pradhan Mantri Fasal Bima Yojana, Modified Interest Subvention Scheme (MISS),³⁴ and the Agriculture Infrastructure Fund (AIF) (Srinivasan, 2025). Table 3.1 provides a list of issues with the unique farmer ID system, and the concerns they raise.

³² See: <https://www.pib.gov.in/PressReleaseDetail.aspx?PRID=2275744®=6&lang=1>, accessed 12 August 2026.

³³ ‘Inclusion of tenant farmers under PM Kisan’, the title of the announcement in the Press Information Bureau (Ministry of Agriculture & Farmers Welfare, 2024, n.p.), is misleading because within the text it states: ‘[p]resently, there is no proposal under consideration to expand the scheme to tenant farmers’.

³⁴ Kisan Credit Schemes: Modified Interest Subvention Scheme (MISS) in which farmers receive ‘short-term loans of up to Rs.3 lakh through Kisan Credit Cards (KCC) at a subsidized interest rate of 7%, with 1.5% interest subvention provided to eligible lending institutions’ (Ministry of Agriculture & Farmers Welfare, 2025: n.p.)

Table 3.1

Issue table: AgriStack Farmer ID at a glance

Issue	Government position	Critical concern	Why it matters
Purpose of Farmer ID	Digital identity for scheme delivery and verification	Efficiency may overshadow fairness	Welfare systems must be accurate as well as fast
Dependence on land records	Registry follows official land-record logic	Records may be old, incomplete, or title-contric	Wrong base data can produce wrong digital outcomes
Tenants and sharecroppers	Provision exists to onboard them	Inclusion may still depend on extra steps and local discretion	Actual cultivators may remain under-recognized
Women farmers	Included in principle	No clear separate data in the PIB note	Invisible labour may remain invisible digitally
Verification model	More than self-declaration	Still not final proof	Official recognition is not the same as title certainty
Digital access	FPOs, CSCs, KrishiSakhis, camps support registration	Dependence on support agents can create friction	Formal inclusion may still hide practical exclusion
Data governance	Digital ecosystem is expanding	Privacy, ccrrrection, and grievance rules need fuller clarity	Trust will shape long-term public acceptance

Source: Srinivasan (2026: n.p.).

3.5.2 AgriStack does not benefit smallholders

Empirical evidence from our study, collected in Phase I in Chhattisgarh and presented in WP-I, shows that even if a farmer did possess land, the small and marginal farmers could not or did not benefit from the several schemes, some of which had existed even prior to the digitalisation drive.

Of the 22 respondents in the study, only one had no knowledge of the KCC (Kisan Credit Card). Among the others, only three households had accessed the Kisan Credit scheme (two of them were small farmers and one marginal). One respondent (smallholder) had accessed it in the past. The remaining 17 had never registered for this scheme. Only three households (all marginal farmers) were receiving financial assistance through the PM Kisan scheme. The rest of the households had not applied for it. One

household had tried to but was not successful³⁵ (Sathyamala and Laha, 2025: 33).

One reason for not accessing welfare benefits was absence of proper documentation of ownership of land. In seven households, the ownership of land was in the name of respondent, in five it was in the name of the father or father-in-law, in three it was in joint ownership (brothers; husband and wife), and in two it was in the husband's name. In five cases, the cultivated land belonged to 'common' land and had been traditionally farmed by the family. Fourteen respondents affirmed the possession of document of ownership and two others were not sure of such documentation. Six households, including the five cultivating 'common' land, did not possess any documentation (Sathyamala and Laha, 2025: 31).

If land is jointly owned, either by a husband and his wife, or among siblings, only one person, in whose name the land is registered or who is nominated by the family, will be eligible to access benefits such as Kisan Samman. This would lead to discrimination against the wife or younger siblings. Moreover, in this region, where tribal communities have traditionally cultivated common land, such documentation does not exist for many households and so they are unable register themselves in AgriStack to get their unique ID and the various benefits it entails.

In addition to this, there is the issue of the quantum of produce from such small plots of land. Our study found that in this primarily rain-fed area, the surplus generated in marginal farms was so low that it was mostly used for self-consumption. Among the small farmers, the marketable surplus may be larger than that of the marginal landholders and they, in general, would seek to sell it at the mandis. But this is possible only if they have proper documentation of land ownership which, as stated, may be non-existent, especially when the cultivated land is common land. As per digital records these farmers do not exist and therefore are invisible to the state.

In 2025, registration in the AgriStack portal was launched in a campaign mode. Despite receiving no real, or little personal benefit by creating a digital record of their land, the marginal farmers who did possess land with

³⁵ Thirteen (59%) respondents were from the marginal category, owning < 1 hectare of land, eight (36%) belonged to households with 1 to 2 hectares of land (smallholders) and one had 7 acres (2.8 hectares) but was cultivating only 2 hectares of land (Sathyamala and Laha, 2025: 31).

documentation were forced into registering for the farmers ID by the local administration.

In the *Report of the Committee on Doubling Farmers' Income* (Committee on Doubling Farmers Income, 2017), the government too had acknowledged that landholding was a critical factor in accessing government benefits and favoured including only the farmers with more than 2 hectares of land. The question then is, why is the government insisting that digital IDs would benefit the small and marginal farmers and forcibly registering them?

This question was taken up by scholars and activists as early as 2021. Garg and Singh (2021), from the Internet Freedom Foundation, state that the MoU between the Department of Agriculture and Microsoft appears to propose that farmers' data will be used for identity authentication and speaks of a data sharing agreement between the Agriculture Ministry and Microsoft.³⁶ While the authors acknowledge that this might help in cleaning land records, they raise issues of confidentiality, data protection and possible land grabs by large-scale agribusinesses as has happened in Latin America.³⁷ The loss of privacy could affect the farmers in the following ways:

1. Financial lending models relying on technology towards farmers may offer usurious rates for those in dire need.
2. ... risks of exclusion which has been well documented by studies on Aadhaar-linked welfare delivery systems.
3. Algorithm based decision making may further reduce the agency of farmers. (Garg, 2020: n.p.)

These concerns continue to be present even today as they have not been acknowledged or adequately addressed by the government.

3.6 Concluding remarks

This chapter described in detail the processes of procuring and storing of grain for the PDS from the field (*khet*) to the godowns and the embedding of digital technologies at various levels in the Chhattisgarh field site. The introduction of digitalisation in the form of the unique farmer ID for

³⁶ Garg and Singh (2021) accessed the MoU between the Department of Agriculture and Microsoft, and a document entitled 'Standard Operating Procedure (SOP) for verifying Farmer's Database (100 Villages)' through the Right to Information (RTI) Act.

³⁷ See: <https://news.mongabay.com/2020/10/digital-land-grab-deprives-traditional-latam-peoples-of-ancestral-lands-report/> (accessed 13 August 2026).

procurement of grains from the farmers has meant the forcible registration of their land in AgriStack whether they access the mandi or not. The question is why so much effort is being put to register every single piece of land, however small. It is clear that this is a mapping exercise that makes visible what has been largely invisible. That this could be the first step towards dispossession, legally speaking, is an issue of concern.

Moreover, the unique farmer ID recognises only those who own the land with legal documents to prove ownership, and not the cultivator who could be a tenant farmer or sharecropper. Thus, it should be termed a ‘unique landowner ID’ rather than a ‘unique farmer ID’. Further, a landowner is only recognised as one if they possess proper title to the land in their name. This discriminates against younger siblings and women. Tribal areas pose a special problem in that farmers may be traditionally cultivating common land for generations without legal documents. All these farmers become non-existent or ‘ghost’ farmers because they are invisible to the digital eye.

The following chapter looks at the pathway to *pet* (stomach), that is, the distribution of foodstuffs through the PDS and the role of digitalisation, so as to examine how it has impacted the lives of the recipients and the functionaries in the system.

4. Khet se pet: Distribution of PDS rations

4.1 Introduction

From the warehouses, the PDS commodities are distributed through Fair Price Shops (FPSs), known locally as ration shops. These shops are licensed under Section 3 of the Essential Commodities Act (1955) and are known as FPSs because, in the past, they would sell certain essential commodities such as wheat, rice, lentils, sugar, and kerosene at subsidised rates fixed by the government (at both the central and state levels). Over a period, the number of commodities under PDS was reduced and today it is mostly rice and or wheat that are distributed through these outlets.³⁸ The FPSs are managed by the Department of Food Supplies and Consumer Affairs, and the licence is issued by the Food Security Officer (FSO). The shops can be owned by individuals, cooperative societies, self-help groups or panchayats.³⁹ Among these, individual private ownership forms the dominant category. In 2021, at the national level, there were 538,000 FPSs.⁴⁰ Of these, more than 300,000 were run by private individuals, 100,000 by cooperative societies and self-help groups, and about 10,000 by panchayats (PTI, 2023). By 2026, these numbers had reduced. According to the government website, currently there are 477,999 FPSs, of which 246,741 are owned by individuals, 80,720 by cooperatives, 21,712 by self-help groups, and 8,342 by panchayats.⁴¹

³⁸ Some states, like Tamil Nadu, continue to distribute sugar, lentils, edible oil, and kerosene at subsidised rates, in addition to rice and wheat.

³⁹ Enabled by the 73rd Constitutional Amendment Act of 1992, panchayats are elected bodies in the rural sector that oversee local development, the implementation of government schemes, etc.

⁴⁰ Ministry of Consumer Affairs, Food & Public Distribution, ‘5.38 lakh Fair Price Shops (FPS) operational in the country’. [https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1740687®=3&lang=2#:~:text=Press%20Release:Press%20Information%20Bureau.Public%20Distribution%20System%20\(TPDS\)](https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1740687®=3&lang=2#:~:text=Press%20Release:Press%20Information%20Bureau.Public%20Distribution%20System%20(TPDS).). Accessed 13 February 2026.

⁴¹ <https://nfsa.gov.in/public/nfsadashboard/Publicfpsdashboard.aspx>, accessed 10 May 2026.

This chapter delineates the process of PDS distribution at the ration shops and includes the experiences and perceptions of both the ration shop dealers and the PDS beneficiaries

4.2 Identification of a beneficiary

In both Delhi and Chhattisgarh, the PHH (BPL) and the disabled household cards, and in Chhattisgarh the APL categories, are based on an overall socio-economic survey conducted by the government. However, all other categories, including AAY, are based on individual applications and assessment, introducing an element of bias because of subjective criteria.

Within a particular state, the identification of eligible households, the issue of ration cards, and the monitoring of the FPSs are the responsibility of the state governments. According to one of the Food and Supply Officers in Delhi state (06M01), since December 2020, no new cards have been issued, and no new members have been added in existing card of any category. However, applications for new cards were being accepted in online mode. Applicants who are digitally literate could apply through their mobile phones on using the e-district portal to select his/her district. If the person is not digitally literate, they could apply through one of the Common Service Centres (CSCs). Delhi state government had also issued a free-to-call helpline number – 1976. If contacted, a government representative will visit the applicant and help him/her to fill in the application form. This service is free of cost.

In 2018, the Delhi state government, with the help of volunteers, had conducted a household survey to identify ineligible households who were receiving rations (06M01). A questionnaire was administered regarding all information related to ration card. To ascertain if a person was alive or not, and whether daughters had got married and left to live with their husbands, every individual whose name was in the card was made to sign against their names. After completion of this survey, more than 250,000 names had been removed from his zone alone.

The following section describes the profile and functioning of ration shops, in the two field areas – Delhi and Chhattisgarh – separately. This is followed by the experiences of those who are its beneficiaries in these two states.

4.3 PDS in Delhi: Functioning of the ration shops

From the time of the NFSA, there have been only two cards, those for PHH and those for AAY households, and their entitlement is as follows (Table 4.1).

Table 4.1

PDS entitlements under the NFSA

Category	Wheat	Rice	Sugar
Priority household (PHH)	3 kg/ member	2 kg/ member	-
Antodya Anna Yojana (AAY)*	21kg/card	14 kg/card	1 kg/card

* Irrespective of the number of members in the household.

When issuing AAY cards, preference is given to single/divorcee/deserted women, households with a physically and mentally handicapped person, and households that do not have any source of income (06M01).

In Delhi state, all FPSs are privately owned. On 14 February 2026, as per the Delhi state website, there were 1,949 FPSs, of which 1,610 were active, and there was a total of 1,549,322 ration cards.⁴²

4.3.1 Profile of the ration shop dealers in Delhi field site

Of the nine shops in the urban field site (area code 05), owners of eight were interviewed (one shop owner refused to be interviewed). In the rural field site (area code 06) there was only one ration shop and the owner was interviewed. All the ration shops in the Delhi field sites are privately owned.

In two cases, one family owned two ration shops under two different family members' names (either brothers or husband and wife). Only one shop was under the ownership of a woman (wife of another ration shop owner; 05L07 and 05L08). One person owned two shops. In two cases, there was an inter-generational ownership, with the ownership passing from father to son, almost like an inherited family business. All the owners were from the Hindu upper caste community. A few of them appeared to be wealthy. For instance, one respondent (05L03) manages two ration shops (his and his

⁴² <https://epos.delhi.gov.in/index.jsp>, accessed 14 February 2026.

brother's) and is also a property dealer, and the son of another was an income tax officer.

The start of their ownership dated from 1976 up to 1988, with the shops currently handling anywhere between 1,100 (highest) to 500 (lowest) ration cards. While, according to the respondents, their names were selected initially through a lottery system, it was not clear how they were allowed to carry on for so many years with no change in ownership during the past three to four decades.

4.3.2 Procedure followed at ration shops

The ration arrives at the FPS from the godown (warehouse) of the Department of Food and Supplies around the 26th or 27th of every month, but sometimes it could get delayed and then the distribution would also be delayed (05L01). Other dealers, who received rations from a different godown, reported that rations reached them by the last ten days of a month (05L02), or the beginning of the month (06L01). When the loaded truck leaves the warehouse, the owners receive an SMS on their phones. The cost of transportation is borne by the department but the cost of unloading at the shop is borne by the shop owners; one dealer (06L01) reported that the unloading cost was INR 6 per quintal, which in his case would work out to be around INR 1,500 to INR 2,000. Alongside, there is an official WhatsApp group of the PDS department in which information and communication are recorded. Left-over rations at the end of the month are added to the next month's supply and the supply from the godown is reduced accordingly.

The PDS dealers have the mobile numbers of the beneficiaries and share information regarding the time of distribution of the rations, when the distribution will stop, the days fixed for home state, and days fixed for IMPDS distribution. While ration cards have a registered mobile number, often the beneficiary cannot be contacted because it no longer connects for a variety of reasons.⁴³ If any beneficiary has not collected the ration, they are sent reminders. The Delhi state residents get their ration in the first week or 10 days of every month, whereas the migrants get theirs after the first week or after the 10th of every month. The dealers get three months' worth of ration for IMPDS in advance (05L03).

⁴³ These could range from the phone being lost or not working, to the mobile number being discontinued because of the phone not being recharged, etc.

In 2018, ePOS machines were introduced and all the owners received a three-day training at the office of the Food and Civil Supply Department on how to handle the machine.⁴⁴ If the operating system has software updates, or if the department deems it necessary, then the owners are called again for training. Shop owners (05L01 and 06L01) demonstrated and explained the process of using an ePOS machine:

The ePOS machine was switched on by the thumb scan of the ration shop owner. Once it is logged in, there were some options which the owner did not show [the field team]; after selecting a specific option, the screen showed two screen bars – Delhi and IMPDS (the latter for those whose ration cards are registered outside of Delhi). For beneficiaries from Delhi state, their ration card number is required and for those outside of Delhi, their Aadhaar number is needed. Once the number is entered into the machine, the machine shows the details on how much ration the household is eligible for. The dealer clicks the name of the individual who has come to collect the ration. The individual would then need to put his/her thumb impression on the machine, and the ePOS will match it with the database. Once the thumb print is scanned, a slip is generated for the transaction. If there is a match, then the dealer gives the designated quota of rations to the beneficiary. After giving the ration, the beneficiary gets the receipt from the ePOS machine – the receipt contains the amount of ration received, date when it was given, dealer's name, licence and location. The beneficiary does not receive any intimation on his/her mobile phone. The same process applies for both Delhi residents and migrants. The total income from the commission on the sale is transferred directly into the dealer's bank accounts. (Fieldnotes, Arjun Dubey and Chaya Sharma, 28 Feb. 2024; Subodh Kumar, 23 Apr. 2024)

If the machine is unable to scan the user's fingerprint (the shop owner said this often happens in the case of the elderly), an iris scan will be tried. If that does not work, they will ask the beneficiary to wash their hands with soap and wash their faces.⁴⁵ If there is no match even after all this has been tried, then the dealer cannot give the ration to the beneficiary. The beneficiary could send another household member whose name is on the ration card or,

⁴⁴ 'E-PoS helped in the distribution of ration commodities to the real beneficiaries and the return of the surplus to the government with correct weight measures. This system is successful in putting barriers on black marketing of commodities.'
<https://www.deccanchronicle.com/nation/current-affairs/230218/e-pos-initiative-in-pds-saved-rs-578-crore-for-telangana.html>, accessed 4 August 2026.

⁴⁵ This practice is incorrect because, while dirt may need to be removed, soap will remove natural oil as well (see <https://ensearch.com/disappearing-fingerprints/>, accessed 21 June 2026) and face-washing will not help with an iris scan.

if residing in the urban area, the beneficiary could try at another shop. If any person/family's Aadhaar card or iris repeatedly don't match, then they are to go to the department and get their ration card attached to someone else's card, who will be the nominee. The latter can then collect the ration from the PDS shop on behalf of the ration card household. If the ePOS machine stops working, 'we register a complaint, after which a staff member from the ration office visits to repair it. We do not incur any expenses in this process' (05L07).

According to the owners, during Covid times the iris scan was used regularly. Since then it has not been used, and they opined that the machine was probably no longer functional. 'During Corona times we used it quite a lot. But now we do not use it at all. By now, it must have become "bad", who knows?' (05L06).⁴⁶ Similar statements were made by other PDS shop owners too.

The same process applies for the migrants as well for accessing rations. In the PDS shop at the rural field site, the dealer (06L01) reported that among the card holders, 60% were permanent migrants, but because they had received their ration cards in Delhi before 2015–16, they were of the same status as that of the native (Delhi) residents. Apart from this, every month, approximately 60 to 100 migrants collect rations from his shop, with the highest proportion of the migrants coming from Bihar, followed by Uttar Pradesh.

There is also a provision in IMPDS for sole migrant individuals living in the city and the rest of the family living in the village. S/he can collect his/her quota of ration in the city while the other family members can get their ration from the PDS dealer in the village.

Before ePOS and Aadhaar seeding, people who did not need the ration would transfer their ration to a more needy person/family and get them to collect it, which is not possible in the current system. Under the current system, if a person does not collect rations for a month, it lapses as one cannot collect more than their monthly quota at a time. Under the IMPDS, if a card holder does not collect rations for three consecutive months, s/he will have to go back to the village and get the ration card updated by the department. Otherwise, his/her card will be deemed invalid and will be assigned to the 'ghost' category.

⁴⁶ 'Corona k time zyda istemal krte they, ab toh krte hi nahi, ab tk toh kharab bhi hogyi hogi, kaun check krta hai.'

To deal with corruption, a vigilance committee is set up under the local MLA (Member of the Legislative Assembly) to ensure proper functioning of the ration shops. However, according to one dealer (05L01), ‘there has never been any intervention of any sort. It is just there for the sake of it.’ Nevertheless, the dealers went to some lengths to convince the researchers that they voluntarily followed rules, particularly about shop timings.

4.3.3 Perceptions and feedback from the shop owners

All of the shop owners opined that the Aadhaar-based distribution system was beneficial for both the dealers and the beneficiaries. For the dealers, it had reduced paperwork greatly. ‘In the past it would take one to one and half hours [everyday]; now a beneficiary can avail ration from any shop. Anyone from the house [whose name is in the card] can come, put their thumb, and get rations’ (05L01). ‘The current system is much better than the earlier one as the machine has all the records’ (05L03). ‘These days it’s quite convenient for customers as well as ration shop owners. Earlier, people had to wait in a long queue. Now, they simply bring their ration card and take the ration by putting their fingerprint’ (05L02). This was not strictly true because the field team found people, mostly women and young people, queueing outside the ration shops at the beginning of the month when rations were distributed. The other benefits, according to the owners, were that duplicate cards had been cancelled, and that anyone from the household whose biometrics are recorded can avail the rations. Comparing the old system with the current one, this was deemed to be better. That the beneficiary could avail from any of the ration shops in the neighbourhood, was seen as an important advantage, although this was true only in the urban area. In the rural field site, a single shop catered to two villages and beneficiaries from the distant village spent an hour walking to the ration shop. Even in the urban areas, beneficiaries were not necessarily aware of this possibility (see Box 4.1 for an account of this).

Box 4.1

Migrants and the concept of ‘One Nation One Ration Card’ (ONORC)

As we [field team] approached the PDS shop in — we found it closed and when we asked around, people shared that the shop remains closed from 1 p.m. to 4 p.m. [the rule is till 3 p.m.]. There we encountered a beneficiary who takes the ration from this particular shop. He works as a *beldar* (labourer) and is currently working at a construction site in —. He lives in the *jhuggi* [hut] near — and had come during his lunch break to collect rations from the shop. With the shop closed, the beneficiary was heading back to his work site. We approached him and told him that he could take ration from any other shop not just from the shop he regularly visited. We told him about another ration shop which was just in the next lane and that he could collect his ration from there. We accompanied the beneficiary to the shop.

It seems like people are still unaware that they can get their ration from anywhere.

His ration card had three members and was not an AAY card, meaning he was entitled to 15 kilos of ration (3kg wheat and 2 kg rice for each of the three members). However, the beneficiary requested the ration shop owner for wheat in lieu of rice as they did not consume rice. The shop owner obliged and he received 15 kgs of wheat from the shop.

A question arose in our minds whether ration shop owners often entertained such requests from the beneficiaries? If yes, then how do they adjust the ration in their records? We did not ask the owner lest it put him on the defensive.

The beneficiary has been working as a *beldar* (labourer) for many years and told us that he did not face any issues related to fingerprint while collecting rations.

(Field notes: Arjun Dubey and Chaya Sharma, 1 May 2024)

The dealers said that earlier there used to be long queues and, moreover, ‘in the past if there was a conflict with the ration dealer, then the beneficiary faced problems in accessing rations. But now if any dealer troubles them, the beneficiary can go to another ration shop and get the rations’ (05L03). However, in the rural field site this was not possible.

At times the IMPDS card holders might also join the queue in the beginning of the month when ration was being distributed for the Delhi state card holders. Instead of telling them the truth, one dealer (05L06) said that although he knew that the IMPDS distribution will be only after the first

week of the month, he would still pretend to check and then tell them that they will get it on the 6th or the 7th as otherwise they might think they are being refused deliberately.⁴⁷

There were some disadvantages such as the server being down, at times for half an hour or much longer, in which case people had to come again when it started functioning.

Some of the dealers tried to convey the impression that they were in this only for altruistic reasons. 'The reason for opening this shop is to serve the marginalised section of the society' (05L03). One dealer (05L02) said that although he operates the ration shop, he does not really need to. This was because, apart from the PDS shop, the respondent owns two shops just adjacent to it (where the interaction happened): 'My son is an income tax officer; I have absolutely no need to run the ration shop'.⁴⁸ Another dealer (05L02) said, 'If there are elderly and disabled people in the ration line then we give them first.'

The owners also went to some length to convince the field team that they kept to the rules. One dealer (05L03) said that he kept the shop open the whole month even if rations finished because if the inspector came and found the shop closed, then there was a chance of sealing the shop. However, in general this was not strictly true. Unless the shop dealt with other groceries, it was not unusual to find ration shops closed once rations finished. '*Ration nahi hai*' (no rations) was written on the door of the shop in white chalk. This made sense because there was no point in keeping the shop open if there was nothing to distribute. Sometimes, as in the case of one respondent (05L06), the shop was open when the field team visited, but although it was the 5th of the month and other ration shops had people queueing in front of them, he was not distributing rations because the worker had taken half a day leave for personal reasons.

There were also reports of the unreasonable moves by the department. For instance, one respondent (05L09) stated that,

[a]bout 7–8 years ago, I became very ill. I was admitted to the hospital. When I was admitted in the hospital, an inspection was carried out by the food commissioner. Finding the shop locked, the food commissioner

⁴⁷ 'UP vale line mai lagte hain, hum check kar ke bolte hain ki ration 6–7 ko milega. Pata hai hume nahi milega par un ke saamne check karte taki unko ye na lage ki hum jaan bhuj ke nahi de rahe hain.'

⁴⁸ 'beta income tax officer hai, koi aisi zarurat nahi hai mujhe ration dukaan chalane ki'.

sealed the shop. After the shop was closed, I tried very hard to get this shop reopened. For this, I went to many government offices, submitted application along with my hospital documents and made rounds again and again. Only then the shop could be reopened.

4.3.4 Grievances of the dealers

In general, the shop owners had two important grievances. One was regarding the quality and quantity of rations they received. ‘Sometimes the quality of the ration is very bad, but we cannot do anything about it. We distribute what we get’ (05L06). One owner (05L01) said, ‘These people [from the Department of Food and Supplies] should take back their bad quality (*ganda maal*) stuff. When they don’t take it back, we end up mixing the bad quality with the better quality and distribute it. What else to do?’ One respondent (05L02) shared that when there were discrepancies in the quantity of ration, they complained to the department and at times, when no action was taken, he had to fulfil the quota personally. The same respondent said that the workers who accompanied the rations from the godown would make tears in the sacks with a knife and pilfer small amounts from each of the sacks.⁴⁹ However, he did not reveal what another owner (06L01) had said: that if the owner suspected a problem with the weight, he could weigh it while offloading. If the weight of the commodities received was less than the stipulated amount, then the dealer could record the weight that he received in the Receiving Paper and inform the department.

The other grievance was about their remuneration/income. One (05L06) said, ‘Running the shop is not profitable.’ In the past, PDS dealers’ commission was very low (70 paise per kg of ration distributed), but a few years ago it had been increased to INR 2 per kg of ration. One of the owners (05L02) who has 700 cards registered in his shop, said that on an average, his monthly commission was between INR 30,000 to 35,000. His monthly rent for the shop was INR 8,000 and he employed two labourers.⁵⁰ Added to this would be money paid to labour for offloading the rations from the truck (approximately INR 1,500–2,000). If all these expenses were added up, it would indeed leave the owner with hardly any surplus, net income.

⁴⁹ ‘*Maal jab aata hai toh labour chaaku maar ke beech se har bori se thoda thoda kar ke nikal leti hai.*’

⁵⁰ The owner did not say how much he was paying the labourers but another dealer (05L05) said that, were he to employ a person to weigh the rations he would need to pay, a minimum salary of INR 10,000 to 15,000 (≈ \$ 100 to 150) monthly.

However, it was also clear that none of them would be engaged in this employment were it to be such a low-paying or a loss-making venture.

4.3.5 PDS dealers, a powerful lobby

The bargaining strength of the dealers can be seen from the power wielded by the PDS shop owners' association (the Delhi Sarkari Ration Dealers Sangh).⁵¹ For instance, one owner (05L01) said that during the Covid period, their commission was delayed by 4 to 5 months.⁵² The PDS shop owner's association in Delhi went on a strike and did a *dharna* (sit-in strike) outside the office of the Delhi state civil supply, after which they received their money.

The reality is that every time there was a possible threat to this system, the association had successfully lobbied to achieve its demands. For instance, in 2015, an order was issued by the department that shopkeepers over 60 years old would not be eligible for renewal of their licence, and that it would be cancelled automatically. The association was able to get the order rescinded in 2018.⁵³ According to one dealer (05L02) their current demands are:

- Ration shop owners should get a monthly fixed salary of at least 50,000.
- The salary of people employed at the ration shop should be borne by the department.
- If there are any discrepancies in the quantity of ration received from the godown, some system must be established to ensure ration shop owners receive the correct quantity of ration.

4.4 PDS in Chhattisgarh: Functioning of the ration shops

In contrast to Delhi state, in Chhattisgarh none of the FPSs is privately owned due to reforms brought about to reduce corruption at the final level

⁵¹ The Delhi Sarkari Ration Dealers Sangh (the Delhi Government Ration Dealers Association) was formed in 2014 and registered in 2018 (<https://www.dsrdshdelhi.com/>, accessed 22 June 2026).

⁵² The respondent further revealed that he had yet to receive the money for sugar distributed during the Covid period.

⁵³ See <https://www.dsrdshdelhi.com/achivements.php> for a list of the association's achievements.

of the supply chain (see Box 4.2 for the interesting history of PDS in Chhattisgarh). Currently there are 14,088 FPSs in the state.⁵⁴

The PDS entitlement for the different categories of the population is also different in Chhattisgarh state compared with Delhi state. The state has categories under the NFSA (central government) scheme as well as categories under the state government. The NFSA central government scheme supports AAY, PHH and Divyang (disabled) card holders. Under the state government there are three other categories, including the APL category.⁵⁵ These state-sponsored categories are under the Mukhya Mantri Khadyanna Sahayata Yojana⁵⁶ (MMKSY) objective of the scheme. The main objective of the scheme is ‘to distribute commodities of Public Distribution System to poor families left out from the Targeted Public Distribution System of the Central Government’, specifically ‘those Non Scheduled Caste and Non Scheduled Tribe ... Ration Card holders in rural areas, whose name exists in the BPL list prepared on the basis of survey done in the year 1991 or 1997 but does not exist in the BPL list prepared on the basis of survey done in the year 2002’ (Government of Chhattisgarh, 2007).

See Table 4.2 for the different categories and their entitlements in Chhattisgarh PDS. Since Covid, under the PMGKAY scheme, the centrally disbursed rations are given free.

⁵⁴ https://epos.cg.gov.in/dfso_fps_details, accessed 14 February 2026

⁵⁵ DI – Divyang (disabled) – a specialised category for households with head members who are differently-abled or have severe disabilities; DS – Destitute special A category for the most vulnerable and marginalised populations without societal support, such as the elderly, single women/men, scrap collectors, or particularly Vulnerable Tribal Groups’ (PVTG).

⁵⁶ Translated as ‘Chief Minister Food Assistance Scheme.’

Table 4.2
Categories of ration cards in Chhattisgarh state

Ration card type	Card colour	Target beneficiary	Core food grain allocation	Cost of grains
Antodaya Anna Yojana (AAY)	Yellow	Poorest of the poor	35 kg / family	Free
Priority households (PHH)	Red	BPL families under central NFSA criteria	5 kg/ individual	
*State antodaya anna yojana (SAAY)	Yellow	Poorest of the poor landless labourers, daily wage earners, primitive tribal groups, no stable income	35kg per card holder	Rs 1/kg
*State Priority HH (SPHH)	Red	Low-income and labourers; state-identified poorest families not covered under central AAY	35 kg / family	Rs 1 / kg
Destitute Individual (DI) (Nirashrit)	Grey	Unsupported elderly/destitute	10 kg / person	Free
Disabled spouse/single (DS) (Nishaktjan)	Black	Persons with >40% disability	10 kg / person	Rs 1 / kg
General (APL)	White	Taxpayers / middle-income	15 kg / family	Subsidised (<50% MSP)

* These are state-funded under the Chhattisgarh Food Security Act.

Source:

<https://fcs.cg.gov.in/sfc/pds.html>, accessed 24 June 2026.

[https://prsindia.org/files/bills_acts/bills_parliament/2011/Chhattisgarh Food Security Act.pdf](https://prsindia.org/files/bills_acts/bills_parliament/2011/Chhattisgarh_Food_Security_Act.pdf), accessed 24 June 2026.

https://fcs.cg.gov.in/PlanScheme_En.aspx, accessed 24 June 2026.

<https://g.indiacustomercare.com/chhattisgarh-ration-card#gsc.tab=0>, accessed 23 June 2026.

In-depth interviews were conducted with three ration shop dealers, two from the rural site and one from the slum in the town which mostly catered to labouring migrant people.

R (01L01) is the dealer for two ration shops that cater to villages inside the forest area. His shop has been functional since 2016, under a women's self-help group. To be eligible to apply for this role, a group must be at least 3–4 years old. To apply for the licence, the dealer has to be proposed by the gram panchayat (village assembly), and the consent of the women's group, formalised through a resolution passed in a meeting. The nominated dealer's

Aadhaar number is required, along with his bank account details, and the account must hold a specified amount of money. Approval is through the SDM (sub-Divisional Magistrate).

The application process was done online. At that time, he was ‘unemployed’ and was into farming. Since he is educated, the people in the village told him that he should do this as it would fetch more income. The group gets INR 12,000 annually @ 30 paise per kilo of grains. All transport, loading and unloading costs are borne by the government.

He oversees two shops in two different village panchayats, providing for five villages and catering to approximately 1,200+ ration card holders. To help with the work, he employs three or four labourers, which, he says, is partly to help others and that ‘in between, if something good/bad happens in the village, I give it [rice] there. It also feels good to help others.’⁵⁷ The allotted PDS rice comes regularly at the end of a month and is distributed in the first two or three days of the month. Occasionally someone comes later than this, in which case they are still assured of getting it.

Sometimes he incurs losses because the rice gets spoilt in the rain, and sometimes the rice that is sent from the godown itself is already spoilt. In the latter case, ‘We have to send it back again. We get it written from Sir that we are from inside the jungle area and that there are problems here and spoilt rice has been sent. That is taken back immediately. At times, even that is returned.’ If rice gets spoilt in his shop he dries it under the sun, washes it and dries it again, often with the help of others in the village. Sometimes the weight he receives is less than what he says is recorded as sent. In such cases he is forced to supplement from his own resources by purchasing additional rice.

During Corona time, rice was given free, but according to him the scheme has no longer been operating for the last two and a half years (since 2023).⁵⁸

He gets a monthly salary of INR 6,000 (@ 30 paise per kg). The central government had increased it to 90 paise some three to four years before, but, although the order was released, the dealers did not receive the additional sum. He pointed out that a critical problem was that the district-level authorities demanded large ‘commission’ (bribes) from the dealers. Even

⁵⁷ ‘Good or bad’ could be festivals, funeral feasts, etc.

⁵⁸ This is not accurate because the supply of free rations from central government has been extended till January 2029.

though, during one of their protests, the shop owners received an assurance from the administration that they will not be asked for the commission, there was still pressure to pay, with each one of the functionaries pointing to another in the administration. For the last nine months he had not received his income and though he was going 'bankrupt' he was continuing with the work.

He places the order for rice and other commodities required for the month online, but it is distributed offline in these villages. This is because the network is difficult to access in this area, deep within the forest. Distribution to card holders is done without scanning thumbprints and is given based on a paper register and ration card only. To place the order online, the dealer has to go to a town where he can access the network. According to him, 'Sometimes everything goes wrong. Then, we have to call up NIC [the National Informatics Centre]. Then, it is being re-done again from Raipur.' Because authentication is not required, he said:

Fingerprint scanning is not our problem. Our problem is the server. The server does not respond online. Sometimes, for two–three days, it continues [to not respond]. The main problem is that whenever we have to go online, the server does not load. At times, the stock does not show negative, it keeps fluctuating up and down. In my last four months of distribution, my record has become such that we had to buy 20 quintals of rice and give rice to everyone. Now once someone has received rice, he will not return. Due to this situation, I ended up spending a lot of money. I spent 5,000 rupees [$\approx$ US\$50] out of pocket.

Currently, rice is distributed free. And those who have APL cards, for families above poverty line who have jobs, are now getting rice at Rupees 10 per kg. BPL card is for free ration and disabled people. Salt (1 kg) is free, and sugar is sold at 17 rupees per kg. At some point of time, pulses were distributed. Now, there is no such thing over here. Right now, in ——— they are giving one packet of chana [chickpea].

Sometimes there are instances wherein there is a fight within a family and the person whose fingerprints are to be scanned to avail the ration, would refuse to scan his fingerprint so that others cannot receive rice.

One of his suggestions was that people over the age of 60 should not be asked to scan fingers.

M (08L01) is the dealer in a ration shop in an urban slum. He has been working as a ration shop dealer for the last six years. He studied to become an engineer (Bachelor of Engineering) but dropped out when he could not

clear the final examination. He took up this job of dealership because of lack of employment opportunities: ‘at least it was better than doing nothing’. When a vacancy for this dealership was announced by the government, he applied for the licence through their —— cooperative committee which comprises both men and women as its members. This is the practice in urban areas, whereas in the villages it is through the panchayat. The committee oversees the functioning of the shop and comes for monthly inspection. He had approximately 1,500 beneficiary households registered but because another shop was licensed two months prior to the interview, he lost approximately 350 cards. He gets beneficiaries from two urban settlements.

Because it is an urban area he gets labouring households, both residents of the slum and temporary migrants from all over Chhattisgarh and other states such as Bihar, Uttar Pradesh, Madhya Pradesh.

Therefore, it becomes a bit of a problem by the end of the month to cater to temporary migrant households. But he is able to manage because he can send them to other shops that has stock because the shopkeepers coordinate among themselves and operate together as a team. In the end everyone gets rations except for one or two households. The dealers deposit their payment via NFT, which submits it to the FCI, and the DO (Delivery Order) is issued before the 25th of the month so the stock reaches the shop on the 25th. The dealers make a rough estimate on the number of people who might turn up and submit their requisition accordingly. Every month the requirement fluctuates.

If a new card is issued or if a beneficiary belongs to another district or state, they have to do their KYC. The last two or three months, the government has been reducing the quantity.

[In case of BPL card holders] if there are three beneficiaries covered under one ration card, and the KYC has been completed for only two of them, and it has not been done for the third person ... there will be a deduction of 15 kg rice before sending here [from the FCI]. Now once the beneficiary arrives, he would ask us: ‘Brother, we receive 35 kg of rice.’ In such cases, we first check and then explain to him that the KYC of one person in his card has not been done. And for that reason, he would receive 20 kg rice. We would tell him to check what the machine displays. And in case of APL card holders ... even if one person’s e-KYC is pending, the government stops the ration supply for their card. Now, let us assume, we are in February and your family has five members. One person’s KYC is

pending. If you get your KYC done, then you would get your ration supply from April onwards and not in March.

This practice of reducing rations due to non-KYC status has come only recently and it affects households that have members who have gone out [migrated] either for studies, work or other purpose. In some cases, it could be because of family disputes or altercations within family members. And in case of many children, if they have just reached 5 years of age and their Aadhaar is not updated and so KYC not done, the government stops their allotment. For children there is difficulty in updating fingerprints.

So, the beneficiaries are also upset by this.... Sometimes, there are some technical problems with the machines. There are times when we have done the KYC on the machine from here, but it has not been updated online. For that reason also, the ration supply has been stopped. We show them on the machine that we have completed their KYC. We explain to them that although they can see that their KYC is completed, still it is not showing online. [To resolve] such cases are not in our hands. It is at the discretion of Food Office. We send such cases over there.... At every shop the beneficiary is facing some problem or the other.... At times it is resolved fast [at the FCI]. Or it might take longer as it is also crowded over there.

When he began work six years ago the dealers were supplied with a tablet where authentication was done by photographing the face. About a year ago, the ePOS machine arrived where fingerprints had to be authenticated. Initially it was a big machine but now it is smaller in size. They were instructed to distribute 70% via the ePOS and the rest otherwise, as it kept updating. There were no problems when the tablet was used. However, he is now experienced enough with the ePOS to distribute rations to almost 150 card holders in a day.

According to him, the major problem with the present system is that:

over here we mostly have labourers. They are mostly regular customers. There is a lot of problem with getting the fingerprints scanned. Now this ePOS machine will not work properly if you do not use clean fingers ... we explore every possible way: by washing their hands or by applying something and try to get their fingerprints/thumb impression scanned. It takes a lot of time and at times it might take almost half an hour for just one person.

Q: And what if ... these efforts fail?

Response: Then they will not receive their ration supplies.... Then there is no other option left.

Q: And roughly, on a monthly basis, how many such people would be left out like this?

M: There is one such beneficiary over here at my shop, who is approximately 80 years old.... He is not even literate and hails from a very poor background ...

Q: So, he doesn't receive his ration from here?

M: No.

Q: So, how does he eat? Does he purchase from outside?

Response: Yes, he purchases from outside.

Although OTP was an option, the dealer said that it was really not an option because there were many poor people who were without a mobile and, even if they had one, they were not able to keep it charged.

Chhattisgarh PDS has schemes under both the central government's NFSA and the state-specific Chhattisgarh FSA. When migrants come from outside the state, the 'machine' shows only the items under the central government. But within Chhattisgarh, too, the state has made two kinds of provisions where one is a 'state' card and the other combines both central and state government. If the resident of Chhattisgarh has only the 'state' card, s/he will not get any benefits if they go outside the state. This pertains to those in the APL category as the central government does not recognise this category. If the person has a BPL card, if they migrate outside the state, they will receive only that part which comes under the central government provision. And because 'nothing is written on the ration card', the beneficiary has little knowledge as to what they are entitled to under these two provisions. 'It [rations] depends on whether or not it shows up on the machine.' Recently, the Chhattisgarh government had promised to give two months rations 'at one go'. But 'all are not receiving it.... Those under the state system, who receive sugar, rice, and salt at the same time, only they are receiving two months' supplies.' The others were not receiving it because, according to the dealer, the warehouse was out of stock. The officials told the dealers that they should go by 'whatever the machine shows'. However:

Many beneficiaries, many people accuse us. They raise the question that while the government has spoken of two months' ration everywhere, why aren't we following that instruction? ... we show them, through scanning fingerprints, how it does not happen. But still, after all they come from villages ... [they say] we are taking away their one month's share. This

issue is cropping up now.... Had this information been shared via news channels or newspapers, that the government is distributing one or two months' supply only for the Chhattisgarh beneficiaries and not to those under the central government scheme, then it would have been much easier for us.

The transportation cost is borne by the government. Rice, salt and sugar are distributed to the beneficiaries. The government provides INR 90 per quintal for the central government share, and INR 30 per quintal for the state allocation.

If we receive 100 quintals of goods from the centre, then at the rate of Rs 90 per quintal, it sums up to Rs 9,000. If we receive 200 quintals from the state, then it sums up to Rs 6,000. We are doing the work equally. We are weighing and providing 1 quintal from the centre's share and likewise weighing and distributing 1 quintal from the state's share.... Also, there is one more thing about that ePoS. Since 2022, we are supposed to receive [monthly] Rs 21 per quintal from the central government to run ePoS services. But the [Chhattisgarh] government has withheld it ... at times we are operating it [ePOS machine] by either connecting to our mobile or to our Wi-Fi ... when their [the department's] internet does not work.

Since 2022, the dealers have also been demanding that the state government increase the commission of INR 30 per quintal, which was set in the year 2003. The dealers went to Delhi and went on strike, but it was not raised. Moreover, unlike the rural areas, where the dealers could use buildings belonging to the panchayat to distribute the rations, in urban areas the dealers have to rent out shops which could cost anything from INR 8,000–10,000 ($\approx$ US\$80–100) per month.

Let's go by a tentative estimate. Let us assume that a ration shop has around 1,000 card-holding beneficiaries. For them, you would at the most receive around 250 quintals. Out of the 250 quintals, 70–80 quintals will come from the central NFS quota, and the remaining will come from the state quota. So, that much doesn't work out. Now look, we are managing things amidst problems. At times, I feel like simply leaving this work altogether.

The dealers' greatest fear is the introduction of grain ATM machines or shifting to cash disbursement through DBT. With these policies in the pipeline, they fear that they will become unemployed in a few years' time. While the ATM machines may not work in rural areas, the respondent felt that it might become a success because of the 24 hours window and because the beneficiary can get their rations any time of the day or night. 'But just as

the bank server is also down at times, likewise, this machine's server might also be down.... That's the problem. To whom will they talk? Now, they will go to the Food Office. There is nowhere else to go.

See Annex 3 on the stand taken by the All India Fair Price Shop Dealers' Federation (AIFPSDF) on the DBT matter.

Box 4.2

History of PDS in Chhattisgarh state

On 1 November 2000, the state of Chhattisgarh was formed from the state of Madhya Pradesh. Initially, the state government gave licences to private owners to operate the PDS shops. However, there were many complaints of corruption against these owners, which were investigated by the State Advisor for the Supreme Court (Krishnamurthy et al., 2014). In 2004, following the committee's recommendations, a Public Distribution (Control) Order was passed cancelling all private ownerships (Krishnamurthy et al., 2014). From then on, the FPSs have been operated by gram panchayats, cooperative societies, self-help groups, and forest protection committees (Krishnamurthy et al., 2014).

The following are some of the key reforms in Chhattisgarh PDS (Misra, 2010: n.p.)

1. Expanded reach: Ownership of PDS shops given to local community-owned bodies, price of rice reduced to Rs 1 per kg for the poorest of the poor, and shops opened throughout the month.
2. Expanded number of beneficiaries: to 74% of households as against the central government mandated 42%.
3. Better vigilance.
4. Improved economic viability: the shopkeeper's commission was increased from Rs 8 per quintal to Rs 44 per quintal.

In addition to this, Chhattisgarh adopted the DCP system for procurement of grains directly from its farmers (Krishnamurthy et al., 2014).

In 2012, Chhattisgarh passed the Food Security Act even prior to the National Food Security Act of 2013.

(See:

https://prsindia.org/files/bills_acts/bills_parliament/2011/Chhattisgarh_Food_Security_Act.pdf, accessed 8 June 2026).

4.5 Comparing experience of PDS in Delhi and Chhattisgarh

It is clear from the above narratives that the dealers in Delhi, particularly in the urban field site, experienced the introduction of digitalisation positively. Digitalisation reduced the drudgery of maintaining physical records and saved on time for both the dealer and the beneficiary. There were few issues with connectivity or authentication as the beneficiaries in the urban sites could approach any of the shops in the vicinity to access rations. This was in direct contrast to the narratives of the dealers in the Chhattisgarh field sites, for whom connectivity and authentication posed problems. Moreover, since Chhattisgarh had both the nationally sponsored and state-sponsored PDS schemes, the time spent on authentication doubled if beneficiaries were receiving rations from both schemes. Dealers from both states complained about the low remuneration they received for their services, although, for the dealers in Delhi sites, ration distribution did not appear to be their major source of income whereas for the dealers in Chhattisgarh it was. In both states they had formed powerful organisations lobbying effectively on issues concerning them, particularly remuneration and the introduction of cash through DBT rather than grains.

While this section focused on the PDS dealers, the next section will explore the experiences and perceptions of the beneficiaries from the field sites in both Delhi and Chhattisgarh.

4.6 The beneficiaries: Ration card holders

This section looks at the experiences and perceptions of the beneficiaries from both Delhi and Chhattisgarh field sites. Data for this comes from the household and in-depth surveys. We look at the issues in converting paper ration cards into digital ones, problems in accessing rations, inclusion/exclusion errors, the quality of rations provided and the contribution to the food basket of the households, and therefore the savings accrued.

In the household survey (Delhi state), of the 61 households surveyed with a structured questionnaire, 45 possessed a ration card and in Chhattisgarh state, of the 71 households surveyed, 66 possessed a ration card with 41 AAY, 18 BPL, and 6 APL categories; one household that was eligible did not have a ration card because they did not possess an Aadhaar card.

4.6.1 Digitalising a paper ration card

Most of the respondents from Delhi state either could not recall or did not have a problem changing from paper to a digital record. However, the in-depth interviews brought out some major issues for a small number of the respondents. The following three short accounts illustrate the different problems beneficiaries faced while shifting to a digital card.

1. Delay of more than four years in getting a card

In 2021, approximately four years before the survey, AK (06R04), a migrant resident in the rural field site (Delhi) had removed his name from his father's (family) card and had applied for a separate card in his village for his family, comprising his wife and daughter. However, it was only the previous month that he was informed by the panchayat secretary of his village that his card had been issued and that he should come with his family and get his KYC done to activate it. Since this was the peak agricultural season, he could not visit his village and hoped to go in a month or two when work reduced. Although his family is on the list of poor households, because he has had no ration card for all these years, he has had to purchase everything from the open market.

2. Problem linked to mobile and OTPs

P (05R11) family in the resettlement colony in Delhi had applied for a ration card in 2019. Some officials came to their house for enquiries and approved their application. Soon after this, the Covid lockdown was imposed and the husband had no work. For nearly two years after that he had very little work and so stopped charging his phone and it had stopped working. He did not know that the number had been deactivated because of that. After lockdown, they again pursued their application for the ration card. The officials said that an OTP had been sent to their phone number that was registered on the application form. They called the number and found that it now belonged to a person from Punjab. But this person refused to divulge the OTP number as he thought he would become a victim of digital fraud and that they might remove money from his bank account. The respondent's family then had to register another phone number in their application. They finally received their ration card in November/December 2024.

3. Problem linked to clerical error

S (05R12) belongs to an eligible BPL household that does not have a ration card. This was despite trying several times. The first time they applied, they got a ration card, but the government officials had not put a stamp on

it.⁵⁹ So the ration shop dealer would not accept it. The second time, around 3–4 years before, they had approached a *dalal* (middleman) to get the ration card stamped. He charged INR 2,000 in total (approximately €25 at the then exchange rate). The *dalal* said that it might take 5, 10 or even more years and if they wished they can make a fresh application.⁶⁰ Last year, for the third time, they went to a different *dalal* who said, ‘First you need to cancel the existing ration card from the SDM [sub-Divisional Magistrate] office – only then, a new one can be made. Due to all these issues, we still could not get our ration card.’⁶¹

Repeated KYC verification was reported to be a problem, particularly for migrants living in Delhi state who had to leave work in Delhi and travel with all their family members to their native village. This meant loss of wages and money spent on transport. In some situations, it still did not result in full success.

HR (06R06) is a migrant worker residing in the rural field site in Delhi. The family was denied rations because of the Delhi government’s order to complete e-KYC. Hence, the entire family (six members) went to their village to complete e-KYC. After returning to their residence in Delhi state, when the respondent went to collect his rations, the ration shop dealer told him to come with all his family members for verification. However, the fingerprints of two of his family members (both children) could not be authenticated. This was because, according to the respondent, their Aadhaar card had been made based on iris scans only. The dealer gave rations for the four members who could be authenticated but refused to give rations to the other two. The dealer told him that only if the respondent updated the two children’s fingerprints, will they get their rations.

In contrast to the Delhi state field sites, almost 90% of the respondents from Chhattisgarh reported a problem when the paper card was digitalised. See Table 4.3 for the different problems faced by the respondents.

⁵⁹ ‘*woh ration card tha, par usme Sarkari mohar nahi laga tha. Tho dukaan se ration nahi milta tha.*’

⁶⁰ ‘*Paanch saal, dash saal, mano pandra saal bhi lag sakta hain. Chao toh dubara apply kar sakte ho.*’

⁶¹ ‘*Dalal ka kehna hain pehle abhi ka ration card SDM office se katam karwake lao - Phir naya ban sakhta hain. Is chakkar mein hamara ration card nehi baan pa raha hain.*’

Table 4.3
Problems faced while digitalising ration cards
(Chhattisgarh field sites)

Description of problem	n	%
Updating Aadhaar card and linking fingerprints, frequent visits to different offices for ‘this and that’, for including all family members; loss of wages	29	43.9
Mobile update, had to buy new phone, took another's number, server problem, OTP issue	19	28.8
Had to collect, update documents, frequent visits for collecting documents	5	7.6
Adding name to ration card, KYC	2	3.0
Had to bribe someone	1	1.5
No problems	7	10.6
NA	3	4.5
Total	66	100

Since most of the respondents in Chhattisgarh field sites were from rural areas, some living in quite remote villages, including inside the forest area, frequent visits to towns for submitting documents, registering and updating meant loss of wages and expenditure on transport, and a prolonged sense of uncertainty and anxiety. The second major problem for this group of respondents was due to mobile and connectivity issues.

Aside from these, money had to be spent on photocopying documents and paying ‘choice centres’ or Customer Service Points to upload documents on the specified online portals. One respondent (03R02) said that he had to pay INR 2,000 to the sarpanch (elected village chief) to get his digital ration card made.

4.6.2 Problems in accessing rations

In the Delhi field sites, 6 of the 45 households with a card, all from the rural site, could not access rations regularly because they could not go on the assigned days to collect rations due to work. This problem did not exist in the urban site, where there were multiple ration shops to go to.

In the Delhi sites, the respondents from urban areas complained that even though the shops were close to their homes, they had to wait (standing) in long queues for more than two hours. For those who were from the rural site (Delhi), since the shop catered to two villages, people from the distant village had to spend almost half a day walking to and from the shop and waiting in a queue which meant the loss of a day’s wage.

In contrast, in the Chhattisgarh field sites, all 66 respondents said that they accessed rations every month. This was despite spending considerable time and money every month. See Table 4.4 for time and money spent by respondents from rural areas in Chhattisgarh.

Table 4.4
Cost (time and money) in accessing monthly ration Chhattisgarh field sites

Money spent			Time spent		
Category	n	%	Category	n	%
No expense, in the same village or close, get on foot	17	25.7	< 4 hours	17	25.7
INR 1–50	31	46.9	4 to 6 hours	3	4.5
INR 51–100	14	21.2	1 day	5	7.5
INR 150–300	3	4.5	1-2 days	37	56.0
Someone’s motorbike	1	1.5	> 2 days	4	6.0
Total	66			66	

Table 4.5 shows that almost 75% of the respondents in the Chhattisgarh field sites had to spend money and time on accessing rations, with more than half of them spending one or more days, forgoing their wages. Generally, if the shop was close to their residence, the women or children of the households collected their rations. Otherwise, it was the men who would take a public transport or go on motorbikes to the ration shops.

In areas outside the forest, where scanning of fingerprints was mandatory, 28 (42%) respondents stated that they had difficulties in finger/iris authentication. Twenty (30%) respondents said that they were denied rations at one time or the other for reasons of not updating through KYC.

4.6.3 Exclusion and inclusion errors

Even in the small sample size in our study, exclusion and inclusion errors could be discerned. The case of S (05R12) described in the previous section is one case of an exclusion error where an eligible BPL household was unable to access rations because of a clerical error that could not be rectified. The irony is that they had probably been categorised as a non-existent ‘ghost’ beneficiary household because they had not accessed their rations from the time their card was made several years ago.

Several households reported that at times it was near impossible to get the names of all the members of a family (particularly the children) entered into the ration card, even if they possessed an Aadhaar card, because they all had

to be present for KYC verification. This was true for all the field sites in the two states.

For instance, only three members of the J family (06R07) from the Delhi rural field site were registered in the ration card. Later, they applied in offline mode to add the names of their two children. It took one and a half years to complete this process. It could be done only because they got the help of the local ward member and the MLA (Member of the Legislative Assembly, an elected leader).

A particular problem was with regard to daughters-in-law when they left their natal home and joined their marital homes after marriage, the norm in much of India. Women in a FGD held in the urban field site (Delhi, 19 May 2025) said that while they got their names removed from the ration cards in their natal homes, it took quite a while to get their names added in the cards of their marital homes. A few of them also said that, at present it was not at all easy to add new names to a ration card.

There was an instance of one clear inclusion ‘error’ in the rural field site (Delhi).

D (06R01) household has been receiving the PDS ration for the past 30 years. They own more than 6 acres of land and possess a car and a motorcycle. Despite these assets, the head of the household is a beneficiary of the PDS. He is a respected and politically active member of the village, which has made him well known to the local MLA and ward member. So it was easy for him to get a ration card issued. Every month, the family collect their ration from the PDS shop. They said that when the grain is of bad quality, the family would mix it with other grains like pearl millet, sorghum and chickpea.⁶² They prefer wheat over rice and so they request the dealer to give them only wheat and he obliges them at times. Owing to their good relations with the dealer, he calls him on the day when there is less crowd in the shop to pick up their rations.

One respondent (05R01) admitted in a whisper that her dead husband’s name was still on the ration card.

A point to be noted is that of the two ‘inclusion’ errors in the examples given above it is the second that has been written about in the literature. Little attention is paid to elite capture, which digitalisation cannot eliminate

⁶² This was not quite believable because it is a wealthy household. However we appreciate the fact that the respondent told the interviewer that they possessed a ration card well knowing that they were participating in a study.

because they are adept at manipulating the system. Moreover, between the two inclusion errors, for the woman the inclusion of her dead husband's name on the ration card was essential for survival as she was now old and single whereas for the landowner it was just an exercise in power for accessing state benefits that they were not entitled to.

4.6.4 Quantity and quality of PDS grains

Digitalisation did not appear to provide accurate measure of grains or improve the quality of grains for the beneficiary.

‘कहावत है की दान में गाय का पंडित दाँत नहीं गिनता’

Translation: There is a proverb that a learned person does not count the teeth of a cow that has been gifted.⁶³ (J, 06R07)

The above quote is from respondent J (06R07) from the urban field site (Delhi). While the respondents from the Chhattisgarh sites did not complain about the quantity of the grains they received, there were several complaints from the respondents from the Delhi field sites.

HR (06): [the] weight is not the same every month. Full weight is given only two or three times in a year. Usually, we get 2 kilos less than 30 kg.

A (06R06): The dealer in the first shop he was registered with behaved rudely and consistently provided less than the mandated quantity. There was also a problem regarding timing. The dealer would ask them to stand in queue at 7 o'clock in the morning and he himself would come at 9 o'clock to distribute the ration. Often, the rationed grain was mixed with gravel, stones, and agricultural waste. Sometimes the grain was so bad that they could not consume it themselves and would feed it to their animals. When the respondent complained to the FSO [Food Security Officer] about the poor quality and low weight of the grain, the officer replied that the PDS dealer was not responsible, as the grain-supplying department was a separate entity. Because of that, the PDS dealer could not be held accountable for the grain's quality. The FSO assured the respondent that the matter would be brought to the attention of the relevant department and that efforts would be made to distribute fresh grain. When this continued for several times and no action was taken on the complaint, the respondent applied to attach his card to another PDS shop. The FSO asked him to write an application with copies of the ration card, Aadhaar of all members and residential proof (voter ID card and electricity bill). Finally, his card

⁶³ Equivalent to the saying ‘Don’t look at a gift horse in the mouth’.

was transferred to another PDS shop. He found the grain at the new dealer comparatively fresh and clean.

The quality of the PDS grains came up in an FGD (all males) held in the urban field centre of Delhi (18 May 2025) as well. One of the participants said that in the past, he had worked as a labourer in a ration shop for many years and that before the digital system, a lot of ration embezzlement and adulteration would happen. Due to the digital record keeping through ePoS machines, he said it did not happen any more. ‘When I used to work in the ration shop as a helper, the ration shop owner asked me to mix bad grain with good grain. All ration shops were equally responsible for these malpractices, and all are participating in this sin.’⁶⁴ The other participants countered that adulteration of ration still happened but had somewhat reduced from before. They often found that after collecting the ration from PDS shops, when they went to the *chakki* (flour grinding) shops to grind the wheat grain, they would find that at least 1–2 kilos of the ration was *kankad* (small stones/grit).

Once, respondent R (05R09) said she found a dead rat in her wheat *bori* (sack). ‘a dead rat came out; I got very scared. After that I have never been sure about the quality of the wheat. Therefore, at times I buy from another shop that is in front of this [ration shop].’⁶⁵

4.6.5 PDS and household savings

The PDS is touted as the world’s largest food security net. In order to assess its contribution to the food basket of an eligible household and thereby assess savings incurred, data was collected on household monthly spending in varied types of households.

Except for a few, all households with a ration card that had accessed rations consumed the PDS grains. While in Chhattisgarh only rice, the main cereal consumed, was distributed, in Delhi state both wheat and rice were distributed mandatorily. Therefore, in Delhi, many households whose food culture did not include rice, would then exchange it at the ration shop for wheat, or sell it and purchase wheat. For those households that consumed rice as part of their food culture, they preferred parboiled rice whereas the

⁶⁴ ‘Hum jab kaam karte the, maalik bolta tha milavat kardo. Sabh karte the, paap ke bhagidaari sabh hain.’

⁶⁵ ‘Chuha nikla mara hua mai dar gyi bahut., pta nhi kaise gheun hoga, ... ji ki dukan hai us k saamne hi chakki se de ke dusra ka atta le leti hu kabhi.’

PDS supplied raw rice. So, these households too ended up selling their allotted rice to purchase parboiled rice from the open market.

The PDS commodities for the PHH and AAY households are meant to be important safety nets. However, 39 out of 45 (87%) in Delhi field sites and 38 out of 66 (58%) in the Chhattisgarh field sites found it inadequate to meet their household's need even in terms of cereals. The reason for the higher proportion of respondents in Chhattisgarh who said it was adequate was because many of them belonged to the PVTG community and were included in the AAY scheme of the Chhattisgarh PDS and received 35 kg of rice, irrespective of the number of family members.

Many of the households, found the quantity of grains they received quite inadequate to meet their family's needs. Households in rural areas that owned even a little farmland, supplemented the PDS grain quantity with the produce from their farm. This was true even for small farmers and some proportion of marginal farmers in the study villages. For the others who did not own farmland, the rest of their food had to be purchased from the open market. At the minimum, all had to purchase lentils, cooking oil, spices, and vegetables since none of these were distributed through PDS. Households in the villages in forest area also gathered wild food, supplemented by fishing if permitted, and those who kept chickens could add eggs and meat to their diet. In most households, a considerable amount of money had to be spent on fuel (either cooking gas or firewood).⁶⁶

For the PHH, each member is entitled to 5 kg of cereal, which means a monthly per capita subsidy of INR 100 to 125; in effect, for a family of five, it provides cereal worth INR 500 to 625 per month which is less than one day's minimum wage of an unskilled labourer in Delhi (which is INR 710) and equal to two days wage for a farm labour in Chhattisgarh (INR 312/day). To explore the role PDS played in households' food requirement, data was collected on the monthly expenditure on food that was purchased from outside. Table 4.5 gives the monthly expenditure on food and cooking fuel of some of the households in the study.

⁶⁶ In May 2016, the government launched the Pradhan Mantri Ujjwala Yojana (Prime Minister's Lightening Scheme) in which BPL households were to get a deposit-free cooking gas (Liquid Petroleum Gas) connections with refill subsidies. Although many respondents in the survey did get such a connection, almost all of them were not using it for several reasons, one being its recurrent cost.

Table 4.5
Monthly expenditure on food and cooking fuel
(Delhi and Chhattisgarh field sites)

	Delhi state		Chhattisgarh state	
	Rural	Urban	Rural	Urban
Respondent code	06R04	05R08	02R01	07R01
From PDS (kg)	None	PHH	AAY	PHH
*wheat kg		3		
**rice kg		2	35	35
***sugar kg			1	1
****salt packet				2
Chana (chickpeas)				
Savings from PDS		100 to 150	900	940
From open market (in Rupees)				
^ Aata	630	100		280
rice	480	280		630
dal	650	25	160	300
oil	480	65	140	640
salt	60	0		
sugar	172	0		117
masala	800	0	200	200
vegetables	400	450		400
fruits	800			400
milk	2520			0
eggs				100
non-vegetarian				700
others	1500			0
^^LPG cylinder	720–810	426		600
Total expenditure	9302	1,346	500	4367
Family size				
adults	2	1	2	2
children	2		1	1

* @ INR 25/kg

**@ INR 25/kg

***@ INR 40/kg

****@ INR 20/kg

^ Aata: wheat flour; households buy wheat flour while purchasing from the market, whereas PDS provides wheat grains that need to be ground into flour by paying a private miller.

^^LPG: Liquid Petroleum Gas. There is a subsidy scheme from the government which only very few receive.

Table 4.5 shows that, except in cases of AAY cards, savings from PDS did not appear to be significant. For a family of four that holds a PHH card, it would mean receiving 20 kg of cereal (rice and wheat or rice) amounting to INR 500, which is less than a day's wage. This is particularly the case when, as in the rural areas of Chhattisgarh considerable time and money is spent in accessing it (see Table 4.5). The question is why people feel that all the trouble of accessing it is worth it.

4.7 Concluding remarks

This chapter examined the experiences and perceptions of both the ration shop dealers and the beneficiaries from field sites in both Delhi and Chhattisgarh. Digitalisation appeared to be of benefit to both the dealers and the beneficiaries in the urban site of Delhi, mostly because of the large number of ration shops in the locality due to the urban concentration of population. The rural–urban divide could be seen here clearly because one shop catered to two villages in the study area, with people from the distant villages having to spend time and energy walking some distance to reach the shop. With many shops to choose from, the urban population was not dependent on any one shopkeeper and could change to another shop if they faced any problem in authentication, accessing rations or the behaviour of the shop keeper, which was not possible in the rural area.

In contrast, the experiences of both the shopkeepers and beneficiaries was largely negative in the field sites of Chhattisgarh. For the beneficiaries, it began from the time when paper cards were being digitalised. They had to incur much expense in terms of both money and time. These woes continued for them even later, in terms of authentication and network/server-related connectivity problems.

There was also an important difference between the two areas related to the quantity and quality of the rations. There were many complaints regarding this in the Delhi sites (both rural and urban). The implication was that there was continued ‘leakage’ despite digitalisation working quite well, whereas these complaints were rare in the Chhattisgarh field sites. The major reason for this could be that all the Delhi ration shops were privately owned, with little community control or supervision. In the case of Chhattisgarh ownership was with the local community bodies, such a women’s self-help group, which indicated that there was a functioning accountability mechanism. Thus, it could be concluded that digitalisation, on its own, may not lead to better accountability.

Although it could be seen that the monthly savings to the household due to the PDS were not remarkable, in both states the beneficiaries continued to access it, despite costs in terms of time and money. One major reason for this was that if, for some reason, they defaulted in accessing rations for more than three months, there was a high possibility that their card would become delegitimised and they would become the owners of a ‘ghost’ card.

5. Smart and precision agriculture

5.1. Introduction

In addition to the digitisation of land records and the use of digital technologies in the procurement and distribution of grains, digital technology is being ushered in to advise farmers on smart and precision agriculture, which includes advice on inputs, soil health, weather forecasts and recommendations for which crops should be sown at what time (Kaka et al., 2019).

Direct applications of digital technology include remote sensing (via satellites), geographic information systems, crop and soil health monitoring, and livestock and farm management, among other applications. At the pre-harvest stage, digital technology can recommend crop and input selection and assist in obtaining credit and insurance. At the on-farm stage, there is need for weather advisories and disease- and pest-related assistance; and at the post-harvest stage, real-time data on both domestic and export markets are needed. The growth of competitive markets and demand for consistent food quality is making the adoption of such tech-based solutions imperative for the Indian farmer. Much of the scope for application and innovation remains to be exploited. The application of digital technology in agriculture has been instrumental in promoting data generation as well as the advanced analytics that allow farmers to make smart decisions about farming and to benefit from an economical use of inputs and labour. (Seth and Ganguly, 2017: 105)

These digital technologies promise to enhance productivity, reduce input costs, improve market access, and strengthen decision making among small and marginal farmers. Policy guidance positions national Digital Public Infrastructure (DPI) initiatives, including AgriStack and related systems, as foundational for scaling up AI-driven agriculture (National Academy of Agricultural Sciences, 2024). The World Economic Forum (WEF) playbook (World Economic Forum, 2025) and related policy literature emphasise that scaling up AI in agriculture requires robust data ecosystems (soil, weather, satellite, and market data), validation sandboxes, integrated extension systems, and end-to-end value chain integration rather than isolated pilots.

The International Institute for Management Development (IMD) ‘Winning with AI’ framework distinguishes between adoption – the initial introduction of technology – and absorption, defined as the integration of

technology into organisational and ecosystem workflows (Wade and Joshi, 2025). Successful AI implementation depends on complementary capabilities, institutional continuity, skills development, and workflow redesign. In agricultural contexts this is particularly important, as sustained outcomes require alignment between technological tools, extension systems, and farmer practices. The literature further emphasises human–machine collaboration, iterative learning, and people-centred design approaches (World Economic Forum, 2023).

However, the empirical data from Chhattisgarh shows that the small and marginal farmers in our study did not adopt any of the smart or precision technologies that are being promoted. This includes even a simple technology such as the use of drones, popularised by the Namo Drone Didi programme (‘Didi’ translates as ‘elder sister’).⁶⁷ This is a centrally sponsored scheme named after the current Prime Minister Narendra Modi that trains women from self-help groups in the villages in operating drones for agricultural spraying. However, these services were utilised only by medium or large farmers. The small and marginal farmers continued the practice of manual or mechanical spraying methods as they found the use of drones not cost effective. (see Annex 5 for an interview with a Namo Drone Didi).

In fact, a literature search showed that in India there has been only one successful experiment in the adoption of smart technologies among smallholders. In 2022, the Saagu Baagu project (translated as ‘agricultural advancement’) was initiated in the state of Telangana on a pilot basis. Following its documented success, a second phase was to start in 2023.⁶⁸ From all accounts the second phase was not launched as planned. The following section examines the operationalisation of Saagu Baagu to understand factors that led to its success among smallholders and the reasons why this successful experiment was not scaled up.

⁶⁷ <https://www.india.gov.in/spotlight/details/namo-drone-didi>, accessed 2 June 2026.

⁶⁸ <https://initiatives.weforum.org/ai4ai/home>, accessed 5 June 2026.

5.2 Saagu Baagu: A case study⁶⁹

5.2.1 Introduction

Saagu Baagu is not just a project; it's a testament to the potential of AI in agriculture.... In a world where the synergy between technology and agriculture is proving to be a game-changer [sic], Saagu Baagu stands tall as a shining example of what's possible when innovation meets the field. The future of farming is unfolding, and AI is steering the plough towards prosperity for farmers worldwide. (Mishra, 2024)

In 2021, the state of Telangana, in collaboration with C4IR (Centre for the 4th Industrial Revolution) India,⁷⁰ in partnership with the WEF's Artificial Intelligence for Agriculture Innovation (AI4AI) initiative, and the Bill and Melinda Gates Foundation, launched the project Saagu Baagu (World Economic Forum, n.d.). From May 2022 to March 2023, the pilot phase was implemented in Khammam district covering 7,000 farmers growing chilli as a cash crop (World Economic Forum, n.d.). Telangana is one of the major chilli-producing area in the country and Khammam is one of the major chilli-growing districts in it (Daga, 2023). Around this time, chilli-production had also received an added boost as farmers had shifted from cotton to chilli cultivation due to favourable weather conditions and because of the 'government's recommendation to shun cotton and instead plant alternative crops' (Daga, 2023).

Public narratives, at both national and global levels, have portrayed Saagu Baagu as a flagship digital agriculture success, citing improved yields, reductions in pesticide use, and higher price realisation (Krishi Jagran, 2024; Niti Aayog and Niti Frontier Tech Hub, 2025; The Hindu Business Line, 2023; World Bank Group et al., n.d.; World Economic Forum, 2023). It was reported that there was 'an average increase of Rs 1,870 per 100kg (\$22.86/100kg) in sales when compared to traditional channels, with savings on commissions, transportation and packaging and the enablement of transparent pricing' (World Economic Forum, 2023: 10).

The pilot took 18 months and three crop cycles to complete. During this time, farmers reported a remarkable surge in net income: \$800 per acre in a single crop cycle (6 months), effectively double the average income. The digital advisory services contributed to a 21% increase in chili yield

⁶⁹ Empirical data presented in this section was collected by Pratheep Purushothaman who also co-authored the section.

⁷⁰ <https://initiatives.weforum.org/4ir-network/c4ir-india>, accessed 9 June 2026.

production per acre. Pesticide use fell by 9% and fertilizers dropped by 5%, while quality improvements boosted unit prices by 8%. (Jurgens and Kaushik, 2024: n.p.)⁷¹

A post-pilot study concluded that Saagu Baagu offers a scalable and replicable model for digitally enabled agricultural transformation. Overall, the initiative stands as a blueprint for inclusive, sustainable, and ecosystem-driven agricultural development in India and beyond (Reddy et al. 2026: 485).

Thus, from the above accounts, the first phase of Saagu Baagu was an undeniable success and in 2023, the Telangana government invited tenders for implementing the second phase through an Expression of Interest (EoI) for covering 500,000 farmers in 10 districts of the state in 5 value chains (Telangana State Technology Services, 2023). However, following this announcement there was no further information on Phase 2.

This part of the study attempts to understand the factors that led to the success of the programme whose central objective was to deploy digital technologies to boost the income of small and marginal farmers and the reasons why success did not lead to its scaling up.

5.2.2 Phase 1: The pilot phase

Phase 1 of Saagu Baagu extended from May 2022 to March 2023 and was led by Digital Green (DG)⁷² in partnership with AgNext,⁷³ and

⁷¹ According to Jurgens and Kaushik (2024), the pilot was for 18 months. However, according the WEF (2023), the pilot was for only for 11 months (May 2022 to March 2023).

⁷² Digital Green is ‘a nonprofit organization ... subsist[ing] on the generosity of others, including government partners and donors’, <https://digitalgreen.org/>, accessed 3 June 2026. Digital Green India is ‘Farmer-first and rooted in smallholder realities, Digital Green strengthens agricultural systems through data, AI, and community partnerships, enabling timely, inclusive, and scalable support for farmers and farmer collectives where it matters most.’ <https://digitalgreentrust.org/>, accessed 3 June 2026.

⁷³ AgNext, founded in 2016, ‘is a fast-growing AgTech company that aims to solve quality and trust in food value chains by making them safer, transparent and fairer. With digitalization of food quality assessment as our core focus, we offer a uniquely integrated, AI-driven SaaS platform to agribusinesses for automated and instant food quality results. Incubated at IIT Kharagpur, AgNext got its first seed funding from a-IDEA National Agriculture Research in 2017. In the following years, funding was received from Omnivore and Kalaari venture funds as well. Recently, AgNext bagged the largest series A funding in AgTech space by AWI, Falcon Edge Capital. Total Funding: \$25 Mn+.’ <https://www.linkedin.com/company/agnextworld/?originalSubdomain=in>, accessed 26 May 2026.

KrishiTantra,⁷⁴ and Kalgudi.⁷⁵ The following digital technologies were deployed during its operationalisation:

- Digital Green developed a WhatsApp chatbot in partnership with open-source developer Glific. The chatbot, which converses in the Telugu language [the language spoken in Telangana], alerts a farmer throughout the day with suggestions depending on a crop's maturity. Farmers can also ask questions about their crops.
- Agritech startup KrishiTantra opened a chain of local soil testing centers. Farmers test soil samples using a machine-learning-powered device that analyzes acidity, nutrient levels, and other qualities. Where traditional soil testing might take several weeks to return results, KrishiTantra's system sends results and fertilizer recommendations to a farmer's mobile phone in less than an hour.
- AgNext provided a computer vision system that assesses the quality of individual chilis in the field. The system detects surface defects and estimates properties such as color, shape, and size, all of which can help reduce crop waste and increase sale prices. (The Batch, 2024: n.p.)⁷⁶

In addition, 'Digital Green with support from the Telangana government [had] also created a cadre of community resource persons who [were] trained to onboard farmers and ensure their engagement, for instance by disseminating videos' (World Economic Forum, 2023: 17).

⁷⁴ 'Krishitantra (M/s Klonec automation systems Pvt Ltd) is an Agri-tech startup specializing in soil technology, farm data acquisition, and related cloud services by building disruptive solutions for soil analysis using cutting-edge technologies.' <https://krishitantra.com/about>, accessed 26 May 2026.

⁷⁵ Kalgudi is an e-commerce platform and has 'enabled B2B (business to business) and B2C (business to consumers) sales of processed red chilli. Digital Green has listed 5,000 farmers with the Kalgudi market access platform in the chilli-producing districts of Telangana. Kalgudi also organized two buyer-seller meets in September 2022 and March 2023' (World Economic Forum, 2023: 15). 'We digitize collaboration – not just farms. Build networks, orchestrate workflows, and converge into a Network-of-Networks (NON).' <https://www.kalgudi.com/>, accessed 3 June 2026.

⁷⁶ 'Glific is a SaaS platform that enables NGOs to build and manage their own WhatsApp chatbot.... Facebook verification is an essential step in setting up your WhatsApp chatbot', <https://glific.github.io/docs/docs/>, (accessed 3 June 2026). Another document mentions that Digital Green had 'developed an AI-based WhatsApp chatbot in collaboration with web development and mobile app company ColouredCow to ensure the easy sharing of customized advisories with farmers, especially women and low-literacy individuals, on a real-time basis' (World Economic Forum, 2023:14).

The fieldwork in Khammam⁷⁷ opened with mixed awareness of Saagu Baagu and a gradual reconstruction of what the programme did in the project villages. It was surprising that a respondent (09R01) who had previously owned a chilli nursery in one of the project villages had not heard about Saagu Baagu. During an informal conversation in a roadside tea shop in Khammam with local farmers, initially, there was no recognition when the project name was mentioned, but, as the conversation proceeded, and with some probing, a few details emerged.

B (09L01) who was present in the tea shop had been employed by DG as a community resource person (CRP) on a monthly salary of INR 6,000 (≈ \$63) for six months during the pilot phase.

He recalled that DG had given some machines for grading the quality of chilli, digital machines, and one machine for video – after a brief pause, he recollected it was a projector in which videos could be displayed about farming. He also mentioned they used to get automatic messages on WhatsApp every day about the weather, good practices related to chilli farming like when to use fertiliser, what fertilisers can be used etc., and farmers could also type in any query they had in the local language, and they will get an automated response answering the query. I asked for images of the machines and WhatsApp chat. He said that he had them in his old phone but it fell into a well and he lost all the data from it. On enquiring about the machines, he mentioned they were placed in a common place in a Mandal [sub-district office], and all the machines (soil testing, chilli moisture and quality testing machines) were taken away by the Saagu Baagu team once the project closed. (field notes PP, 21 Nov. 2025)

SV (09L02), a Mandal Level Entrepreneur (MLE) (who received a monthly salary of INR 10,000, ≈ \$104) from DG for a year of the pilot phase, corroborated this and said that there were ‘three types of machinery – moisture machine, a “tent sort of machine”, where it showed the good and not so good *mirchi* [chilli] which gave a report, a mixer which grinds the *mirchi*, and gives a report, which can be printed with a mobile and a Bluetooth device – the report consisting of the parameters such as color, moisture, chemical mixture.’

During implementation, farmers received daily messages through WhatsApp-based links and a chatbot-like system. According to the MLE, all farmers in the revenue division were grouped with a chatbot. The work of CRP was to make a group and the messages he received were to be

⁷⁷ Empirical data collected from the field by Pratheep Purushothaman. See chapter on methodology for details.

delivered to the group. The messages contained weather forecasts, fertiliser schedules, guidance on transplantation and replanting, specific instructions on chilli cultivation, selling of the yield and marketing. Video guidance was also provided for transplantation/replantation, and fertiliser usage. The MLE could not show the chats saved from the time of phase 1 because he was now using a different digital app. Respondent MVN (09R05) also could not provide these as he had lost his phone and was using a new one.

While WhatsApp was central to information dissemination, respondents' descriptions suggested that the so-called 'chatbot' functioned more as a one-way communication channel rather than a responsive or interactive system. The farmers did not receive tailored or real-time responses to individualised queries but received automated pre-recorded messages and information.

Regarding marketing, respondents agreed that market facilitation produced a temporary benefit in chilli prices. Respondent SV (09L02), a former MLE, elaborated on the direct buyer procurement model introduced by DG, through which farmers 'definitely got Rs 1,000–1,500 benefit per quintal because they [the buyers] came directly to the farm and picked up the yield by themselves'. This practice eliminated middlemen, transport charges, and *hamali* (labour) fees. However, he clarified that this system could not be sustained without DG acting as a guarantor: 'when DG is not there, we can't rely on the buyers directly ... DG was [the] guarantee for our payments'. Farmers, however, even then, continued to remain dependent on commission agents for credit – a perennial dependency that prevented them from adopting market-linked sales channels. He noted that even in regulated markets, middlemen are unavoidable, with 2% commission plus additional charges being mandatory. He emphasised that the market linkage functioned effectively only when mediated by DG. After the withdrawal of DG, as credit cycles reasserted themselves, farmers returned to commission agents: 'commission agent gives the principal amount ... [and] we are forced to sell the crops to the same middlemen'. The system enabling buyer–farmer interaction was not independently accessible or operable by farmers and farmers were unable to sustain these linkages once the project team withdrew.

5.2.3 Collapse of chilli farming and the retreat of Saagu Baagu

The respondents were not very clear as to why Saagu Baagu was discontinued. Since it coincided with the rise of pests and serious devastation of the chilli crop, they surmised that the project was stopped

because of it. According to the MLE ‘the main reason was they [DG] concentrated on only chilli farming and the yield of chilli reduced’.

Farmers underwent losses and the interest is gone. I am also a farmer and there is no guarantee that there is a fertiliser for *nalli* and the crop would recover. I also lost 5 to 6 lakhs Rupees [$\approx$ US \$5,230 to US \$6,275] in chilli farming alone. I had cultivated 3 acres and *nalli* did not get controlled by anything. It used to start from the flowering stage affecting the leaves.⁷⁸ (interview MLE, 09L02)

While the respondents noted that there was no infestation in their area during Saagu Baagu period, by the end of phase 1, the acreage under chilli began to reduce due to *nalli*, wilt, and Gemini virus⁷⁹ leading to the collapse of chilli cultivation. One respondent stated, ‘In *nalli*, the leaves of the crop completely crumbled, and the yield reduced to 10 quintals from 20’; also, the pests could be ‘neither controlled by DG methods nor from the fertiliser shop vendors.’ The rising pest burden and volatile prices made the farmers shift to maize and cotton because these crops had a clearer procurement pathway. Noting that ‘today there is only approximately 15 acres of chilli cultivation compared to those days where it was 150–200 acres in the given revenue area’, SV (09L02) dejectedly stated, ‘every year the farmer is facing losses ... I am not interested in farming anymore.’

Respondents described the current pest outbreak as not a routine risk but a severe shock that disrupted the entire cropping cycle. This event was perceived as beyond the scope of both traditional practices and project-based interventions. Importantly, farmers did not report any systematic attempt by DG to investigate or generate new knowledge in response to emerging pest crises. The absence of adaptive, science-based problem-solving mechanisms limited the effectiveness of the intervention in dynamic field conditions. A critical limitation observed was that digital advisory systems did not play a significant role during this period of crisis. When faced with severe pest outbreaks, farmers did not find technology-enabled

⁷⁸ *Nalli* is the local term used in Telugu and Kannada for mites (specifically, the broad mite, *Polyphagotarsonemus latus*), while *Chilli Thrips* (*Scirtothrips dorsalis*) are often associated with them. These sap-sucking pests cause ‘Murda’ disease (leaf curl) (Vikaspedia). Crop rotation is one of the suggestions for controlling these pests. See <https://www.bighaat.com/kisan-vedika/blogs/management-of-thrips-and-mites-in-chilli-crop>, accessed 5 June 2026.

⁷⁹ ‘Curling of the leaf margins towards the midrib is the most distinctive symptom.... Since this is a viral disease there are not many effective preventive measures’, <https://www.bighaat.com/kisan-vedika/blogs/management-of-leaf-curl-virus-in-chilli>, accessed 10 June 2026.

advisories actionable or sufficient, highlighting the limits of such systems under high-uncertainty conditions.

One respondent summarised the role of DG thus: ‘they came, did some work, and left’, describing a sense of abandonment after high-visibility demonstrations.

It is unlikely that DG was unaware of the emergence of pests in chilli crops as it was reported in the national dailies as early as December 2021.

A new species of insect is damaging the chilli crop in several states in south India. Thrips Parvispinous, an invasive insect from Indonesia first seen in 2015, has spread rapidly, affecting chilli crop in nearly 9 lakh [900,000] acres in Telangana and Andhra Pradesh. ‘All the places where chilli is grown is infested by this species.... The infestation is so severe that we found 20–25 insects on each bud or flower,’ said Dr R Jagadeeshwar, Director of Research, at the [Telangana State Agricultural] university. (Janyala, 2021: n.p)

A study conducted between 2022 and 2024 in Telangana concluded that the rise in pests was paradoxically linked to increase in pesticide use and that ‘[a]mong the districts, Khammam stood first in terms of incidence of the pest, and usage more no. of insecticides with more frequency’ (Srinivasnaik et al., 2024). It is still not clear if, in addition to the indiscriminate use of pesticides, climate change and the lack of competition from other pests were additional factors in the devastating infestation (CABI BioProtection Portal, 2025). Field observations and anecdotal reports suggest that several chemical pesticides are ineffective in managing the CBT (Chilli Black Thrips) populations (CABI BioProtection Portal, 2025).

There have been suicides among farmers due to losses in chilli crop cultivation. Between January 2022 and March 2022, twenty farmers were reported to have died by suicide in Mahabubad district, and five in Khammam district after pests destroyed their chilli crop (Shagun, 2022). Most of these were tenant farmers who had incurred debts ranging from INR 6–12 lakhs ($\approx$ US\$800 to US\$13,700) and had taken 2–6 acres of land on lease (Shagun, 2022). The question is, was DG aware of this situation when they initiated Saagu Baagu? Unfortunately, the functionary from DG who was involved in Saagu Baagu did not agree to be interviewed when contacted. Recently China was reported to be rejecting chilli from India because of high pesticide residue content (Rao, 2026).

5.2.4 Digital practices that survived the pilot

The pilot catalysed habits that partly persisted even after the project: ‘Before [the project] farmers never used to look into the videos on YouTube ... but now the digital awareness has come,’ said one interviewee. Another observed continuity in advisory-seeking behaviour: ‘we have a farmer chat app today also ... then we used to get a link on WhatsApp and now it is an app directly.’ Agronomic practices like nursery-raised seedlings and raised beds were retained by some: ‘now we ... give it for nursery ... though it is a bit expensive, it is risk-free and the plantation is effective’. The continued use of mobile advisories by farmers is not surprising given that Telangana has a ‘tele-density’ of 109.27% and internet tele-density of 94.92% – both higher than the national average.⁸⁰ Of the 10,203 census villages in the state, 9,957 have mobile coverage’ (DC Correspondent, 2025). It was also interesting to note that in the small sample of six farmers in this study, one had lost his smartphone, and another’s had become dysfunctional because it had fallen into a well, indicating that possessing a mobile phone could not relied on for continuous identity.

5.3 Learnings from Saagu Baagu

While field-level interaction in the period following phase 1 of Saagu Baagu did confirm that there was an increase in income from chilli farming, it was short lived, particularly due to the emergence of several types of pests which caused huge devastation. Farmers incurred heavy losses and shifted to growing cotton or maize, with some reported suicides particularly among tenant farmers. Although, according to the respondents, DG was approached for advice, they were not able to provide any substantial help, material or otherwise, to deal with the agro-ecological crisis.

In Khammam, the preconditions highlighted in policy playbooks – sustained devices and diagnostics, continuing human facilitation, responsive advisory systems, and stable market intermediation – were not in place once the pilot ended. Machine-learning-enabled devices were withdrawn, advisory systems discontinued, and market linkages collapsed when institutional facilitation ended, creating a stark disconnect between AI policy frameworks and on-ground capacity. Farmers had adopted tools and practices during the pilot, but absorption failed when staff and devices were

⁸⁰ Tele-density is the number of active telephone connections (mobile and landline) for every 100 people in a specific area. Internet tele-density measures the number of active internet subscribers per 100 people in a specific area.

removed and administrative support thinned. Even so, video-based extension and advisories linked to weather retained value, hinting at a hybrid human–digital pathway that could have been strengthened with continuity and integration.

The findings suggest that digital agriculture interventions cannot remain confined to short-term pilot formats. A one-year or limited-duration engagement is insufficient to establish durable systems, particularly in contexts where agricultural risks unfold over multiple seasons. Moreover, for smallholders, institutional support is critical for online trading, which appeared to be a major reason for the increase in incomes. The findings reinforce a broader concern that pilot projects tend to be demonstrative in nature, producing visible short-term successes under controlled conditions, but face significant challenges when transitioning to scale. It also raises issues of accountability and ethics on the part of the various organisations involved (WEF, DG, Gates Foundation) who abandoned the farmers when they were in a critical need for ‘advisories’.

6. The Jan Dhan Yojana: The JAM trinity

The Pradhan Mantri Jan Dhan Yojana (Prime Minister's Scheme for People's Wealth) was launched on 8 August 2014. A scheme for financial inclusion, it is lauded, both nationally and internationally, for reaching out to the poor and marginalised (CGAP, 2017; Women's World Banking, n.d.).

India's financial inclusion journey is about more than numbers. It is about people gaining the tools to shape their own futures. From direct transfers to low-cost investments, every step is bringing banking, credit, and savings closer to every citizen. These changes are helping millions take control of their finances and build a secure tomorrow. (Government of India, 2025a: n.p.)

According to the Indian government website, so far, there are '58.57 crore beneficiaries banked ... ₹ [INR] 305,990.50 Crore Balance in beneficiary accounts [and] 13.55 lakh Bank Mitras delivering branchless banking services in the Country'.⁸¹

Box 6.1 gives a summary of the Mantri Jan Dhan Yojana.

The 'financial inclusion journey' is said to rest on three pillars, of what is popularly known as the JAM trinity: Jan Dhan (opening of bank accounts with zero balance), Aadhaar number, and mobile number. Currently there are 320 welfare schemes, involving 56 ministries, accessible only through the DBT, which is enabled through the JAM trinity.

The following section looks at each of these aspects specifically from our study respondents' point of view.

⁸¹ <https://pmjdy.gov.in/>, accessed 8 July 2026. 1 crore = 10,000,000 and 1 lakh = 100,000.

Box 6.1**Pradhan Mantri Jan Dhan Yojana (PMJDY)***Scheme details*

Pradhan Mantri Jan Dhan Yojana (PMJDY) is the National Mission for Financial Inclusion, which aims to ensure access to financial services, namely, basic savings and deposit accounts, remittance, credit, insurance, and pensions in an affordable manner. Under the scheme, a basic savings bank deposit (BSBD) account can be opened in any bank branch or Business Correspondent (Bank Mitra) outlet, by persons not having any other account.

Benefits under PMJDY

One basic savings bank account is opened for each unbanked person.

There is no requirement to maintain any minimum balance in PMJDY accounts.

Interest is earned on the deposit in PMJDY accounts.

A RuPay debit card is provided to the PMJDY account holder.

Accident insurance cover of INR 1 lakh (enhanced to INR 2 lakh to new PMJDY accounts opened after 28 August 2018) is available with the RuPay card issued to PMJDY account holders.

An overdraft (OD) facility up to INR 10,000 is available to eligible account holders.

PMJDY accounts are eligible for Direct Benefit Transfer (DBT), Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), Pradhan Mantri Suraksha Bima Yojana (PMSBY), Atal Pension Yojana (APY), Micro Units Development & Refinance Agency Bank (MUDRA) scheme.

Source: <https://pmjdy.gov.in/scheme>, accessed 8 July 2026.

6.1 Aadhaar

In the household survey, in the two field sites in Delhi all household members except for two babies (in the urban centre) had an Aadhaar number. In the Chhattisgarh field sites, 10% (25 members out of the total 247) of total members did not have an Aadhaar number; of the 25 without Aadhaar, only 3 were adults.

In all the field sites in both Delhi and Chhattisgarh, the initial recruitment for Aadhaar was through camps held in the vicinity of people's residences, mostly in schools, village panchayat buildings, etc.

There was a rumour in the village that that this is the only document that will verify your citizenship. Only document that will be valid in all government schemes to get benefits. (AK, 06R04)

There was a rumour among the village people that bank accounts will be closed and that we will no longer receive rations. (AS, 06R05)

There was a rumour in the village that if you go outside UP [Uttar Pradesh] as a migrant, and if you don't have an Aadhaar card, the police can inquire further, and no one will give you a room on rent. (HR, 06R06)

Village people often discussed how Aadhaar would be a special identification number issued by the government for every Indian citizen. Without it, one would not be able to access rations, pension, or even book a train ticket. Some even believed that in certain states, one couldn't stay in a hotel or dharmshala [cheap shelters for travellers] without Aadhaar. These discussions created a sense of fear that if I did not get Aadhaar made, I might face difficulties in the future, especially regarding access to government subsidies.⁸² (J, 06R07)

Hence, the initial drive in the early 2010s was not to access any specific benefits, rather, a fear was instilled in people's minds that they will not be able to survive without Aadhaar, particularly as it pertained to the question of accessing rations. It is interesting to note that the word 'rumour' was repeatedly used to describe the way information spread. Many agreed to get the card made because it was initially free, the process was simple and close to home. 'The operator took the finger "marks" and told us to "see" in a machine, then gave a receipt and told us not to change our mobile because a message will come in it' (AK, 06R04).

In the first drive for recruitment, it was mostly adults who got their Aadhaar cards made. However, they soon realised that Aadhaar was needed for children too, during school enrolment, for accessing scholarships and for Anganwadi registration.⁸³ It was then several problems began to crop up. One was the cost, as it was not necessarily free. During the in-depth interviews it could be seen that some families incurred heavy costs in terms of time and money for enrolling new members (children, including new births or those who had been left out by mistake), correcting errors in name,

⁸² 'Gaon wale hamesha iske bare me charcha karte rahte the ki ye sarkar dwara har bhartiya nagrik ko diya jane wala ek khas number hoga jiske bina nahin to ration milega na to pension milegi train ticket me bhi ye anivarya hoga. Yahan tak ki wahar rajya me iske bina koi hotel ya dharmashala bhi nahin milega.'

⁸³ The Anganwadi system provides supplementary nutrition for pregnant and lactating mothers, and children under five years of age.

age, address, updating mobile number, etc. More often than not, several errors in terms of mismatched name, age and address were clerical mistakes, but since such errors made the card invalid, the person needed to get it corrected using his or her own resources. The onus is on the concerned person and not on the UIDAI (Unique Identification Authority of India) responsible for registering Aadhaar. (See Box 6.2 for problems regarding names in regional languages in India.)

Box 6.2

Problems with names in regional languages

The Indian constitution recognizes 22 regional languages. Aadhaar enrolment can be done in 16 languages.

The UIDAI website states: ‘in case an applicant request [sic] for update of regional language in his Aadhaar ... If [the] operator is not well versed with the desired regional language, he/she shall intimate the same to the applicant and inform him that applicant shall be responsible for transliteration errors.’

One Reddit user queried: ‘I want to know if there will be any legal issues if purchasing land or other insurance related issues if my aadhar [sic] has a typo in hindi [sic]. So basically, my **name is correct in English**. But in Hindi there is a mistake of matra. Instead of using ि the guy who entered used ी. I have had no issues so far. I even got a passport issued as well. But I was wondering should I go through the hassle of correcting it or not?’ (bold in original). (In English, a Hindi *matra* (मत्रा) is most commonly called a *vowel sign* or a *vowel diacritic*. <https://www.quora.com/What-do-we-call-matra-Hindi-wali-aa-e-ae-etc-in-English>, accessed 17 August 2026).

Errors occurred even with English-language requests. For instance, the author’s name can be spelt either Sathya, Satya, or Sathiya because it is phonetically similar.

Source:

<https://uidai.gov.in/en/contact-support/have-any-question/301-english-uk/faqs/enrolment-update/language-transliteration.html>, accessed 4 August 2026.

<https://uidai.gov.in/en/298-english-uk/faqs/enrolment-update/enrolment-partners-ecosystem-partners/16504-is-there-any-provision-available-to-update-my-regional-language-in-aadhaar-to-display-all-fields-in-same-regional-language.html>, accessed 9 July 2026.

https://www.reddit.com/r/LegalAdviceIndia/comments/1k5qgmc/aadhaar_name_typo_in_regional_language/, accessed 9 July 2026.

As can be seen from the narrative of AS (06R05), a resident of the rural field site in Delhi, a single household can have multiple problems linked to Aadhaar enrolment. In the respondent's case, it was clerical error (wrong entry of age, incomplete entry), digital update not operationalised, inability to produce documents (birth certificate). Although he ended up spending a considerable amount of money and time, everything could not be rectified. His wife could not avail of pension because of one such error. (See Box 6.3.)

Box 6.3**Story of AS (06R05), a resident of the rural field site in Delhi on his trials with Aadhaar enrolment**

One month after registration, the family members' Aadhaar cards were delivered by post. However, an error had occurred in which the wife's age was recorded as being younger than her actual age, as recorded in the voter ID card, which caused the same incorrect age to appear on the Aadhaar card.

When he applied for pension, he was asked to update the Aadhaar card at the bank. At that time, a private vendor had been authorised to create and update Aadhaar cards in the village State Bank of India (SBI) branch. The update cost was INR 200 per person. He updated the Aadhaar details for himself, his wife, and his daughter, paying INR 600 in total. However, when the updated documents were issued, no changes had actually been made. Nevertheless, he submitted the Aadhaar copies to the bank, and the pension was disbursed for two months.

Later, when he visited the Aadhaar centre at — office to correct his wife's age, he was asked to provide additional documents verifying her actual date of birth, such as a birth certificate or educational certificates. Since he did not possess any such documents, the correction could not be made. As a result, she is now ineligible for old age pension.

The card holder's son and his wife enrolled for an Aadhaar number in 2014, when they were forced to provide their Aadhaar number in banks, schools and other government services where it had been made mandatory. They paid INR 600 (INR 300 each) to a private Common Service Centre (CSC) operator for their Aadhaar enrolment.

Later in 2018 and 2019, he enrolled his children for Aadhaar when the school administration asked him to deposit his Aadhaar number as per government guidelines. He booked an appointment slot for enrolment at — Aadhaar Enrolment Centre for their children where it was issued free of cost. However, he had to pay INR 800 as auto fare (transport). When the Aadhaar number of his son was issued, the date of birth was not complete, only the year was given, so he had to correct this by booking another appointment, for which he had to pay a fee of INR 50, and the auto and bus fare of INR 500.

It appears that the drive to get the poor and marginalised to register for Aadhaar, which was initiated in the early 2010s, was successful only because a fear was created among them that they would otherwise lose out on welfare benefits, particularly rations. Though initially free, all later registration led to both monetary and opportunity costs, often amounting to the loss of a minimum of 2 to 4 days' wages, which, for a precarious household, is a considerable cost. Correcting wrong entries because of clerical errors took an enormous amount of time, persistence and some costs, and in several situations these were never rectified. However, over a period of time people began to adopt the practice and 'voluntarily' registered the unregistered members of their family, particularly children and new births, as a form of governmentality. The government UIDAI website gives the following information on what they consider are myths:⁸⁴

Aadhaar Myth Busters

Is Aadhaar mandatory for getting mobile SIM?

NO. As per the amendments of the Telegraph Act, 1885, telecom users can use their Aadhaar number as a KYC documents along with authentication on voluntary basis to obtain a new mobile connection.

Is Aadhaar mandatory for school admissions?

Aadhaar is not mandatory for school admissions or for the examinations conducted by the Central Board of Secondary Examination, National Eligibility cum Entrance Test for medical entrance or the University Grants Commission.

However, data from our study shows that these are not 'myths' but the reality faced by our respondents from all the field sites in both Delhi and Chhattisgarh. Although UIDAI still continues to state on its website that Aadhaar is not mandatory for certain services, the practice on the ground contradicts this.

⁸⁴ <https://uidai.gov.in/en/my-aadhaar/about-your-aadhaar/aadhaar-myth-busters.html>, accessed 9 July 2026.

6.2 Jan Dhan: Banking the unbanked and the ‘underbanked’

In 2006, the Reserve Bank of India (RBI) introduced ‘a regulation allowing banks to provide service at people’s doorstep through the use of third party services. This model is referred to as Business Correspondent/Banking Correspondent’ (Chatterjee and Singh, 2019). These Customer Service Points (CSPs), also known as Bank Mitras (Friends of the Bank), are authorised, outsourced banking outlets that act as mini-branches for a specific bank, and which offer several banking facilities to customers such as account opening, cash deposits, withdrawals, and balance enquiries. Initially, only not-for-profit entities were allowed to operate as Banking Correspondents but later the private sector was let in (Chatterjee and Singh, 2019).

Common Services Centres (CSCs), on the other hand are private entities, set up by the Ministry of Electronics and Information and Technology under the Companies Act, 1956, and ‘are the access points for delivery of Government-to-Citizen (G2C) e-Services within the reach of the citizen, by creating the physical service delivery ICT infrastructure. It helps in making a transparent service delivery mechanism and reducing citizens’ effort in visiting government offices.’⁸⁵ CSCs have been set up in rural areas and urban slums to be ‘within the reach of the citizen ... making a transparent service delivery mechanism and reducing citizens’ effort in visiting government offices’.⁸⁶

However, unlike banks in India, both CSPs and CSCs charge their clients for every transaction they make, for depositing or withdrawing money. This is despite these organisations receiving a commission from the banks as well as for transactions with clients. Charges range from INR 10–20 per sum of INR 1,000 transacted. Unlike banks, they do not provide physical passbooks to their clients to check the entries in their accounts. Hence, for a population that is not literate in the general sense, their source of information on the status of their accounts is through these private channels. The banks also don’t need to check through biometrics as the client can sign or use a thumb impression to do bank transactions.

⁸⁵ <https://www.facebook.com/NeGDofficial/posts/common-services-centres-csc-are-the-access-points-for-delivery-of-government-to-/1444298061068913/>, accessed 16 August 2026.

⁸⁶ <https://csc.gov.in/>, accessed 9 July 2026.

All the respondent households in the household survey in Delhi, in both field sites, possessed at least one bank account. In the Chhattisgarh field sites, only four households (6%) reported not having a bank account. Of these, one said, ‘not interested’ and in three it was linked to Aadhaar (no Aadhaar, lost Aadhaar, or error in Aadhaar).

However, there was a clear divide in terms of where the bank account was opened between the Delhi and the Chhattisgarh sites (see Table 6.1).

Table 6.1

Facility where the bank account was opened household survey (in percentages)

Where account opened	Delhi urban (n = 39)	Delhi rural (n = 21)	Chhattisgarh rural (n = 59)
Bank branch	87.5	85.7	32.3
Customer Service Point (CSP)	2.5	14.3	4.6
Common Service Centre (CSC)	7.5	0	53.8
Online	2.5		
Combination of 1 and 3			7.7
Others			1.5

While the rural and urban field sites in Delhi were more or less at parity, with more than 80% of respondent households opening their accounts in a proper bank, in terms of Chhattisgarh a little more than half the accounts were opened at CSCs, which for some unknown reason are also called ‘choice centres’ in Chhattisgarh. These ‘choice centres’ appeared to be ubiquitous in rural and semi-urban areas because they were multi-functional, providing banking facilities as well as updating digital documents such as Aadhaar.

There was a disparity in terms of ease of accessing the bank accounts as well. While in the Delhi sites, banks and CSPs/CSCs were close to walking distances from where people lived, in the Chhattisgarh field sites the average distance from residences was 21 km for banks (local branches) and 7.5 km for CSPs/CSCs. Of a total of 68 respondent households, 21 (30%) reported a distance of more than 30 km to the nearest facility. For CSPs/CSCs, of the total 64 households that responded, only 16 (15%) reported a distance of 1–2 km and 16 (15%) reported a distance of 11–15 km, while the others fell in between. This being a hilly terrain, during

monsoons there was the additional problem of heavy flows in streams and rivers, making it difficult to cross.

Thus, to access CSPs/CSCs, most people had to spend considerable time and money travelling. Although, according to the government, these centres have been opened to facilitate ‘doorstep’ banking services with immediate access to benefits, the reality was far from this. In the past, DBT for old age, disability and widow pensions were delivered at the doorsteps of the recipients by the postal worker or panchayat functionaries who resided in the villages. While it was not unknown that these workers/functionaries took/demanded a small ‘commission’ from the beneficiary, the beneficiary preferred them because the cash was delivered to their door. Now, with the ‘banking’ system which was supposed to cut out these forms of corruption, the beneficiaries still ended up losing out on the full amount because they had to pay the CSPs/CSCs for their services as well as transport costs and, in addition, had to take time off from other tasks which added up to much more than what they would have paid as a ‘gift’ to the postman or village functionary.

To stop the ‘fraud’ by CSCs, one of the cooperative rural banks in Chhattisgarh had recently come up with a rule that only INR 1,000 would be disbursed at a time. According to KA (08M01), the manager of one such bank, this rule applied only to third parties (that is those linked to the CSCs and not directly to the bank). This is because they had received a lot of complaints that these centres were asking for large commissions from the customers if they withdrew a larger amount. According to her, the Kiosks and their extensions in the villages should be doing ‘*seva*’ (service) and not take too much money from customers. She was of the opinion that the amount of commission given by the banks should be sufficient to run the CSCs and other centres. The other banks (SBI, for instance) had not implemented this rule.

In some cases, the beneficiaries were not in a physical condition to travel because of their age, gender or disability, yet, despite that, they were forced to travel outside their villages to access benefits. This was particularly harrowing when they had to update their KYC in the banks because of deadline urgencies.

There were also reports of scams. Banking is said to protect savings by keeping clients’ money safe. However, some respondents who had some surplus wealth in the bank, often not amounting to more than INR 10,000, had lost it to scamsters who had siphoned it off digitally.

In Delhi, all the households in the in-depth survey had a minimum of one bank account, with 70% of households having more than one account. In Chhattisgarh, two households did not possess a bank account, both single-women households. In the rest of the households, 85% had more than one bank account. A major reason for opening bank accounts in all the field sites was to access social welfare benefits (DBTs), as this was the only route available to them to access it. Opening bank accounts was facilitated by the Jan Dhan account (popularly known as the ‘zero’ account or ‘*chota*’ – small account, where a passbook was not provided), which could be opened and maintained with zero balance. All these accounts were operated digitally through the CSCs or CSPs.

Gender disparity had reduced considerably, and women in 80% of the households in Delhi sites, and 96% of the households in Chhattisgarh field sites, had a bank account. In Chhattisgarh, one of the reasons for the high percentage of women account holders was a specific cash benefit scheme (unconditional) that the Chhattisgarh government had initiated in March 2024. In this scheme, known as Mahatari Vandan Yojana (Salutation to Mother Scheme), all married women from the age of 21 years are eligible to receive INR 1,000 per month which is paid directly into their bank accounts.⁸⁷ In Delhi state a similar programme for women was promised by all the political parties during the Assembly elections in 2025. However, after the elections, the promise was not kept by the party that won.

While the aim of banking the ‘unbanked’ or ‘underbanked’ population has been a success in terms of opening accounts, it has not led to asset building in terms of savings because the money from benefits is withdrawn as soon as possible and spent on household needs, specifically food. Moreover, it was also clear that although zero balance accounts were opened because of government’s initiative, a considerable proportion had become inactive and had to be closed by the banks after a while since there was no cash flow.

For instance, in July 2025, the Minister of State for Finance admitted in a written reply to a question in parliament that as many as 23% of these accounts were inoperative (Government of India, 2025c). Delhi and Chhattisgarh had 28.5% and 18.8% inoperative accounts respectively (Government of India, 2025c). According to a local bank manager (key informant KA, 08M01), for the banks, the zero account holders were more

⁸⁷ Only women belonging to families that pay income tax, or that have a person employed in the government, are excluded from this scheme.

<https://www.myscheme.gov.in/schemes/mvy>, accessed 10 July 2026.

trouble than benefit because of the amount of work involved without yielding any profit.

The Jan Dhan accounts do not really help the banks because people tend to withdraw money immediately, so money does not stay in the bank. For instance, during Corona time people would withdraw the INR 500 the moment it was deposited because they were scared that Modiji would take it back! Long queues would form outside the bank even during lockdown to do entry in passbook. (Local bank manager, key informant KA, 08M01)

6.3 Mobile

In India, the current cost of the cheapest basic mobile phone is around INR 500 to 1,000 (US \$5 to \$10) and the cheapest Android phone costs INR 4,500 (US \$45).⁸⁸ The pricing alone could determine who will be able to buy mobiles and which type.

In the Delhi household survey, all the households had at least one mobile phone; 36% had two phones; 21% three phones; and 11% four or more phones. There was an urban–rural disparity, with higher proportion in the urban site having two or more mobiles (83% as against 43%). Two events, demonetisation and the Covid lockdown spurred the purchase of smart phones in this area, particularly in the urban site. During demonetisation, mobile phones became necessary for businesses and payment. During the Covid lockdown they were needed to enable children to attend online classes, which continued even after the lockdown was lifted. They were also useful for entertainment. Hence, the number of phones a household had depended upon the number of adults as well as the number of older school children. In approximately half the households, a mobile phone was used for digital payment and online banking, and there was a marginal difference between the urban and rural field sites.

In contrast to this, in the Chhattisgarh field sites, 33 out of 69 (48%) households did not have any mobile phones. Among the households that owned a mobile phone, in three quarters of them, they were generally used for calling and entertainment. Only four households used them for digital money transactions.

Having a smartphone was linked to economic status, gender, age, and having children going to school. Some of the issues identified were that digital literacy was linked to formal literacy and the younger generation

⁸⁸ <https://dir.indiamart.com/impcat/keypad-mobiles.html>, accessed 11 July 2026.

were more adept at using the smart features, including digital money transactions. In a household with two or more mobiles, there was often a gender disparity, with the women possessing a basic phone whereas the men had a smartphone.

It appears that, although there has been a ‘penetration’ of mobile phones into the population from the lower economic strata, they are not serving the purposes envisaged by JAM.

6.3.1 Mobile connectivity

In addition to this, there was the issue of mobile connectivity in terms of both internet and electricity availability. The data from recurrent, seasonal surveys on the everyday experience of electricity supply and internet connectivity in Delhi and Chhattisgarh field sites showed very clear disparities across the sites.

Table 6.2 summarises the indicators across all three rounds of observations combined, by site (urban and rural) in the Delhi field sites.

Table 6.2

Cross-site comparison of connectivity in the Delhi field sites

Indicator (share of recall days)	Urban site	Rural site
Electricity available throughout the day	19/21 (90.5%)	14/21 (66.7%)
At least one power cut reported	2/21 (9.5%)	7/21 (33.3%)
Internet shutdown experienced	0/21 (0%)	2/21 (9.5%)
Used non-cash / digital means of payment	20/21 (95.2%)	16/21 (76.2%)
Digital transactions rated ‘very reliable’	14/21 (66.7%)	15/21 (71.4%)

The following are some of the findings in the Delhi field sites:

- The urban site had markedly more reliable electricity supply than the rural site across all seasons, and this stability did not vary much by season, whereas the rural site’s power cuts persist into and, according to this data, intensify during the winter round of research.

- Internet connection quality in the rural site improved sharply after the March round, while the urban site's connection quality was consistently rated as adequate-but-slow throughout the year with almost no variation.
- Digital payment reliability dipped in different seasons at each site, July for urban site, and March for the rural site, indicating that whatever was driving perceived unreliability is round-specific rather than a stable site characteristic.
- Internet use was skewed toward personal/consumption purposes (entertainment, digital payments) in the urban site, and toward livelihood-linked and citizen-service purposes (work, banking, welfare-scheme access) in the rural site, plausibly reflecting the rural respondent's role as a CSC operator.
- Neither site reported internet use for welfare-scheme access in more than a fifth of recall days, and the urban site reported none at all, suggesting that even where connectivity is stable, welfare-scheme access via the internet remains an infrequent activity relative to entertainment and payments.

In the Chhattisgarh field sites, there were problems in collecting data through the three seasons. Respondents in study site 3 (rural forest fringe) and 7 (urban) reported having a metered connection, and study site 1 (deep inside the forest) and 2 (inside the forest) reported solar as the main source of electricity. Solar electricity was usually available only for 2–3 hours in a day, between 6:30 p.m. and 9:30 p.m. in all the villages which come under study site 1 and 2. In the other sites, the key informants reported frequent cuts in electricity, sometimes through the entire day and there did not appear to be any particular seasonal variation. In all four seasons, more than 80% of key informants reported having used their mobile data to access the internet. Two respondents in the month of 25 April and one respondent in the month of 25 July used a dongle to access the internet. One respondent each in the months of 25 April, 25 July and 26 February used a public access point to connect to the internet. That uniform data could not be collected for all the sites for reasons such as mobile phones running out of battery charge, or because no electricity was available, or sometimes no mobile data was available, indicated that, even with the best possible intentions, connectivity posed a major obstacle for engaging in digital work.⁸⁹

The connectivity issue is pertinent for all services and activities that require digital access. However, at the population level the continuous need for

⁸⁹ These field-based research assistants were paid an honorarium for their work.

access to digital services is for access to welfare programmes which operate through DBT.

6.4 Concluding remarks

The Jan Dhan Yojana that rests on the JAM trinity for financial inclusion was launched to ensure access to financial services, namely, basic savings and deposit accounts, remittance, credit, insurance, pensions in an affordable manner. However, as can be seen, while Aadhaar enrolment has been a ‘success’, and also the opening of bank accounts and the penetration of mobile telephones into remote rural areas, this has not led to much change in people’s lives. The bank accounts act as mere conduits for transfer of money from the government for its various DBT schemes to the beneficiaries. With precarious households always running on a deficit budget, transfers are immediately withdrawn and spent on household needs, mostly food.

Among the three arms of the JAM trinity, the role of the mobile phone appears most questionable. Apart from being used for OTPs, it was used very little by our study respondents for other digital transactions, yet they had been forced to buy one at some point or the other for digital negotiations. Moreover, with unstable connectivity, both in terms of electricity and the internet, the rural–urban and regional divide was quite stark.

7. Key findings and conclusions

In this working paper based on Phase II of the research on the digitalisation of food assistance in India, we have focused on three main areas: the digitalisation of the PDS from ‘farm to stomach’; smart and precision agriculture; and the JAM trinity, which is the scaffolding said to hold up digital India.

Contrary to what the government has averred – that digitalisation is a success story in every way – the evidence gathered in this study points to a different narrative when viewed from the perspective of the poor and the marginalised. What comes out clearly is that they have been forcibly co-opted into a system which is of little benefit to them.

To begin with, recruitment for Aadhaar would not have been the success that the government boasts of had it not been linked to the oldest of the welfare programmes, the PDS. Prior to the Aadhaar, the ration card functioned not only as a means for accessing state-subsidised foodstuffs, but also as a proof of identity. Today there is an ever-present fear that, were they to default in accessing rations for even as little as three months, they could well be categorised as ‘ghost card holders’ and deleted digitally. Moreover, PDS is a welfare provision that has a deep emotional meaning for the poor as it is the only overt sign that they too are worthy of care. These are the reasons why, despite its less than substantial contribution to the family’s food basket except for those of extremely low pecuniary status, accessing rations is a monthly ritual that is followed faithfully, with almost religious fervour. This is the case even when doing so means incurring expenditure in terms of time and transport costs as this study has shown. Therefore, when access to PDS became contingent upon having an Aadhaar and registration centres were opened close to people’s residences, with services initially unpriced, people ‘voluntarily’ came forward to register in the system, little knowing what was in store for them in future.

It is not incidental that respondents in our study used the word ‘rumour’ to describe how information spread and how it was the fear that they would lose out on their rations and other welfare benefits that made them queue to get an Aadhaar. And, although on paper getting an Aadhaar continued to be a voluntary act, it was a mere matter of time until it became essential in other situations, such as inclusion in the formal economy (banking), enrolment in schools, in anganwadis, and even for getting a mobile SIM. Today, while there is no overt pressure, people have been governmentalised

sufficiently to accept Aadhaar's presence in every aspect of their lives to the point that they now 'voluntarily' register their newborns. Thus, it is the cynical use of 'hunger' that enabled the widespread acceptance of Aadhaar for a range of purposes other than addressing poverty and food insecurity. As one of our male respondents (05R03) commented, 'It is a trap; you cannot hide anything as it is linked to everything.' However, while the citizen has become 'transparent' to the state, the obverse is not true. In fact, digitalisation has led to the reduction in the transparency of state action, making it opaque, illegible, and unintelligible. For instance, the ordinary citizen who is poor and lacks general literacy, let alone digital literacy, has little information on what happens to the data collected from them, how is it being used, where is it being stored, who it is being shared with, in short how is it being assetised.

Digitalisation has not eased life for the poor even in accessing the PDS. It often excludes the food-insecure through failure to authenticate, and other technology-related issues. With the freeze on new ration cards, it has exacerbated the exclusion of the most marginalised people. Moreover, it has not prevented elite capture. Most of all, digitalisation has added to marginalisation by penalising the poor further as, for instance, the onus for even correcting errors made by the administration rests on the poor themselves. While the NFSA converted a welfare programme into a legal entitlement, by making it targeted it has divided citizens into rights bearers and non-rights bearers. It is in this context that digitalisation becomes critical for identifying and provisioning a 'targeted' (selected) population that is narrower than the larger potentially eligible population. More importantly, it has been granted the power to determine who can 'exist', digitally speaking, and to 'ghost' all the others for as little as a spelling error in their names.

Digitalisation of agriculture is another area which, as this study has shown, is of little benefit to small and marginal farmers, who form the bulk of farming households (86% at all-India level). Under AgriStack, the most important activity has been to digitise land records and to create an Aadhaar-like unique identification for every land parcel in the country.⁹⁰ The farmer ID links the land ID to their personal Aadhaar ID and this is meant to give access to several welfare benefits directed at this community.

⁹⁰ The initiative is called the Unique Land Parcel Identification Number (ULPIN).

However, the term ‘farmer ID’ is a misnomer because, in reality, it is a ‘landholder ID’ as the ID is only for those in whose name land is registered. Thus, the benefits that come with registering the land do not necessarily reach the actual farmer who may be cultivating the land without a land title (as is the prevalent practice in tribal areas), or who is a tenant or a sharecropper. Moreover, as this study has shown, a farmer ID is of little benefit even to landholders if they are in the small and marginal categories because they are not in a position to interact with the market via online trading (see WP-1). As the Saagu Baagu case study shows, even a successful story of high output and high income via online trading is short lived if not supported.

The findings regarding Saagu Baagu suggest that to be deemed a success, digital agriculture interventions cannot remain confined to short-term pilot formats. A one-year or limited-duration engagement is insufficient to establish durable systems, particularly in contexts where agricultural risks unfold over multiple seasons. Moreover, for smallholders, institutional support is critical for online trading, which appeared to be a major reason for the increase in incomes. The findings reinforce a broader concern that pilot projects tend to be demonstrative in nature, producing visible short-term successes under controlled conditions, but face significant challenges when transitioning to being sustained over a longer period or at a larger scale. This also raises issues of accountability and ethics on the part of the various organisations involved (WEF, DG, the Gates Foundation), who abandoned the farmers when they were in a critical need of ‘advisories’, digital or otherwise.

In fact, the Saagu Baagu experience reinforces a broader finding of this study. Whether in the case of digital welfare systems, food distribution, banking services or digital agriculture, technology rarely functions independently. Its effectiveness depends on the availability of infrastructure, intermediary actors and long-term institutional support. Where these are absent or withdrawn, the benefits of digitalisation can become fragile, particularly for small and marginal farmers and other vulnerable populations

It is not that these limitations are unknown; the question is why there is an insistence on digitising land records in a campaign mode alleging that it would be of benefit to small and marginal landholders. Once again, it appears that while the state wants and needs transparency from its citizens, its own objectives remain shrouded in secrecy. In effect digitising land records appears to be an exercise in mapping land ownership across the

country to make it ‘legible’ to state and businesses. This surmise is not far-fetched because a concern that has been raised repeatedly regarding data protection has yet to be addressed. This is particularly worrying because MoUs have been signed with several businesses, both national and transnational, as part of public–private partnership. In the absence of a personal data protection law, the legality of allowing private entities to collect personal information, including financial information, is a matter of grave concern. It seems to be setting the stage for landgrabs, as has happened in other parts of the world. As one activist put it: ‘If big businesses need the land, they will create a situation that will make people sell land. Till now farmers did go into debt and had to sell land. But it was to the local money lender or landlords. But now, with this digital technology, it will be bought by “outsiders” (foreign businesses). It will be difficult to struggle against international capital.’⁹¹

The Jan Dhan Yojana that rests on the JAM trinity for financial inclusion was launched to ensure access to financial services, namely, basic savings and deposit accounts, remittance, credit, insurance, and pensions in an affordable manner. However, our study has shown that while Aadhaar enrolment has been a ‘success’ as also the opening of bank accounts, and the penetration of mobile telephones into remote rural areas, it has not led to much change in people’s lives. The bank accounts act as mere conduits for transfer of money from the government for its various DBT schemes to the beneficiaries. With precarious households always running on a deficit budget, transfers are immediately withdrawn and spent on household needs, mostly food.

Among the three arms of the JAM trinity, the role of mobile phone appears most questionable. Apart from its use for OTPs, it was minimally used for other digital transactions by our study respondents, yet they had been forced to buy it as some point or the other for digital negotiations. Moreover, with unstable connectivity, both in terms of electricity and internet, the rural–urban and regional divide was quite stark.

In this context, it seems difficult to believe the Government of India’s assertion (below) on financial inclusion of its citizens, most of whom are poor and continue to eke a living with less than minimum wage and a deficit budget:

⁹¹ Trusted stake holders’ meeting at Ekalavya, Bhopal, India, 27 Sept. 2024.

[i]n just a decade, India has revolutionized its citizens' relationship with money. Now financial access is not a privilege. The financial inclusion initiatives in the country resulted in providing the banking [sic] facilities in the narrow lanes of rural area too. Through visionary initiatives like Jan Dhan Yojana, UPI [Unified Payments Interface], and Aadhaar-enabled payments, the nation has unlocked doors to savings, credit, and insurance for every citizen and made them Atmanirbhar [self-reliant]. The financial inclusion [does] not just provide banking facilities, but also provide[s] empowerment and opportunity to everyone and it could be confirmed with the data released by RBI [Reserve Bank of India]. (Government of India, 2025a: n.p.)

It is not incidental that, apart from in the first instance, when registering for Aadhaar was 'free', every subsequent activity has cost the poor substantially in terms of money and time that they can ill afford. To sum up, digital India has resulted in further marginalising the poor. They have little to gain but much to lose in this misadventure, which is not of their making.

Annex 1: Map of India

Map of India locating the three field areas



Source: <https://www.mapsofindia.com>

Annex 2: PDS timeline

Origins during the Second World War rationing system under British colonial rule

1939–43: first introduced in Bombay and then extended to six other cities by 1946 ≈ and 771 cities/towns and some rural areas; primarily for soldiers and workers

1950: independent India rationing to stabilise prices and ensure access to urban population (workers)

1960s: Green Revolution (part of the PL 480 deal)

1965: Food Corporation of India and Agricultural Prices Commission set up; procurement rates for paddy and wheat established to build buffer stocks

1974: first post-war global food crisis

1976: National Informatics Centre set up

1982–92: Uruguay Round of the GATT (General Agreement on Tariffs and Trade) Dunkel Draft – agricultural subsidies reduced, stockpiling reduced, intellectual property rights introduced

1990s: debt crisis and liberalisation of economy; PDS revamped

1995: creation of the World Trade Organization (WTO): for the first time, agriculture becomes part of international trade negotiations.

1997: targeted PDS (TDPS) – move from universal provisioning to provisioning only for BPL households; critiqued for mistargeting, poor management and corruption

2001: *Peoples Union for Civil Liberties (PUCL) vs Union of India (UoI)* – public interest litigation on starvation deaths amidst plenty

2008: second global food crisis; India not affected because of stockpiling of grains; India bans exports of grains

2009: introduction of the biometric Aadhaar to signify residency not citizenship

2013: National Food Security Act (NFSA): from a welfare to a ‘rights’ approach; but the targeted approach is retained

2014: World Trade Organization’s Trade Facilitation Act – India opposes the rule against stockpiling of grains in Bali and refuses to sign the agreement because of NFSA

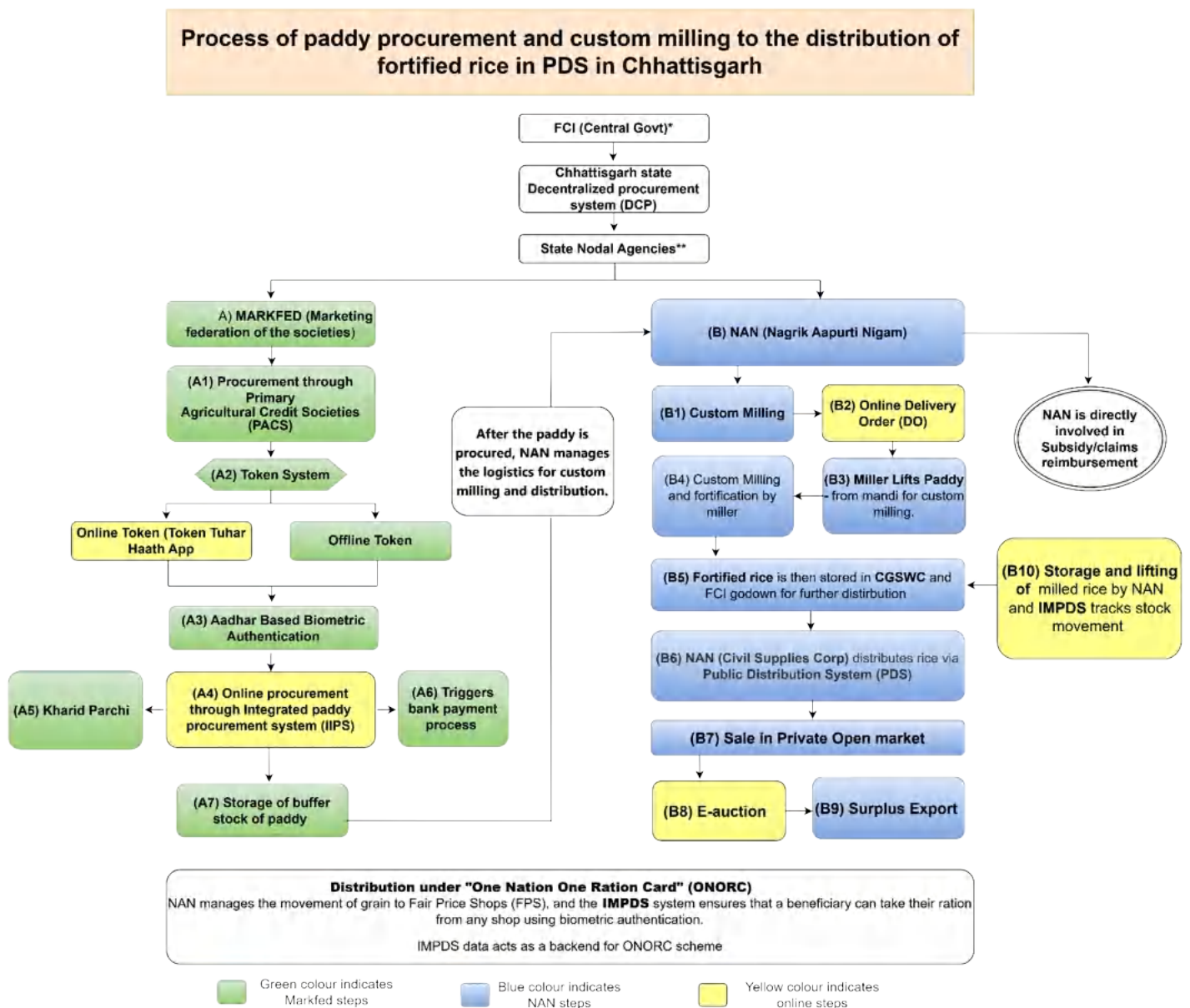
2010: digitalisation of PDS initiated

2015: linking of ration cards to the Unique Identification biometric Aadhaar number (AePDS); beneficiaries authenticated through ePOS (electronic point of sale)

2021: One Nation, One Ration Card (ONORC)

Annex 3: Flow chart – procurement to distribution in PDS

(Authors: Minal Madankar, Ravindra Kurbude and C. Sathyamala)



Notes:

* FCI (central government) – central government agency overseeing procurement.

** State Nodal Agencies – two agencies assisting in paddy procurement, custom milling, and distribution

(A) MARKFED – State nodal agency for paddy procurement, storage and fertiliser distribution. Primary entity that interacts with farmers, it operates in procurement centres (Samitis) where it buys paddy from farmers at the MSP.

(A1) Primary Agricultural Credit Societies (PACS) – these are village-level samitis (cooperative mandis). Physical work of weighing paddy, verifying farmer IDs, and uploading data to the portal is done by employees of these local societies.

(A2) Token System – farmers have a choice between using an online or offline token system.

(A3) ABBA – farmers will do Aadhaar-based biometric authentication at the mandi.

(A4) Online procurement happens through the Integrated Paddy Procurement System (IPPS). It does three instant checks: (1) land record validation, (2) token consumption, (3) Paddy weight integration.

(A5) Kharid Parchi – the system generates a computerised purchase receipt.

(A6) Triggers bank payment process – the mandi system sends a payment advice to cooperative bank triggering a payment process.

(A7) Storage of buffer stock of paddy – MARKFED manages paddy storage in mandis until it is lifted for CM.

(B) NAN (Nagrik Aapurti Nigam) - NAN is the distribution and milling coordination and state nodal agency for distribution and claim settlement.

(B2) Online DOs – millers receive online DOs for the specific amount of paddy they want to custom mill. This done through the IMPDS portal.

(B3) Miller lifts paddy – millers lift paddy from mandi for custom milling.

(B5) Storage of fortified rice – fortified rice is then stored in CGSWC and FCI godown for further distribution. CGSWC provides the space: it constructs and maintains scientific warehouses (godowns) used by NAN and the FCI to store milled rice.

(B6) NAN (Civil Supplies Corporation) distributes rice via the Public Distribution System (PDS) for local welfare schemes (NFSA) and the surplus is stored in FCI godowns.

(B7) Sale in the private open market – farmers sell their excess produce to private traders and millers at a lower price than the MSP.

(B8) E-auction – the FCI opens an e-auction process for private millers. The benchmark price for auction is less than the MSP

(B9) Surplus export – the paddy purchased by private millers through e-auction is then processed by millers to make high-quality rice and is then sold to international buyers/markets.

(B10) Storage and lifting – once the rice is milled, NAN ‘lifts’ it from millers. IMPDS tracks this stock as it moves into NAN's godowns.

Annex 4: Protest by PDS dealers

<http://www.aifpsdf.org/>

(Translated from Hindi by Ravindra Kurbude) Excerpts:

A meeting regarding issues of FPS (Fair Price Shop) dealers and decisions about their future was held on 28-03-2025 at the Muktheadhara Auditorium, New Delhi, from 11:00 AM to 3:00 PM ...

Representatives and leaders from 13 states – Assam, Bihar, Delhi, Jammu & Kashmir, Jharkhand, Kerala, Meghalaya, Odisha, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand, and West Bengal – attended the meeting. Many FPS dealers from various states also participated, and detailed discussions were held regarding the problems faced by FPS dealers.

‘We want justice for FPS dealers’ – this slogan was strongly raised in the meeting ...

While conducting the meeting, the National General Secretary spoke about how three planets (in Indian context) *Shani*, *Rahu* and *Ketu* have influenced our various businesses. A comment by hon’ble supreme court ‘Providing free ration to unemployed instead of employment’ is *Shani*. Linking bank accounts for DBT is *Rahu* and the assessment conducted by the Income Tax Department regarding the eligibility of beneficiaries receiving highly subsidised food grains is *Ketu*.

The National General Secretary requested that each district submit one real beneficiary ration card, Aadhaar card, and mobile number photocopy, and send them to the state leaders who will send these documents to the headquarters of this federation in Kolkata, so that if the government decides to implement DBT, they can file a Special Leave Petition.

The leaders who spoke were united and spoke with one voice regarding the following:

DBT – this must be stopped at all costs.

Covid – during the pandemic, FPS dealers risked their lives to serve beneficiaries and ensured no one died of hunger.

Margins – an increase in margins is essential, but first the PDS must be shielded from the government’s adverse scrutiny.

There must be a fixed remuneration system for FPS dealers or a guaranteed minimum monthly income of ₹50,000 per shop.

At the very outset, leaders from across the country were requested to discuss or speak on the issues facing their respective states, specifically focusing on two points: (1) DBT (Direct Benefit Transfer) and (2) the mode of agitation (*Andolan*). During the meeting, two booklets were distributed, titled: (1) ‘Conference of Food Secretaries: Public Distribution System (PDS, NFSA, BPL Divisions) – 28 February 2025’ and (2) ‘Proposed Amendments to the TPDS Control Order Regarding Various Issues’ (priced at ₹300). Also provided were copies of questions raised in the Lok Sabha by our Chief Advisor, Hon’ble Professor Saugat Roy, MP (Lok Sabha).

Annex 5: Namo Drone Didi

Interview: Drone Didi, Ramya Bai (name changed, 08L01) from Chhattisgarh

Date and time of interview: 19 August 2025, 9:40 a.m. to 10:30 a.m.

Place of interview: Drone Didi's home.

Interviewer: Minal Madankar and C. Sathyamala

Ramya Bai is a BSc graduate, married woman with three daughters. She credits her father, (and her living in an urban area while growing up), for getting her education: 'In my childhood, my father used to work in the milk dairy department, and he did not live here in the village. I did my studies in ——— city, as I used to live there. Had I lived here in the village, I would have been married at the age of 12.'

Ramya Bai is a member of a self-help group established under the National Rural Livelihood Mission (NRLM).⁹² The group was established in 2019, and she has been a member since then. She is the cluster coordinator of eight villages. The group runs a shop that sells fertilisers at a low-cost subsidised rate to its members. There is also a microfinance scheme for the members, which enables them to obtain loans from (public sector) banks.

Both because of her educational qualifications and leadership qualities, she was selected for the training programme on drone technology for agricultural spraying which was held in Gwalior.⁹³ Initially, she refused because she would have to be away from her family for 20 days, the duration of the training and travel to and from, but was finally persuaded to attend. There was a batch of ten women, all from rural areas. A rigorous training was given under an Army Colonel and, after they passed both written and practical exams, they were sent back with a certificate. They were trained in operating the drone, and on how to handle the different parts and assemble them, and how to operate (fly) the drone. A few months after the training, they received a drone from IFFCO (Indian Farmers Fertiliser Cooperative Limited). They were given another three days of training on the fields. She has been operating the drone since then, that is, since early 2024. The drone is used to spray liquid nano urea, nano DAP and pesticides.

'Initially, people had to be told. We took the drone to them and demonstrated its flying. We explained that for spraying minimal time would be required by a drone and that it would only work on leaves. We told them that they could operate it by standing on one side of the field and that they would not have to get into the field. We also told them that its impact would be greater than that of the sprayer. We flew the drone at many places in the adjoining areas to show them. Then all the farmers happily called us.'

'See, it takes them an hour to spray 1 acre through a sprayer. If one sprays through a drone, then it is done in 7 minutes. The big-scale farmers like it more. I went to those who had 20

⁹² For details on NRLM, see

<https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=155655&ModuleId=3®=48&lang=2>, accessed 6 June 2026

⁹³ Gwalior is approximately 1,150 km from her village; a train journey approximately 12–13 hours.

acres of land and also to those with 30–40 acres of land. There is an app on my mobile, through which I can keep track of the details of all the farmers I have visited.’

‘Now, it costs Rs. 300 ($\approx$ US\$3) for every acre. It would be somewhat the same expense [if a sprayer is used] but with our machine, much less time is needed. While our machine can complete the entire farm in 2 hours, if done normally, a lot of time will be taken. Even a small-scale farmer can also benefit from this, if he wants. But he thinks that since his farm is small, there is no point in calling drone didi and he can manage himself. And thereby he also does not have to pay anything.’

‘We are using nano in this.... The IFFCO people told us to take Rs. 200 from the farmers and that they would give us nano worth Rs. 100. Like we used to take Rs. 200 for 1 acre, in that nano worth Rs.100 was used. That money was sent to our bank account. Now, nobody is using nano. Everyone is using medicines [pesticides], for which Rs. 300 needs to be paid. And those who are using nano, they charge Rs. 200 ... [we] get around Rs.150.’ She also has to pay a driver when the drone has to be taken to distant farms.

‘The IFFCO people have made an insurance for 3–4 years. But they tell us that since they have given it to us, we should not misuse it. This is an order. A battery was also damaged over there.’

‘When we went for training, we were told that farmers used sprayers for sprinkling and completely bathed the plants. As a result, water went absolutely down. And, when we do it with drones, its effect is only till the top surface. As a result, the plant does not become sweet and there are less insects. By explaining this, we also spread awareness among farmers at many places.’

‘There are many farmers who do not trust us women. They tell us “We are into farming for so long. And now you are going to tell us about it”?’

‘My husband trusts me a lot. When I was leaving for my training, he told me not to go outside for so many days. Then our Sirs explained.... No one sends his wife outside with so many people in apprehension of what she would be doing, how she would be staying there. If husband’s support is not there, no one can progress.... Because of my husband’s support, I could achieve so much.’

To the question why women were taken for this training, Ramya Bai responded: ‘Modi ji thinks that perhaps women work better. I believe ever since we have completed our training and come back, men have been behaving differently – as if women would not be able to do it! When I go out to drive drone, it takes some time to set up the drone. Then the men keep saying that I do not know how to drive it. Had there been a man in my place, they would not have told like this.’

After the interview, she took out the drone from its place, assembled the parts and demonstrated it flying in her backyard. The drone was very heavy and needed three people to carry it.

The interviewers are grateful to Ramya Bai for the interview, as she made a special effort even though she was at home resting.

Interviews conducted in Phase II

From Delhi site

Key informants				
S.n.	Respondent	code	Date of interview	interviewer
1	PDS dealer Block 3	05L06	05.12.24	AD and CS
2	PDS dealer Block 4	05L07	18.11.24	AD and CS
3	PDS dealer Block 4	05L08	18.11.24	AD and CS
4	PDS dealer Block 4	05L09	05.12.24	AD and CS

In-depth interviews					
S.n.	Respondent residence	Reason for selection	Code	Date of interview	interviewer
1	Urban	AAV card holder	05R01	12.05.25	AD and CS
2	Urban	AAV card holder	05R02	15.05.25	AD and CS
3	Urban	Has 2 ration cards	05R03	19.05.25	AD and CS
4	Urban	Waste picker hh. Husband with disability pension	05R04	22.05.25	AD and CS
5	Urban	Exp.of ration fraud	05R05	04.06.25	AD and CS
6	Urban	No ration card although eligible	05R06	19.04.25	AD
7	Urban	Family in village ONOC	05R07	26.05.25	AD
8	Urban	Widow pensioner	05R08	20.09.25	AD
9	Urban	Sells rations, scammed	05R09	14.06.25	AD and CS
10	Urban	Widow pensioner no RC	05R10	19.10.25	AD
11	Urban	Problem with getting RC	05R11	15.05.25	SL
12	Urban	No ration card disability pension applied for	05R12	18.05.25	SL
13	Urban	No RC and lost Aadhaar card	05R13	20.05.25	SL
14	Rural	6 acres of land but has PHH card	06R01	10.02.25	SK
15	Rural	Migrant casual worker	06R02	10.02.25	SK
16	Rural	Migrant household	06R03	24.05.25	SK
17	Rural	Migrant no RC	06R04	11.05.25	SK
18	Rural	Old age pension problem adding names	06R05	17.05.25	SK
19	Rural	Contract farming	06R06	20.04.25	SK
20	Rural	Old age pension	06R07	22.05.25	SK

AD =Arjun Dubey; CS = Chaya Sharma; SL = Somjita Laha; SK = Subodh Kumar

From Chhattisgarh site

Key informants					
S.n.	Respondent	code	Date of interview	interviewer	
1	PDS dealer	03I01	2.10.24	MT	
2	PDS dealer	01L01		AB	
3	PDS dealer	07L01	18.02.26	MM and RK	
4	Drone didi	08L01	19.08.25	MM and SM	
5	Bank manager	08M01	20.08.25	SM and AB	
6	Food controller	08M02	18.02.26	MM and AK	
In-depth interviews					
S.n.	Respondent residence	Reason for selection	Code	Date of interview	interviewer
1	Rural	Had to buy new phone, BPL card holder	03R01	17.10.25	MT
2	Rural	Had to buy new phone, PHH/BPL	03R02	14.07.25	MT
3	Rural	PHH/BPL, no phone	03R03	18.08.25	MT
4	Rural	AAY card holder	03R04	23.07.25	MT
5	Rural	No Aadhaar card no ration card	03R05	20.08.25	MT
6	Rural	No phone, PHH/BPL card holder	03R06	14.07.25	MT
7	Rural	Finger/iris scan issue in pds shop, AAY card holder	03R07	20.08.25	MT
8	Rural	AAY, very poor household	03R08	20.08.25	MT
9	Rural	Had to buy new phone and SIM	03R09	20.08.25	MT
10	Rural	AAY card holder	03R10	23.07.25	MT
11	Rural	Had to buy new phone and SIM; suffered documents related issue	03R11	06.08.25	MT
12	Rural	No phone	01R01	18.08.25	PC
13	Rural	AAY, Aadhaar card was not updated	01R02	19.08.25	PC
14	Rural	APL card holder	01R03	18.08.25	PC
15	Rural	AAY, no phone	01R04	18.08.25	PC
16	Rural	No phone, AAY	01R05	11.08.25	PC
17	Rural	AAY, daily wage labourer	01R06	19.08.25	PC
18	Rural	No phone, finger scan issue	01R07	18.08.25	PC
19	Rural	APL card holder, repeated visits for finger scan	01R08	21.10.25	PC
20	Rural	AAY card holder	01R09	22.07.25	PC
21	Rural	Finger scan issue, repeated visits to make digital ration card	01R10	11.08.25	PC
22	Rural	AAY card holder	02R01	07.09.25	AB
23	Rural	AAY, No phone	02R02	18.08.25	PC
24	Rural	No phone	02R03	07.08.25	AB
25	Rural	AAY card holder	02R04	25.09.25	AB
26	Rural	AAY card holder	02R05	25.09.25	AB
27	Urban	Daily wage labourer, they are from new slum area	07R01	05.09.25	PC
28	Urban	Daily wage labourer, they are from new slum area	07R02	06.09.25	PC

AB = Anil Bame; MT = Manju Thakur; MM = Minal Madankar; PC = Prafull Chandel; RK = Ravindra Kurbude; SM = Sathyamala

Saagu Baagu case study

	Respondent	Code	Date of interview	Interviewer
1	Initial point of contact – he had a chilli nursery – but now has a seed and fertiliser shop	09R01	21.11.25	PP
2	Chilli farmer	09R02	21.11.25	PP
3	Chilli farmer	09R03	21.11.25	PP
4	Chilli farmer	09R04	21.11.25	PP
5	Chilli farmer	09R05	21.11.25	PP
6	Worked as Community Resource Person (CRP) in Saagu Baagu	09L01	21.11.25	PP
7	Mandal Level Entrepreneur (MLE) who worked in Saagu Baagu	09L02	21.11.25	PP
8	MLE who worked in Saagu Baagu	09L03	22.11.25	PP

PP = Pratheep Purushothaman.

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