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Digital food assistance in India

Towards a digital welfare state.

C. Sathyamala; IHD, New Delhi; ISS, The Hague

Somjita Laha; IHD, New Delhi

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Preface and acknowledgements

This working/discussion paper is part of an ESRC-funded study (Economic Social Research Council; UKRI 2023) on ‘*Digitalising Food Assistance*: Political economy, governance and food security effects across the global North–South divide’. India is one of the three case study countries, the others are Sudan and the UK. Susanne Jaspars is the Principal Investigator for the project at SOAS, with C. Sathyamala as Co-Principal Investigator based at the Institute for Human Development (IHD, New Delhi, India) and Tamer Abd Elkreem from the University of Khartoum as Co-Investigator. The Indian case study is led by C. Sathyamala with the support of Somjita Laha as senior researcher.

This paper is authored and edited primarily by C. Sathyamala with support from Somjita Laha, who took the lead in drafting the section on the Public Distribution System (PDS). In Delhi, empirical data for the study was collected by Subodh Kumar, Arjun Dubey (IHD, New Delhi) and Chhaya Sharma; in Chhattisgarh, Ravindra Hurbude, Minal Madankar, Prafull Chandel, Anil Bamne and Manju Thakur (JSS, Bilaspur) collected the data. The field team was also involved with the tabulation and preliminary analysis of the field data and in identification of relevant grey literature (in Hindi). Key informant interviews were conducted by C. Sathyamala and Somjita Laha.

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Cover photo credit: Ms. Minal Madankar

Invitation for feedback

This working paper presents work in progress and serves as a discussion paper. We are grateful for any feedback you may have. The authors look forward to comments, thoughts and suggestions to further the analysis presented in this paper, and on what we should be exploring in the next phase of our research.

Please provide comments by 31 June 2025 to: dfaproj@soas.ac.uk.

List of acronyms

AAY: Antyodaya Anna Yojana	MGNREGS: Mahatma Gandhi National Rural Employment Guarantee Scheme
AePDS: Aadhaar-enabled Public Distribution System	MNIC: Multipurpose National Identity Card
APL: above poverty line	MoU: Memorandum of Understanding
APMC: Agriculture Produce Marketing Committee	MSP: Minimum Support Price
BPL: below poverty line	NFSA: National Food Security Act
CCC: Chaos Computer Club	NIAI: National Identification Authority of India
DBT: Direct Benefit Transfer	NIC: National Informatics Centre
FCI: Food Corporation of India	ONORC: One nation One ration card
FPS: Fair Price Shop	PDS: Public Distribution System
GoM: Group of Ministers	PR: Priority households
ICMR: Indian Council for Medical Research	SKM: Samyukt Kisan Morcha
IMPDS: Integrated Management Public Distribution System	TPDS: Targeted Public Distribution Services
INR: Indian Rupee	UIDAI: Unique Identification Authority of India
KCC: Kisan Credit Card	
LPG: Liquid Petroleum Gas (cooking gas)	

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

Atal Pension Yojana: Contributory Pension Scheme
Kisan Credit Card: Farmer's Credit Card (for loans)
Pradhan Mantri Jan-Dhan Yojana: Prime Minister's Public Finance Scheme
Pradhan Mantri Jeevan Jyoti Bima Yojana: Prime Minister's Life Insurance Scheme
Pradhan Mantri Kisan Samman Yojana: Prime Minister's Farmer's Tribute Fund
Pradhan Mantri Kisan Maan Dhan Yojana: Prime Minister's Farmer's Contributory Pension Scheme
Pradhan Mantri Suraksha Bima Yojana: Prime Minister's Accident Insurance Scheme

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.

This working paper reports on phase I – the exploratory phase – of ESRC-funded research into the effects of digitalising food assistance in India. 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 the food security of both producers and consumers from marginal households.

The questions addressed in this research are: To what extent have food assistance and social welfare practices been digitalised, and why? What are the key organisations, authorities and businesses involved? The working paper presents a literature review, observations, and findings from 29 interviews from two field sites in Delhi state and three in Chhattisgarh state. It also includes insights from interviews with two Delhi state officials, a member of an NGO and three high-level key informants. Delhi state was chosen on the assumption that it would have the best infrastructure available, even for the marginalised sections of population, as it is the political and administrative power centre of the country. Chhattisgarh state, on the other hand, is classified as one of the least developed regions of the country and is one of the poorest states.

In this phase of the study, we have focused on three main areas: the biometric Aadhaar number, the PDS, and agriculture in chapters 4, 5 and 6 respectively. The Aadhaar number has become the lynchpin of digital India, playing a central role in e-governance and in accessing social welfare programmes, banking, and mobile services. The genealogy of Aadhaar shows that its success lay in coercion. Since it failed to attract registration as a voluntary scheme, it was made mandatory for accessing rations through the food security programme of PDS. Forced registration due to lack of choice in the context of hunger helped create a national database. This imposition was justified based on the proposition that it would make the welfare system more efficient by preventing fraud. Chapter 4 examines some of the troubling aspects of the Aadhaar scheme, particularly the role and involvement of transnational organisations that are linked to defence and

border security services in alien countries, as well as the problems of securing such sensitive data and loss of privacy.

Chapter 5 looks at the functioning of the PDS, the food assistance programme that is specifically designed to reduce food insecurity of those categorised as ‘below poverty line’ (BPL), which was fully digitalised by late 2016 on the justification that it would improve efficiency and reduce corruption. The literature review and observations from the two field sites in the state of Delhi demonstrate that different actors perceive the process and outcome of digitalisation in diverse ways, depending on their position in the PDS management chain. State officials and PDS dealers are largely found to favour the digitalised system, and it has also eased the ration distribution process for ration shop owners. However, the issues of leakage and corruption have not been addressed; rather, digitalisation has opened new avenues for malpractice even as some older practices also continue. However, as the field data is scant, the next phase will include a larger number of beneficiaries in both Delhi and Chhattisgarh state.

Chapter 6 of this working paper examines the potential implications of digitalisation of agriculture with particular reference to small and marginal farmers. It examines the government’s repeated assertion that digitalisation would lead to the betterment of marginal and small farmers in the country. This is based on the assumption that this category of farmers will be capable – with respect to the use of digital technology – of engaging with and participating in online trading in national and global markets. Data collected from field sites in Chhattisgarh shows that it may not be possible for marginal and small farmers to engage with online trading in any meaningful way. In this primarily rain-fed area, market interaction depends on the size of the farm. In marginal farmer households, the amount of produce (paddy) is so low that the bulk of it is kept for self-consumption as the ration they receive through PDS is not sufficient to meet the family’s needs. Thus far none of the respondents in the study had adopted any digital technologies linked with precision farming. In the next phase of research we plan to explore the digitalisation of land records under the project Agri Stack. In this region, where tribal communities have traditionally cultivated common land, documentation of ownership does not exist for many households and it remains to be seen how the process of digitalising land records would affect them.

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 food exporter, being the ninth largest exporter of agricultural products in the world (United Nations, n.d.). Yet the country has one of the highest rates of prevalence of undernutrition in the world. In 2018, 14.4% (out of the total population of 1.37 billion) was said to be undernourished, and, with a 22.2% share of the global undernourished in the country, India was assigned first place in the global ranking of undernutrition (Worldometer, n.d.). In 2023, as per the Global Hunger Index, out of 125 countries that were assessed, India ranked 111 with a score of 28.7, categorised as ‘serious’ level of hunger (Global Hunger Index, n.d.).

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. A digital welfare state is defined as one with ‘systems of social protection and assistance ... increasingly driven by digital data and technologies that are used to automate, predict, identify, surveil, detect, target and punish’ (UN Secretary-General, 2019: 4). Digitalisation is said to reduce corruption and increase the efficiency of government welfare programmes, improve access to government and banking services, reduce the urban–rural divide, boost economic growth and create employment opportunities.

On 1 January 2013, the Indian government launched the Direct Benefit Transfer (DBT) scheme. This was:

[w]ith the aim of reforming Government delivery system by re-engineering the existing process in welfare schemes for simpler and faster flow of information/funds and to ensure accurate targeting of the beneficiaries, de-duplication and reduction of fraud. (Direct Benefit Transfer, n.d.: n.p.)

The DBT was built on a digital platform linking bank accounts, unique identification numbers (Aadhaar numbers) and mobile phone numbers (Sharma and Nair, 2016). The direct electronic transfer of money was allegedly meant to reduce delays in payments, allow for more accurate targeting of beneficiaries and

² ‘Based on the values of the four indicators, a GHI score is calculated on a 100-point scale reflecting the severity of hunger, where 0 is the best possible score (no hunger) and 100 is the worst. Each country’s GHI score is classified by severity, from low to extremely alarming’ (Global Hunger Index, n.d.). A score of between 20 and 34.9 is considered ‘serious’. ‘The Global Hunger Index is a peer-reviewed annual report, jointly published by Concern Worldwide and Welthungerhilfe’ (Global Hunger Index, n.d.).

curb leakages (Ministry of Finance, n.d.). The scheme began with a subsidy to domestic LPG (Liquid Petroleum Gas) consumers that was only paid via DBT, and for subsidised grains in the Public Distribution System (PDS). Currently there are 320 welfare schemes accessible only through the DBT.³

On 28 August 2014, the Pradhan Mantri Jan Dhan Yojna⁴, a financial inclusion programme was launched. Popularly known as the JAM trinity, it rests on Jan Dhan (opening of bank a account), the Aadhaar number and the mobile number and is meant to facilitate the DBT schemes. 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.).

This rapid emergence of digital India in barely ten years has been lauded nationally and internationally (Alper et al., 2023; Invest India, 2024; Ministry of Electronics and IT, 2024). It is seen to be particularly significant given the fact that India falls under the category of ‘lower-middle-income’ country, as per the 2023 World Bank’s classification of economies by income levels (World Bank, n.d.).⁵

However, major shortcomings have been pointed out, chief among them being the slow development of the necessary infrastructure, lack of connectivity, low digital literacy, issues regarding cyber security, and data privacy. Questions have also been raised as to whether digitalisation of welfare schemes has in reality improved efficiency and reduced corruption. It is the intention of this research to understand if any dissonance could exist between the stated advantages and the potential risks of India’s welfare state transforming into a digital one; this would be with a specific focus on digitalisation of food assistance.

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

³ See: <https://dbtbharat.gov.in/central-scheme/list> (accessed 29 November 2024).

⁴ The Jan Dhan Yojna comprises ‘basic savings & deposit accounts, remittance, credit, insurance, pension ... 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 ... [these] accounts are eligible for DBT, Pradhan Mantri Jeevan Jyoti Bima Yojana (one-year renewable cover term life insurance scheme), Pradhan Mantri Suraksha Bima Yojana (one-year renewable personal accident insurance scheme), Atal Pension Yojana (contributory old age pension scheme), Micro Units Development & Refinance Agency Bank scheme (providing loans at low rates to micro-finance institutions and non-banking financial institutions).’ <https://pmjdy.gov.in/scheme> (accessed 30 November 2024).

⁵ Lower middle-income economies are those with a GNI per capita between \$1,146 and \$4,515 (World Bank, n.d.).

to ‘food aid’ (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 agriculture sector and its consequences for food security of both the producer and consumer from marginal households.

2. RESEARCH METHODS

2.1 Research questions, concepts and methodology

Overall, this study seeks to answer the following three research questions:

To what extent have food assistance and social welfare practices been digitalised, and why? What are the key organisations, authorities and businesses involved?

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?

What are the implications of digitalising food assistance for the food security of marginalised populations?

The 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. We identify the range of practices associated with digitalised food assistance, the underlying assumptions and ideology, 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 (Schaffer, 1984; Foucault, 2007). As such, we also look at it as a form of governance, and examine aspects of surveillance and ways in which assistance affects behaviour. This is combined with a political economy analysis of how aid can become part

of processes of maintaining power for some and creating vulnerability to food insecurity for others (see for example: Duffield, 1994; Keen, 1994; Mkandawire, 2005). Finally, in examining effects on structural causes of food insecurity, we examine social networks, labour relations, food subsidies, markets and land ownership (Pottier, 2016).

Given the exploratory nature of the research, the methods employed are qualitative, providing a means of examining lived experiences, interactions between digital practices and political and economic processes, and causal linkages with food security outcomes (Bryman, 2008). This exploratory phase included a literature review, semi-structured interviews, and observations. All interviews were carried out with an informed consent procedure based on the common protocol developed for the ‘Digitalising Food Assistance’ project. The combination of interviews and observations facilitated triangulation, enhancing the validity of the research findings by confirming, complementing, or challenging the insights gained from each method (Patton, 2014). The reliability is maximised by having a clear research framework.

This working paper is a research in progress, based on data collected over a few months, and so presents work in progress rather than our final analysis on the issues of digitalisation of food assistance in India.

2.2 Key areas of exploration

In studying to what extent food assistance and social welfare practices have been digitalised and why, in this exploratory phase of the research, we focus on the three main areas of digitalising food assistance in India: the biometric Aadhaar number, the PDS, and agriculture.

In analysing the effects of digitalising food assistance, we start with Aadhaar, using the Foucauldian genealogical method (Foucault, 1984). The aim of this method is to produce an account of discontinuities, of ruptures and silences, and how power and knowledge are intertwined to make a certain discourse ‘true’. Using secondary literature, both academic and grey, as well as key expert interviews, the working paper examines the key organisations, authorities and businesses involved in the conceptualisation and the implementation of the Aadhaar system of identity.

The second part of this exploratory study examines the PDS, in particular the state’s claims of efficiency and accountability in PDS outreach, against the realities at the ground level. The working paper reports on findings in Delhi state.

With Delhi being the political and administrative power centre of the country, the assumption is that it would have the best infrastructure available, even for marginalised sections of population. Marginalised populations include migrant populations, of which Delhi has the highest share in the country, accounting for 21% in 2021.⁶ The study includes these populations.

Two field sites in two different districts of Delhi were selected, with diverse communities and geographies. The first site is an urban resettlement colony in the North-East Delhi district, with a heterogeneous population of migrants from different parts of the country. Their livelihood is street vending, daily wage-work, waste picking and sorting. It has a population of approximately 600,000 (2011 Census), with high population density, narrow lanes, congestion and overcrowding. There are nine PDS shops located in different parts of the colony and the residents are allowed to collect their allocated ration from any of them.

A contrasting second site is in the rural North district of Delhi. This village has a low population density amounting to approximately 4,000 (2011 Census). Agriculture is an important means of livelihood and wheat, paddy and seasonal vegetables are cultivated. There is a sizeable proportion of migrants who are engaged as farm labour or casual workers. There are no PDS shops in the village and the nearest ration shop is more than 2 kilometres away.

Data was collected from February to June 2024, including semi-structured interviews of four PDS shop owners (three from the resettlement colony and one serving the village in the North district), three PDS beneficiaries and two Delhi state officials, as well as direct observations of the ration shops. Additionally, a member of a non-governmental organisation (NGO) that runs a vocational training centre, who had earlier worked in the Right to Food Campaign, was interviewed. (See Annexure I for respondents' details.) These findings were complemented with a review of the topic as reflected in popular newspapers and a critical review of the literature on the implementation of the PDS elsewhere.

The third part of the exploratory study was to examine the government's assertion that digitalisation of agriculture would lead to the betterment of marginal and small farmers in the country. This is based on the assumption that this category of farmers will be capable – with respect to the use of digital technology – of engaging with online trading and participating in the national and global markets in a meaningful way.

This part of the study is located in the state of Chhattisgarh in central India. Chhattisgarh 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 the

⁶ See: <https://www.statista.com/statistics/1471022/india-states-with-the-highest-external-migrants/#:~:text=Delhi%20had%20over%2021%20percent,over%208%20percent%20share%20each> (accessed 5 December 2024).

national GDP (gross domestic product) in 2023–24 (Sanyal and Arora, 2024: 9). As per the 2011 Census, more than 75% of the population was rural and 30.62% of the population was classified as Scheduled Tribes (ST).⁷ Marginal farmers (owning less than 1.00 hectares) form 60.69% and small farmers (owning 1.00 to 1.99 hectares) form 20.93% of the farming community (Government of India, 2023). As per a national survey, in Chhattisgarh, the average monthly income of rural households for the year 2018–19 was INR 9,677 (US \$114) (Press information Bureau, 2022) less than the national average.

Respondents for the study were selected purposively from twelve villages in three clusters. These clusters were identified on the basis of their distance from district headquarters and their relation to the forest: viz., villages in the plains; villages relocated from forest land; and villages in the forest area. The assumption is that as these villages are far from the administrative headquarters there might be problems with connectivity in terms of roads and electricity.⁸ Using the government classification on landholding, respondents were selected from households that owned less than 2 hectares of land (marginal and small farmers), engaged in farming their plot of land and knowledgeable about output and sale of produce. Efforts were made to include women farmers. Data was collected between April 2024 to July 2024 through a semi-structured questionnaire. (See Annexure I for respondents' details.)

In total 22 people were interviewed, 14 (64%) men and 8 (36%) women; 8 (36%) were above the age of 50 years, 10 (45%) were between the ages of 36 and 50 years and only 4 (18%) were under than 35 years of age. Literacy levels were very low, with 72% having no formal or primary level education and only one person with schooling up to class 10. Seventeen (77%) respondents belonged to households with less than seven members, and two households had eleven and above; 86% respondents belonged to the ST (Scheduled Tribe) category and of them two thirds belonged to the PVTG (Particularly Vulnerable Tribal Groups) category. One respondent belonged to the SC (Scheduled Caste) category and two were from a relatively higher caste (OBC – Other Backward Classes) category. There were none from the General (upper-caste) group. Five households possessed a mobile phone ('button' type). Eighteen households had smartphones with, in some cases, all the adults in a household possessing one. In only one household was the smartphone purchased to attend online classes, but it was no longer working.

See Annexure II for the map of India showing the locations of Delhi and Chhattisgarh states.

⁷ The next census was scheduled for 2021 but has been postponed. The decadal growth rate as noted in 2011 Census was 22.6%. See: Ministry of Health and Family Welfare, <https://pib.gov.in/PressReleasePage.aspx?PRID=1602755> (accessed 21 November 2024).

⁸ Data on the state of connectivity will be collected in the second phase of the study.

3. FOOD SECURITY CONTEXT

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. Since 1947, the Indian state has implemented several food security programmes to deal with hunger. Notable among these are the PDS, which provides subsidised foodstuffs to the needy, a supplementary feeding programme for children under the age of five years and for pregnant and lactating women, and a midday meal programme for schoolchildren up to class 8. Since 2005, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has been providing the rural population with employment as a livelihood support⁹, which is an important food security measure. The PDS and the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) are directed at the household level, whereas the supplementary feeding programmes are directed at sub-groups of the population that are considered biologically vulnerable.

The central initiative of the Government of India has been the PDS, which was launched in the 1950s. The PDS evolved as one of the largest welfare programmes in the world (Puri et al., 2019), providing certain essential commodities to vulnerable populations, including specific food items, at highly subsidised prices. In the 1960s and 1970s, during the Green Revolution, the food security programme was further expanded by providing a minimum support price to farmers (NFSA, n.d.) to encourage them to produce for the market. The Food Corporation of India (FCI) is the nodal agency responsible for procuring, storing, transporting and allocating foodgrains to the state governments. Thus, the objectives of the PDS are to stabilise food prices and support farmers and consumers by procuring foodgrains from farmers at remunerative prices and distributing them to the food insecure through Fair Price Shops (FPS) or ration shops at subsidised rates.

The PDS has undergone several changes in recent decades. Until 1996, the PDS was a universal provision available to all ration card holders, irrespective of income levels (Mulky, 2015). It was critiqued for its failure to serve the entire below-poverty-line (BPL) population, and its lack of transparency and accountability (Mulky, 2015; Pillay and Kumar, 2018)¹⁰. The Ninth Five-Year Plan (1997–2002) declared the universal PDS was 'no longer desirable or sustainable'

⁹ Under this Act, at least 100 days of guaranteed wage employment is provided in a financial year to every rural household whose adult members volunteer to do unskilled manual work. https://nrega.nic.in/MGNREGA_new/Nrega_home.aspx (accessed 5 April 2025).

(Mulky, 2015: 210)¹¹. To focus on the most disadvantaged sections of society, targeting was introduced to narrow the number of eligible households. This also fitted with the neoliberal policies advocated by the World Bank to cut back on social sector spending. In 1997, the Targeted Public Distribution System (TPDS) was launched by the central government and the state governments were asked to identify eligible households according to specific socio-economic criteria. However, TPDS did not deliver as promised and was plagued with problems of mis-targeting, poor food chain management, and diversion of supplies and corruption (Pillay and Kumar, 2018).

In mid-2001, starvation deaths in Rajasthan – despite the existence of substantial government food stocks – led to a writ petition on the ‘right to food’ in the Supreme Court by a civil society organisation (Right to Food Campaign, 2001)¹². In 2013, the right to food was recognised by the Indian government through the National Food Security Act (NFSA). The NFSA shifted the approach to food security from a welfare- to a rights-based approach by giving schemes like the PDS statutory backing. Yet it also reduced the population that would be entitled under the NFSA through the BPL criterion. The NFSA targets BPL households, amounting to two thirds of the total population of the country. It promises a coverage of 75% of the rural population and 50% of the urban population (National Food Security Portal, n.d.)¹³. Eligible beneficiaries are entitled to 5 kg of foodgrains per person per month and under the Antyodaya Anna Yojana (AAY)¹⁴, the ‘poorest of the poor’ are allocated 35 kg of cereal per household per month at subsidised prices (National Food Security Portal, n.d.).

Despite the Indian government’s commitment to the ‘right to food’ through the NFSA 2013, the central government reduced the budget for food subsidy by 32% under the NFSA (Nitnaware, 2023). The robustness of India’s food security programme was compromised once the country moved from universal PDS to a targeted system. The methodology used for classifying those eligible for the ration – that is the BPL households – resulted in exclusion of food-insecure

¹⁰ Below poverty line or BPL is an income-based benchmark used by the Government of India to identify the economically weak sections who need government assistance. Per capita consumption expenditure is the criterion for BPL classification, but it varies by state and area (urban or poor).

¹¹ Although it was universal, ‘the coverage was not universal because the proportion of consumers who bought from the PDS was a modest fraction of the total population’ (Mulky, 2015: 210).

¹² Writ petition (civil) No. 196 of 2001, PUCL vs Union of India and Others, focused on the ‘right to life’ enshrined in Article 21 of the Indian Constitution’. <https://www.righttofoodcampaign.in/legal-action> (accessed 2 December 2024).

¹³ See: <https://nfsa.gov.in/portal/nfsa-act> (accessed 3 December 2024).

¹⁴ The AAY or Antyodaya Anna Yojana is for those BPL households who constitute the geographically, socially and occupationally vulnerable sections of the urban and rural population. Broadly, the eligibility criteria for AAY are family annual income of less than INR 15,000 (US \$177), disabled people, households headed by single women, widows, minors (below 18 years) and senior citizens (above 60 years). Some selection parameters differ between urban and rural areas.

households (Nawn, 2011). The Economic Survey 2011–12 accepted that TPDS has not delivered well and the High-Level Committee on Long-Term Food Grain Policy, under the Ministry of Food and Public Distribution, recommended a return to the universal PDS system (Swaminathan, 2002). It stated that ‘[b]y excluding a large number of families, the TPDS undermined the viability of Fair Price Shops and increased scope for distortion and leakage ... it did not reach the poor in States where the PDS was weak prior to its introduction. We feel that it is essential to go back to a universal PDS’ (Committee Report cited in Nawn, 2011).

The Right to Food Campaign, India, has argued that the NFSA does not ‘provide a commitment to provide everyone in India with a legal guarantee to a full, nutritionally appropriate diet’ (Pritchard et al., 2013: 156, cited in Mitra, 2014). Moreover, the vision of NFSA has been questioned since it promotes privatisation of the PDS by outsourcing procurement and distribution allegedly due to the ‘inefficiency’ of the FCI architecture (Jakobsen, 2018). It is argued that dilution of NFSA by making it targeted as against universal is part of a larger trajectory of neoliberalisation of agriculture and food provisioning (Jakobsen, 2018). The NFSA has been critiqued for its low nutritional value as it is largely cereal based without the addition of pulses and edible oil (Khera and Shomanchi, 2020). Moreover, data from National Sample Survey (NSS) in 2004–5 has shown that, with the TPDS, coverage has reduced in many states of the country and caused exclusion of disadvantaged sections of the population (Pal, 2011) and that it has failed to benefit the targeted beneficiaries as well (Ghabru et al., 2017). Currently, the PDS covers 789.3 million beneficiaries with 195.6 million ration cards in India (NFSA, n.d.).

In India, the agriculture sector and the PDS are closely linked. The PDS, while providing subsidised food stuffs to the vulnerable sections of the population also acts as a means of stabilisation of open market prices for these commodities. This appears to be under threat with the policy to digitalise this sector because, in the last decade, as part of government policy, digitalisation in farming is being promoted as part of a strategy of liberalising and modernising agriculture.

Agriculture and its allied sectors form the largest source of livelihood for 70% of rural households (FAO, n.d.). Yet, farmers form the poorest section of the rural population. This is due to the general neglect of the sector except in regions that were under the Green Revolution. At the national level, marginal and small farmers (with less than 2 hectares of land) account for 86.07% of the total agrarian holdings (Government of India, 2023). As per a national survey, the average monthly income of rural households for the year 2018–19 was INR 10,218 (US \$121) (Press Information Bureau, 2022).¹⁵

¹⁵ ‘Income includes income from wages, income from leasing out of land, net receipt from crop production, net receipt from farming of animals and net receipt from non-farm business’ (Press Information Bureau, 2022: 2). Income, however, varies greatly from state to state with the north-western parts of the country, the Green Revolution belt, being more prosperous; for instance, in Punjab and Haryana the monthly income of rural households is two or two and a half times more than the national average (Press Information Bureau, 2022: 2).

In September 2020, the Indian government passed three bills, popularly known as Farm Laws, to be applied uniformly throughout the country (Ministry of Agriculture and Farmers Welfare 2020). The three laws were said to ‘herald a new era of market freedom’ and urged farmers to adopt smart technology to increase production and maximise profits (Government of India, 2021: 255). They were purportedly meant to address ‘agrarian distress, increase farmers’ income, generate remunerative employment for rural youth, enable Indian agriculture to become globally competitive and transform India’s rural economy’ (Singh and Bhogal, 2021: 2). The Farm Laws were positioned as beneficial and ‘designed and intended primarily for the small and marginal farmers’ (Government of India, 2021: 255), and were allegedly meant ‘purely to empower small farmers’ (K.V. Subramanian, Chief Economic Advisor, quoted in ET Bureau, 2021: n.p.). However, scholars have raised concerns that they pose serious risks to this category of the farming community as they would enhance the process of de-peasantisation by land consolidation and aggravate rural poverty further (Varghese, 2020; Sahay, 2022).

The announcement of the three laws was met with unprecedented protests from the farming community. From November 2020 onwards farmers, particularly from the states of Punjab, Haryana and Uttar Pradesh, gathered in a prolonged sit-in on the borders of New Delhi, the national capital of India.¹⁶ The call for protests was given by the Samyukt Kisan Morcha (SKM – United Farmers Rally/March), an integrated front of more than 500 farmers’ unions from across the country (Key informant Hannan Mollah, 2024)¹⁷. The farmers’ unions argued that the new laws were ‘squarely aimed at consolidating corporate control of agriculture by undermining or eliminating crucial existing protections for food producers’ (Shah and Sandwell, 2023: 8).

On 12 January 2021, the Supreme Court of India put a brake on the implementation of the three laws by issuing a stay order and set up a four-member expert committee to make recommendations on the basis of feedback from the farmers (Kruthika, 2021)¹⁸. On 29 November, the Indian Parliament voted to repeal the Farm Laws and the Farm Laws Repeal Bill 2021 was passed by both the houses (PRS Legislative Research, 2021). For the SKM the repeal was not enough; they agreed to suspend protests if the government agreed to their set of demands. However, since the demands had not been met after three years, the SKM planned to re-start the protests (Key informant Hannan Mollah, 2024).

¹⁶ Accounts of numbers of farmers participating in protests ranged from 300,000 (Ellis-Petersen, 2020) to 2 million (Fyles, 2021).

¹⁷ News outlets have generally tried to minimise the strength of SKM by referring to it as a platform of a mere 40 farmers’ organisations (for instance, see Press Trust of India, 2020).

¹⁸ Rakesh Vaishnav & Ors v Union of India & Ors. Writ petition (c) 1118/2020 challenging the constitutionality of the three farm laws.

Although the government has taken a step back by withdrawing the Farm Laws, it has shown little intent to move towards putting the Minimum Support Price (MSP) on a statutory basis, which is one of the central demands of SKM. Moreover, a popular narrative was being created that a ‘silent majority’, that is, 85.7% of the farmers support the Farm Laws (Suryawanshi, 2022).^{19, 20} Further, even as the protest by farmers on the borders of Delhi continued, the government signed Memorandums of Understanding (MoU) with private businesses to create ‘AgriStack’ (a collection of technology-based interventions in agriculture). These MoUs continue to exist even after the withdrawal of the Farm Laws.

The remainder of this working paper explores the effects of digitalisation in each of these components of food assistance. The following section begins with the conceptualisation and evolution of the Aadhaar biometric identity number. This is because, although initially the Aadhaar number had as its purpose national security, it is now mandatory for accessing all welfare programmes, including the PDS. This section maps the businesses and interests involved in shaping it and discusses some troubling aspects that have emerged over this period. This is followed by examining the operationalisation of digitalisation in PDS, to see how far its alleged benefits – such as improving efficiency and reducing corruption – operate at the ground level. The PDS rests on the grain procurement policy of the government, which forms the first step in the PDS food chain. Agriculture is a sector that is undergoing a major digital transformation and the study explores its potential effect on the farming community, specifically the marginal and smallholders who form the bulk of the producers. The working paper ends with an overall conclusion and looks at the way forward for phase II of the study.

¹⁹ On 21 March 2022, the committee that had been set up by the Supreme Court released its report and recommendations. Anil Ghanwat (The Leaflet, 2022), one of the members of the committee, when releasing the report, stated that the report had been submitted to the Court on 19 March 2021 and, despite him writing to the Court three times, the Court had still not released it. The report had stated that the laws should not be repealed as a ‘silent majority’ of farmers supported the farm laws.

²⁰ That 87.5% of farmers supported the Farm Laws is an exaggerated figure. The committee invited 266 farmers’ organisations but only 73 organisations participated.

4. THE BIOMETRIC AADHAAR: A GENEALOGY

4.1 Chronology of digitalisation

In India, digitalisation of public services began in 1976 with the establishment of the National Informatics Centre (NIC) under the Ministry of Electronics and IT (MeitY) (National Informatics Centre, n.d.). As the technology partner of the Government of India, the objective of the NIC was to provide technology-driven solutions to central and state governments in various aspects of development. However, the major impetus to digitalisation came in 2009, with the initiation of the biometric Aadhaar card for every resident of India.²¹ The Aadhaar identification system has as its objective to confirm the identity of the 1.2 billion residents of India, ‘making it the largest identity management programme in the world’ (Economic Times Bureau, 2010: n.p.). It is a universal scheme under which a 12-digit unique ID is issued to all residents of India²² after collection of their demographic information and biometric identification markings.²³ It is not a proof of citizenship.²⁴

The origins of Aadhaar can be traced to the early 2000, long before its utilisation in welfare services was mooted. Its roots, in fact, lie in the expressed need of the Indian government to secure the country’s borders. Following the Kargil war of 1999,²⁵ the ruling NDA (National Democratic Alliance) government constituted a committee under the chairpersonship of K. Subrahmanyam to ‘review of the developments and recommendations as to the measures to be undertaken to prevent such an occurrence in the future’ (Centre for Land Warfare Studies, 2009). Based on the committee’s recommendations, in April 2000, the government constituted a Group of Ministers (GoM) ‘to review the national security system in its entirety, focusing on external and internal threats, and to formulate specific proposals for implementation’ (Raghavan, 2019: 36, emphasis added). The GoM’s Reforming the National Security System report of 2001 recommended the institution of the

²¹ ‘Aadhaar’ is a Hindi word meaning ‘foundation’ or ‘base’.

²² NA Non-Resident Indian (NRI), whether minor or adult, with a valid Indian passport can also apply for Aadhaar and the residential condition of 182 days is not mandatory. <https://uidai.gov.in/en/contact-support/have-any-question/291-faqs/your-aadhaar/nri-aadhaar.html> (accessed 30 September 2024).

²³ This includes a photograph, ten fingerprints and iris scans of both eyes.

²⁴ The Aadhaar card is neither a proof of citizenship nor of date of birth. See: <https://www.thehindu.com/news/national/government-makes-citizenship-disclaimer-on-new-aadhaar-cards-more-prominent/article67780076.ece> (accessed 30 September 2024).

²⁵ The Kargil war between India and Pakistan was fought from May to July 1999 in the Kargil district of Ladakh and along the Line of Control at the India–Pakistan border.

‘Multipurpose National Identity Card’ (MNIC), commencing with all border districts, to stem illegal immigration and infiltration.²⁶ This was to be on the basis of a National Register of Indian Citizens (Das, 2024).

In 2002, a feasibility study report prepared by the Tata Consultancy Services (TCS) proposed the desirability of a ‘citizen card’ that would combine individual identity with delivery of services and create a national database (Tata Consultancy Services, 2022). This was when biometrics were mentioned for the first time (Key informant Usha Ramanathan, 2024). In January 2009, the Unique Identification Authority of India (UIDAI) was set up by the Government of India as an attached office under the aegis of the Planning Commission and was empowered to collect this data.

In June 2009, the Government of India invited Nandan Nilekani to take over as the chairperson of UIDAI, a position that was equivalent in rank to that of a cabinet minister (Infosys Technologies Limited, 2009).²⁷ Nilekani, the founder of Infosys and director of its Board since its inception in 1981, resigned from Infosys to join UIDAI (Infosys Technologies Limited, 2009).²⁸ At the time of the setting up of UIDAI, the country was ruled by a different coalition, the United Progressive Alliance (UPA).

Enrolment in the Aadhaar process began in September 2010. In December 2010, the National Identification Authority of India (NIAI) Bill was tabled. It had several contradictory clauses. While the bill did not make it mandatory for an individual to enrol with the NIAI, it did not prevent any service provider from prescribing Aadhaar as a mandatory requirement for accessing services (PRS Legislative Research, n.d.). Further, while sharing data was prohibited ‘except by the consent of the resident or a court order’, in cases of ‘national security’, it was allowed ‘if directed by an authorised official of the rank of Joint Secretary or above’ (PRS Legislative Research, n.d.). While ‘no information related to race, religion, caste, language, income or health’ was to be collected, ‘[d]etails of demographic and biometric information to be recorded [were] left to regulations, [empowering] the NIAI to collect additional information without prior approval from Parliament’ (PRS Legislative Research, n.d.). Thus, in effect, it was left to the discretion of the NIAI to decide upon the information to be collected on an individual.

However, the NIAI Bill was rejected by the Parliamentary Standing Committee on Finance to which it was referred. The committee pointed to the high cost

²⁶ See: <https://archive.pib.gov.in/archive/releases98/lyr2001/rmay2001/23052001/r2305200110.html>

²⁷ Cabinet ministers have both executive and administrative powers.

²⁸ Infosys Limited is a global consulting and IT services company that is currently worth US \$18.7 billion (Last Twelve Months Q1 FY25 revenues) company with a market capitalisation of US \$77.31 billion (Infosys, n.d.). The UK connection: Akshata Naryan Murty, wife of Rishi Sunak, former PM of UK, daughter of Infosys founder Narayana Murthy, holds a 0.91% stake in Infosys ‘which is valued at about \$900m (£690m), making Murty richer than the Queen of Britain (£365m)’ (Neate, 2022: n.p.).

involved against its questionable usefulness and raised security concerns in the absence of legislation to protect privacy and the involvement of private actors in collecting sensitive information (Standing Committee on Finance, 2011). The committee recommended that a national data protection law was a prerequisite before any law dealing with large-scale collection of information from individuals and linkages across databases was to be passed. Subsequently there were several legal challenges to the NIAI Bill in the Supreme Court of India, chief among them was that it violated the fundamental right to privacy (Software Freedom Law Center, 2016).

Until 2012, enrolment was projected as voluntary. But then, the government began to make the UID mandatory. The UIDAI Chairperson stated that before he finished his five-year term, half of the population would have to be on the database. And in India, that's a lot. That's like 650 million people. Unless an urgency could be conjured, why would people enrol? So, they started finding different ways by which people could be impelled to get on the database. For the poor, the easiest way was to deny rations unless they were enrolled for a UID and linked their number to the ration system. The message was hardly disguised: 'if you don't enrol, you don't get food'. (Ramanathan, 2021)

In 2013, the National Food Security Act (NFSA) was passed and, the same year, the Indian government launched the DBT programme covering 34 central social welfare schemes (Government of India, n.d.).

Although, the ruling coalition changed following the 2014 national elections, Aadhaar was not dropped; Nilekani was able to convince the new leadership that, by adopting the Aadhaar there could be potential savings of up to INR 50,000 crore (US \$5.9 billion), from plugging leakages in government schemes, including the PDS (Das, 2024).²⁹

In August 2015, '[i]n pursuance of enabling provisions under section 12 of NFSA for cash transfer, Govt. notified "Cash Transfer of Food Subsidy Rule, 2015"'.³⁰ The Supreme Court permitted the use of Aadhaar for the LPG (cooking gas) and PDS schemes but not for any other schemes, and also directed that no one should be denied the benefits rightfully entitled to them for the lack of an Aadhaar card (Government of India, 2017). On 3 March 2016, the government tabled the Aadhaar (Targeted Delivery of Financial & Other Subsidies, Benefits and Services) Bill as a Money Bill³¹ and, within a month, on 26 March 2016, it was notified in the Gazette as the Aadhaar (Targeted Delivery of Financial & Other

²⁹ US \$1 = INR 84.7; exchange rate as on 2 December 2024.

³⁰ See: <https://nfsa.gov.in/portal/nfsa-act> (accessed 5 April 2025).

That strategy for making the UID mandatory [for accessing rations through PDS] didn't work with the rest of the population who did not need to rely on state support for basic needs. In 2016, 2017, it was made mandatory to verify mobile phone numbers using the UID, which meant that everybody had to link their phones to the database to avoid their phones getting disconnected. This was extended to bank accounts and to tax payments. So, from a promise of inclusivity, very quickly it shifted to becoming something that would disable services, freeze accounts and make you a defaulter if you did not comply. (Ramanathan, 2021)

Aadhaar started off as a voluntary scheme, then was changed to a mandatory scheme, initially by piggy-backing on the food security scheme of PDS, and later being required for access to all government social security schemes, as well as becoming necessary for financial inclusion in the formal economy. It is important to note that the whole process unfolded under different ruling coalitions in the centre with differing ideologies. As we shall see, the Indian state, irrespective of the party in power, handed over the conceptualisation of the Aadhaar system to the corporate sector throughout its evolution. This has had serious consequences for its role and functions.

³¹ A 'Money Bill' is 'a bill that contains "only" provisions dealing with one or more of six specific matters. They relate to taxation; borrowing by government; custody of consolidated fund or contingency fund and payment/withdrawal of money from such fund; appropriation out of consolidated fund; expenditure charged on consolidated fund; receipt on account of consolidated fund or public account or the audit of accounts of Union or States' (Rangarajan, 2024). A Money Bill can be passed by the Lok Sabha overriding objections of Rajya Sabha (Das, 2024). When the Aadhaar Money Bill was challenged in the Supreme Court, it was upheld with a majority of 4:1 by the Court (Das, 2024).

4.2 Troubling aspects of the Aadhaar scheme

4.2.1 Entry of transnational businesses and foreign security establishments

This section maps the involvement of businesses and networks, raising questions about their interests in realising the Aadhaar scheme.

In July 2010, after the establishment of the UIDAI and the appointment of Nandan Nilekani as its chairperson, three companies – Accenture, Mahindra Satyam-Morpho and L1 Identity Solutions – were contracted to implement the core biometric identification system for the Aadhaar programme (Economic Times Bureau, 2010: n.p.). These companies' profiles exhibit some troubling features.

Accenture is a global multinational professional services company originating in the US and headquartered in Dublin, Ireland, providing services to a wide array of industries, including aerospace and defence, banking, and capital markets (Accenture, n.d.). Accenture is considered one of the main privatised gatekeepers of US borders (Krishna, 2011). Of the Mahindra Satyam-Morpho led consortium, Morpho is part of the Safran group, a French defence company in which the French government holds 30.5% of the shares (Ramanathan, 2013). The third company contracted by the UIDAI, L1 Identity Solutions, was a company with close ties to the US security and intelligence establishment (Ramanathan, 2013). In July 2010, the UIDAI signed the contract with L1 identity solutions for INR 33.87 crores (US \$3.99 million) (Yadav, 2013).³² A month after signing the contract, L1 Identity Solutions was acquired by the French Safran SA Group (Yadav, 2015) for \$1.09 billion and renamed Morpho Trust (Basu, 2012).³³ With these mergers the UIDAI had not created a competitive environment (Ramanathan, 2013).

The involvement of these companies in establishing the Aadhaar system raises some important questions. These companies' expertise lies in border security and defence, not in the provision of welfare services. Does this indicate that the Indian government's interest in Aadhaar is for border security rather than making its welfare system more efficient and accountable? Could it mean that one of the primary purposes of Aadhaar is security and surveillance? Moreover, these companies are transnational, with close ties to the defence interests of alien countries. Their access to sensitive data through Aadhaar could have implications for national security.

³² Approximately £3 million (exchange rate at 3 October 2024).

³³ Safran is one of the most important manufacturers of Rafale, the French medium multi-role combat aircraft (MMRCA), which was selected by India for a US \$18 billion deal (Basu, 2012).

As Ramanathan (2013: n.p.) puts it, ‘[c]reating a database and handing the data over to companies, and with no discernible protection, should worry a government concerned about the safety of the people and national security’.

4.2.2 Potential for surveillance

Aadhaar is not an ‘identity but an “identification” project’ (Usha Ramanathan, as quoted in Nandgaonkar, 2017: n.p.). As seen from the origin of the Aadhaar concept in the ‘citizen card’, its initial purpose was as a surveillance tool.

In many of the other highly-developed [sic] societies in Europe and North America – and in the view of many computer scientists and policy-makers who study and advocate for policy in this area – using single number identity systems for everything is simply not a good idea. In 2010, the United Kingdom abandoned a similar scheme of a national identity card linked to biometric information. Israel has a smart card identification system with no fingerprints where data is not stored in any centralised database but stays only on the card. The US has no such nationwide, all-encompassing program and only two states – California and Colorado – fingerprint driving licence applications. Biometric information is collected by most of these countries only for visitors but not for their own citizens. Connecting bank accounts and voter registration to biometrics is a trend seen only in China, some countries in Africa, Venezuela, Iraq and the Philippines. (Choudhary, 2018)

Identifying and numbering a country’s citizens and differentiating them from non-citizens by providing them with an identity could be considered a part of the biopolitical project of the state to assess its biomass and biopower. However, the Aadhaar is for all residents and does not authenticate citizenship and therefore its specific purpose in relation to surveillance is not clear. According to Kaliya Young, a leading expert on decentralised or self-sovereign identity technology, ‘[e]ven when identity technology is limited to paper, its abuse could lead to horrific results. IBM’s punch card technology was instrumental in facilitating the Nazi genocide of Jews in Europe via the census records in various countries’ (Young, 2019: 139).

Using one’s Aadhaar number at every point of interaction with the State and private entities leaves a trail of one’s activities, interests, and behaviours in many thousands of databases which can all be interlinked to draw up detailed

profiles. While companies value this type of profiling for its potential to advertise to us and make us consume products, the government can use such profiles to isolate and target those who it feels are inconvenient. Aadhaar numbers have the potential to become a method to interlink previously disjointed data silos and construct everything from your list of associates, your travel history, purchasing habits, location, and more. (Banerjee, 2023: n.p.)

The Aadhaar system can thus be utilised for two types of surveillance: commercial and political.

4.2.3 Problems with securing data and data theft

The Aadhaar system of identification is lauded as the most authentic way of establishing identity as it uses ten fingerprints and iris scan of both eyes. In the PDS system, it is supposed to reduce fraud and corruption by eliminating non-existent users. However, as demonstrated by members of German hacker collective Chaos Computer Club (CCC), fingerprint scanners are not foolproof. They could unlock Apple's new iPhone 5S's 'Touch ID' (an inbuilt fingerprint sensor) by using a fake fingerprint to bypass the phone's security lockscreen, just two days after the device went on sale worldwide (Arthur, 2013). This was done by taking 'a fingerprint of the user, photographed from a glass surface, and then creating a 'fake fingerprint', which could be put onto a thin film and used with a real finger to unlock the phone' (Arthur, 2013). The hackers' team reiterated: 'fingerprints should not be used to secure anything. You leave them everywhere, and it is far too easy to make fake fingers out of lifted prints' (Chaos Computer Club, 2013: n.p.). Frank Rieger, spokesperson of the CCC, stated:

We hope that this finally puts to rest the illusions people have about fingerprint biometrics. It is plain stupid to use something that you can't change and that you leave everywhere every day as a security token ... The public should no longer be fooled by the biometrics industry with false security claims. Biometrics is fundamentally a technology designed for oppression and control, not for securing everyday device access. (quoted in Chaos Computer Club, 2013: n.p.)

Data collected by the UIDAI is stored in an online cloud-based database. In April 2022, an investigation conducted by the Comptroller and Auditor General found that UIDAI had not effectively regulated its client vendors and safeguarded the security of their data vaults (Mishra, 2023). There have been several instances of security breaches and 'leakage' of sensitive data from websites in India.

In October 2023, the Covid-19 portal website of the Indian Council for Medical Research (ICMR) was hacked (Pandagle, 2023), and PII (Personally Identifiable Information) of 815 million Indian citizens (Aadhaar and passport details, including phone numbers and addresses) was put up on the dark web for sale for US \$80,000 (Mishra, 2023). The availability of this data on the dark web was reported by a US-based cybersecurity firm Resecurity (Mishra, 2023). Experts believed that the hackers might demand more than INR 1,000 crores (US \$118 million) in cryptocurrency from ICMR (ETech, 2022). There has been no further information on this from the ICMR or the Government of India. Any compromise of all such databases is essentially irreversible for a whole human lifetime, because no one can change their fingerprints or iris scan, or genetic data (if collected and recorded) in response to a leak (Choudhary, 2018).

Data theft has serious consequences for the individual and the concerned country. For the country it poses a serious threat to national security (IANS, 2013) and for the individual it means the potential for identity theft.³⁴

‘ID theft’ or ‘identity theft’ mainly refers to the crimes that take place wherein a person wrongfully obtains and uses another person’s data. These may include the theft of name, date of birth, unique identification number, bank account number, credit/debit card number, phone number, and so forth, in some way that involves any fraudulent activity or deception. (Chatterjee, 2021: 2)

These crimes could be related to financial and medical matters, government (benefits) or tax, and involve criminal and synthetic identity theft (Subhashini, n.d.). Apart from security breaches from websites, for individuals, security flaws in the mAadhaar app for Android devices have also been identified which could compromise user data, including passwords (Tech2 News Staff, 2018). In India, in 2022, an estimated 27.2 million adults fell victim to this kind of fraud. Further, so far, there is no mechanism to deactivate the Aadhaar number after the death of a person (Sanzgiri, 2023) and nearly 6%, that is, more than 60 million dead people, still hold their Aadhaar numbers (Moneylife Digital Team, 2023). The question then is whether these will continue to be used to receive benefits or be acquired by another person for fraudulent purposes. There have been instances of one individual receiving two Aadhaar cards (Moneylife Digital Team, 2013) or several bank accounts being opened under different names using the same Aadhaar ID (Jha, 2023).³⁵

³⁴ See DiNardi (2023) for the consequences of identity theft.

³⁵ Digital arrest’ is one of the latest form of cyber fraud using an individual’s identity. See: https://www.business-standard.com/finance/personal-finance/crores-lost-to-digital-arrest-scam-here-s-how-to-avoid-falling-victim-124113000374_1.html (accessed 2 December 2024).

4.3 Conclusion

The genealogy of the Aadhaar system demonstrates the link between the state and capital. Since it failed to attract registration as a voluntary scheme, it was made mandatory for accessing rations through the PDS food security programme. Forced registration due to lack of choice in the context of hunger helped create a national database. This imposition was justified on the proposition that it would make the welfare system more efficient by preventing fraud. Thus, hunger, and the associated welfare system, has enabled the widespread acceptance of Aadhaar for a range of purposes other than addressing poverty and food insecurity.

Today, the Aadhaar card has become ubiquitous and although, even now, the government DBT website states that ‘Aadhaar is not mandatory in DBT schemes’. But, it goes on, ‘[s]ince Aadhaar provides unique identity and is useful in targeting the intended beneficiaries, Aadhaar is *preferred* and beneficiaries are *encouraged* to have Aadhaar’ (emphasis added)³⁶, and Aadhaar has, de facto, become mandatory for accessing all welfare benefits. As of January 2024, the Aadhaar enrolment in the country stood at 1.3 billion (FE Business, 2024).³⁷

While this may be one part of the Aadhaar story, the important question that must be answered is, what of its stated benefits? Specifically, have the Aadhaar-enabled digitalised welfare services led to the betterment of people’s lives, particularly those from the poor and marginalised sections of the population, and has it led to the reduction in fraud and corruption in the provision of such services? To explore this, the next section looks at the functioning of the PDS – the food assistance programme that is specifically designed to reduce food insecurity of those categorised as ‘below poverty line’ (BPL) – which was fully digitalised by late 2016 on the basis that it would improve efficiency and reduce corruption.³⁸

³⁶ Direct Benefit Transfer, Government of India: <https://dbtbharat.gov.in/static-page-content/spagecont?id=1> (accessed 29 March 2025).

³⁷ In 2024, India’s population was estimated at 1.4 billion people at midyear. See: <https://www.worldometers.info/world-population/india-population/> (accessed 5 October 2024).

³⁸ See: <https://pib.gov.in/newsite/PrintRelease.aspx?relid=136356> (accessed 29 March 2025).

5. DIGITALISATION OF THE PUBLIC DISTRIBUTION SYSTEM OF INDIA

This section of the working paper examines the impact of digitalising PDS which is the cornerstone of food security policy in India. It particularly refers to the crucial moment of the introduction of Aadhaar and examines the benefits and drawbacks of digitalising PDS. It concludes with plans for a way forward in the next phase of the research.

The state's rationale behind the digitalisation of PDS has centred around efficiency, accountability and transparency, and overall improvement of food security of beneficiaries. From the 2010s, digitalisation caught up with PDS and the entire welfare system was steadily digitalised (Jaspars and Sathyamala, 2021). By 2016, 100% digitalisation of ration cards was achieved (Press Bureau of India, 2016). The state claimed that this has reduced supply leakages and corruption in the food distribution chain, eased access to subsidised grains for the food insecure and also minimised grain wastage (Masiero, 2016; George and McKay, 2019). These assertions are examined by a review of literature, supplemented by some empirical evidence collected in 2024 in two field sites in Delhi state.

The image of competence and responsibility that the state wants to uphold to its citizens is often not matched by the citizen's perception of the government apparatus and agents (Masiero, 2016). Rather than a projected image, citizens 'see the state' through their everyday encounters with the government machinery (Corbridge et al., 2005). The way the poor and the marginalised interact with and experience the state institutions and bureaucracy actively shape how they conceive the state (Corbridge et al., 2007). This is the inverse of Scott's (2020 [1998]) notion of 'seeing like a state', where the modernist state champions science and technology for governance and control of citizens.

In the context of digitalisation of PDS in India, the state uses biometric technology to address the corruption and leakage in PDS and thereby impress the public through its 'efficient' welfare programmes (Corbridge et al., 2005). Masiero (2016) highlights two processes embedded in the use of digital technology whereby the state recasts its image as effective and accountable, whereas the citizens see the state through their interface with government agents to access the benefits of digitalised welfare schemes. In the context of the PDS, the ration shops are the focal points where the beneficiaries collect their free ration after authentication through the Aadhaar linked ration card and thus encounter the state.

5.1 Digitalisation of PDS and Aadhaar seeding

Prior to digitalisation, paper ration cards with details of the household could be used in Fair Price Shops (FPS) by any member of the family, friend, or a neighbour. Digitalisation of PDS was initiated in 2012 at a cost of INR 884 crores (US \$103.4 million)³⁹ (Nair, 2017). It entails computerisation of supply chain management, installation of electronic Point of Sale (ePoS) devices in the shops and maintenance of digital records by them, as well as linking Aadhaar with ration cards (Saini et al., 2017; Privacy International, 2021).

Following the setting up of UIDAI (2010), the Economic Survey of 2011–12 claimed that Aadhaar can remove duplicate and fake ration cards, ensure authentication of beneficiaries and portability and electronic transfer to Aadhaar-enabled accounts. In 2013, the Supreme Court ruled that Aadhaar is not ‘mandatory’ but ‘voluntary’, and that state services to its citizens are not dependent on the possession of Aadhaar (RUPE, 2024), but the state ignored the ruling.

In 2015, the PDS was brought under the DBT scheme, where the cash equivalent of subsidy was to be directly transferred to the beneficiaries’ bank accounts, which are linked to their Aadhaar cards (Sharma and Nair, 2016).⁴⁰ DBT was intended to replace foodstuffs with cash transfers to enable eligible households to purchase foodgrains from the open market (Pal, 2011). But the roll-out of DBT faced problems due to payment failures, lack of computerised records and a digitalised database (Prime Minister’s Office, Government of India, 2013; Department of Financial Services, Government of India, 2019). According to the DBT Mission Cabinet Secretariat (2016), PDS is an in-kind (and not cash) transfer from government to individual beneficiary. This was also the year when AePDS (Aadhaar-enabled PDS) was introduced in compliance with the end-to-end computerisation strategy of the Government of India, and required mandatory seeding of the Aadhaar card with the ration cards of the beneficiaries. This enabled the authentication of the biometrics (fingerprints and iris scans) during collection of rations at the FPS (Gupte and Doctor, 2021). This process was allegedly to eliminate ‘ghost’ cards and make the functioning of FPSs more accountable and transparent.⁴¹ Authentication is done through the ePoS devices at the ration shops, which are linked to access the centralised UIDAI server with its integrated database of the Aadhaar and ration cards of all eligible beneficiaries.

³⁹ Converted at current exchange rate (April 2025) according to xe.com.

⁴⁰ This came about through passing the ‘Cash Transfer of Food Subsidy Rules’ through a Gazette notification.

⁴¹ ‘Ghost card’ is the term used by the Government of India for duplicate cards, or cards for non-existent or dead persons, or those who do not fit the eligibility criteria.

A centralised database is necessary for nationwide portability and de-duplication of ration cards, and, in 2018, the Integrated Management Public Distribution System (IMPDS) was created for this purpose (Kumar et al., 2022). In June 2019, the government proposed the ‘One nation One ration card’ (ONORC) system as part of the digitalisation of PDS. Under the ONORC, migrant workers can withdraw their share of subsidised grains (or cash) from the family ration card anywhere in the country, thereby guaranteeing intra-state and inter-state portability of social security. In 2021, the Supreme Court of India ordered ONORC implementation throughout the country leaving no room for any excuses (Mathur, 2021).

5.2 Entitlements under the NFSA 2013 in Delhi

Though the NFSA 2013 is legislation passed by the central government, there are state-level variations in provisioning of rations and entitlements of beneficiaries. The responsibility for identifying below-poverty-line or BPL⁴² families rests with the state government. In Delhi, BPL households were identified on the basis of two surveys, one conducted in 2005 and another in 2011, on socio-economic status.⁴³

In Delhi, the quota of ration cards was used up by December 2020 and since then no new ration cards have been issued or new family members added to old cards. A total of 7.28 million ration cards have been issued in Delhi (Economic Survey of Delhi, 2016–17). Although PDS has provided subsidised foodgrains since its inception, rations were made free during the pandemic in 2020 under the Pradhan Mantri Garib Kalyan Yojana (PMGKY) (translated as Prime Minister’s Scheme for Welfare of the Poor) (Press Information Bureau, 2020) across the country.⁴⁴ From January 2024, the central government decided to continue to provide rations free of cost for PR (Priority household) and AAY card holders for a period of five years under the Pradhan Mantri Garib Kalyan Anna Yojana (PM-GKAY).⁴⁵ The foodgrain entitlement in the state of Delhi as per the ration card category, is given in Table 1 on the following page.

⁴² BPL is an income-based benchmark used by the Government of India to identify the economically weak sections who need government assistance. Per capita consumption expenditure is the criterion for BPL classification, but it varies by state and area (urban or poor).

⁴³ Some violations were reported by a respondent with respect to this process which will be probed in Phase II of the research.

⁴⁴ See: <https://www.india.gov.in/spotlight/pradhan-mantri-garib-kalyan-package-pmgkp> (accessed 3 December 2024).

⁴⁵ See: <https://dfpd.gov.in/Home/ContentManagement?Url=pmgka.html&ManuId=3&language=1> (accessed 3 December 2024).

Table 1 - Monthly entitlements under different categories of ration cards

Foodstuff	Type of ration card	Quantity
Wheat	AAY	21 kg per card
	PR	3 kg per member
Rice	AAY	14 kg per card
	PR	2 kg per member
Sugar	AAY	1 kg per card

Source: Economic Survey of Delhi (2022–23).

As the capital, Delhi is one of the most popular destinations for migrants from all over the country, so the ONORC scheme has particular relevance here. Official figures show that since the implementation of ONORC in 2021, Delhi accounted for 70% of all ONORC transactions in India (Economic Survey of Delhi, 2022–23). However, the verification process of eKYC (Electronic Know Your Customer) for ration cards requires all members of the household to be physically present, which often creates a challenge for migrants (Shekhar, 2024).⁴⁶ According to the Economic Survey of Delhi (2022–23), there are 1.78 million (Aadhaar-enabled) digital food security cards as at 31 March 2023 in Delhi.

5.3 Pros and cons of digitalising the PDS

Three ration shop owners in the resettlement colony in North-East Delhi (respondents 05L01, 05L02, 05L03), and the one catering to the study village in North Delhi (respondent 06L01) were, in general, found to favour AePDS. For them, digitalisation of PDS has been useful as it has substantially eased the paperwork, and both the long queues and manual work associated with distribution of rations have reduced considerably. They pointed out that it has also benefited the ration card holders since they can now collect rations from any shop and the earlier problem of duplicate cards has been solved by the computerised list. This

⁴⁶ Electronic Know Your Customer (eKYC) is a digital process used to verify the identity of individuals remotely.

opinion was echoed by state officials and non-state service providers, who opined that the entire process of registration, collection and record-keeping of rations has been simplified. The Food Supply Officer (FSO) monitoring the PDS in the Department of Food in Delhi (respondent 06M01) explained that digitalisation has removed the ineligible households from the system and replaced them with 500,000 genuine beneficiaries who have been identified by the government. Yet, contradicting this, another Delhi Food Department official (respondent 06M02) highlighted that people withdraw rations in the name of ‘ghost’ beneficiaries, such as the deceased and married daughters residing in another location.

Difficulties in the authentication of beneficiaries for PDS were noted in the study. To be able to claim their food entitlement, beneficiaries must authenticate their fingerprints or iris scans at ePoS devices in ration shops which are linked to the centralised database for Aadhaar. However, the biometric authentication process is not infallible, and fingerprints may not match for the elderly and manual workers, as noted by two PDS shop owners in the resettlement colony (respondents 05M01, 05M02). When this happens, the iris scanner is used, but that can also fail for people with eye problems such as cataracts, or if they have had eye surgery. In the urban resettlement colony field site, a PDS dealer (respondent 05L03) shared that the server is frequently down, and then a complaint must be lodged with the ration office and customers asked to come back later.

Seth et al. (2023) point out how unstable network connections in villages hinder the smooth functioning of the biometric system. The challenges in the use of AePDS have been attributed to problems with biometric identification, poor power supply and poor internet connection (Saini et al., 2017). Moody’s Investors Service (an international credit rating agency) has clearly stated that the ‘Unique ID system often results in “service denials”, and using biometric technologies in humid conditions is unreliable ... especially for manual labourers in ... [such] climates’ (The Hindu, 2023).

The Comptroller and Auditor General’s (CAG) audit covering the period of 2014–15 to 2018–19 of the functioning of UIDAI found ‘deficient data management’ (Aryan, 2022). It questioned UIDAI’s claim of the uniqueness of Aadhaar and its de-duplication process since by November 2019 the UIDAI had cancelled more than 475,000 Aadhaar numbers which turned out to be duplicates (Srivastava, 2022). This exposes the inefficiency of the UIDAI, which lacks proper data enrolment, self-cleaning and detection-of-leakages packages. Authentication errors, data matching problems where entries in the UIDAI database were not supported with documentary proof furnished by residents and limitations in data archiving have also been raised (Aryan, 2022).

5.4 Leakage and corruption in PDS

A key rationale behind computerisation through AePDS was to curb the corruption and leakages that have long plagued the PDS system (Nawn, 2011). A member of an NGO that runs a vocational centre in North-East Delhi (respondent 05L05) conceded that the re-routing of foodgrain earmarked for rations to the black market has indeed decreased, but other avenues for leakages are unaffected. He revealed that sacks of grain are deliberately left out in the rain to rot and thereafter declared as ‘rotten grain’; subsequently, they are sold to distilleries. According to him, in the resettlement colony, PDS shop owners divert excess rations to chakki shops (flour mills), where they are purchased at higher prices. Out of a total of nine ration shops in the colony, such shops are found adjacent to six and are often owned by the PDS shop owner. Similar shops were not observed near the PDS shop distributing rations to the village in North Delhi.

Misappropriation of foodgrains by PDS shops is one of the many avenues through which rations leak out of the system. Illicit diversion to the private market with higher prices than FPS accelerated after introduction of TPDS, which reduced the customer base and hence the business of the PDS dealers (Masiero, 2020; Masiero and Arvidsson, 2021). The issue of corruption and leakage has singularly disrupted the food chain management and its functioning (Ghabru et al., 2017; Saini et al. 2017), with claims that ‘corruption has become a requirement of economic survival for the PDS dealers’ (Khera, 2011: 1058). However, it is commonly acknowledged that overall leakage has considerably diminished over time (Varadharajan et al., 2014). A PDS beneficiary from the village (respondent 06L03) reported being cheated on his allotted quota of foodgrains and complained that the ration shops often dupe them by purposefully giving them less than they are entitled to. He felt powerless in the face of such fraudulent measures, particularly since he is from a minority community. The ePoS machines installed in every ration shop generate a receipt for the ration card holder which details the amount they are entitled to and the amount that has been withdrawn, but they are seldom given these receipts of sale. A casual wage labourer from the village (respondent 06L02) shared that when ration card holders request the receipt, the PDS shop owner retorts, ‘If you have problem, go collect rations from another shop.’

The quality of subsidised foodgrains for rations did not see much improvement in the new system. A PDS beneficiary who works as a casual wage labourer in North Delhi (respondent 06L02) shared that sometimes ration grains are not edible and have to be sold in the local grocery shop for low prices and good-quality grains purchased at higher prices. Overall, the quality of foodstuff received from the warehouses is below average. A PDS dealer in the urban resettlement colony of Delhi (respondent 05L01) admitted that when they received low-quality grains, one practice is to mix it with the standard grains and then sell to the public.

5.5 Exclusion under digitalisation of PDS

The potential exclusionary effects of the digital ecosystem in PDS have been a matter of concern. In the first phase of the study, PDS beneficiaries were not the focus and only three of them (across two field sites) were consulted, according to their availability as well as suitability. All of them (respondents 05L04, 06L01, and 06L02) reported that it takes too long to get new cards, or add new household members or change their address, despite appealing to government officials and elected representatives. One PDS beneficiary (respondent 06L02), who works as a casual labourer in the village and holds a PR card, received his ration card only a year after applying, but at the time of the interview still had not managed to get all his family members included on the card. He has been trying since 2015 and has visited various officials, including the elected representative, but to no avail. A disabled and unemployed person (respondent 05L04), who had been a casual labourer, has no ration card – the local PDS dealer told him that he is not eligible due to a change in address. Under the IMPDS, if a ration card holder does not collect their ration for three consecutive months, s/he has to go back to their village and get the card updated by the Food and Public Distribution Department; otherwise, his/her card will be deemed invalid, according to the PDS dealer catering to the rural village (respondent 06L01). Findings from a nationwide combined survey and in-depth interviews also claim that one third of the people (around 148,000 respondents) found updating the Aadhaar to be very challenging and 30% of homeless people do not have an Aadhaar card (Totapally et al., 2019). Targeting of PDS and proper identification of food-insecure households have been fraught with errors of exclusion as well as errors of inclusion (Ghabru et al., 2017; George and McKay, 2019). Effectively this amounts to rations not reaching eligible (needy) households as a result of errors of exclusion that severely impact their food security (Himanshu and Sen, 2011; Drèze and Khera, 2015). Instead, it benefits the non-entitled recipients, that is, some of the economically secure population due to errors of inclusion.

The state has not followed the Supreme Court's directive that Aadhaar is not compulsory for food security and many beneficiaries who have not been able to produce their Aadhaar cards at the FPS have been denied their ration (Privacy International, 2021). The process of registering the name of a woman who has married into a family after removing it from her natal ration card is difficult and has resulted in the exclusion of many entitled women from benefiting from PDS in Odisha (Privacy International, 2021).

The current freeze on new ration cards has added to the exclusion of the marginalised from receiving their benefit. The Delhi government had stopped issuing any new ration cards or adding any new names to existing cards because the state's quota had been reached (respondent 05M01). Based on the 2011 Census, the central government had allotted 7.27 million beneficiaries for Delhi,

which had been exhausted for a long while. This freeze on new ration cards, following a government notification, resulted in long list of pending applications. In 2023, a total of 300,000 beneficiaries were on the waiting list for ration cards in Delhi state (The Indian Express, 2023). The High Court ordered the government to scrutinise all pending applicants to check their eligibility to receive allowance under the NFSA, stating that the ‘state government cannot wait till a person gets a ration card’ (The Indian Express, 2023). In 2024, the Delhi government’s Food Supplies and Consumer Affairs Department acknowledged that 1.1 million beneficiaries have been waiting for ration cards for a long time (News18, 2024). The government is planning to undertake a ‘mega cleansing drive’ to delete the names of the deceased, those not collecting rations, those not residing at the correct address, and those who do not require rations and are willing to surrender their card (News18, 2024).

5.6 Conclusion

The observations from the two field sites in Delhi demonstrate that different actors perceive the process and outcome of digitalisation in diverse ways, depending on their position in the PDS management chain. The state officials and the PDS dealers are largely found to favour the digitalised system, despite the operational hurdles in ePoS infrastructure. It has also eased the distribution process for ration shop owners. However, the issue of leakage and corruption has not been addressed, rather digitalisation has opened new avenues for malpractice even while some older practices also continue. The quality of foodgrains has not received a boost with PDS digitalisation. Irregularities in the system are frequently reported across the country in popular newspapers. A widely circulated Hindi newspaper revealed that there are several cases of rations being denied to eligible beneficiaries by FPS in Tundi, in the state of Jharkhand in 2022 (Dainik Bhaskar, 2022a). In the same year, in Garhwa, also in Jharkhand, card holders protested against the PDS shop, alleging that rations were being sold in the black market (Dainik Bhaskar, 2022b). In 2023, police seized a truck loaded with PDS rice, which was on its way to a black market in Bhind in Madhya Pradesh (Dainik Bhaskar, 2023). As recently as May 2024, 850 beneficiaries were deprived of their ration in Garhwa (Dainik Bhaskar, 2024). The central government admitted in June 2020 that 64.4 million ration card holders across the country did not get their due ration in April (Agarwal, 2020).

There is also an urban–rural divide because, with nine PDS shops in the urban resettlement colony, the ration card holders can try the other shops if their ration is not available or if biometric authentication fails in one shop, whereas the beneficiaries in the village are dependent on one PDS shop, which requires them

to commute 2 km and also leaves them with no other choice but to accept the whims of the PDS dealer. Drawing from the experience of the PDS beneficiaries from the primary research, their encounter with the AePDS system has not been very encouraging.

One of the purported objectives of PDS digitalisation has been to tackle the problem of fake ration cards. State officials and PDS shop owners affirm that digitalisation has facilitated the removal of fake card holders from the PDS. This needs to be explored further because newspaper reports state that such practices continue (Hindustan Times, 2019; The Indian Express, 2021, 2023; Deccan Chronicle, 2024). The ONORC system, has also proven challenging for migrants, who are forced to return to their villages if there are any problems with the ration card; this is another issue that will be explored further in the next phase.

In order to do this, the next phase of the research will include interviews with a larger group of beneficiaries. The government has promoted the new system for its efficiency and transparency, but the ground-level realities for the people appear to be different, even on the basis of the limited data drawn on for this working paper. The next phase will also explore if there is a mismatch between the state's projection of a welfarist and populist government and the citizens' impression of the state, and whether the divergence between 'seeing the state' and 'seeing like a state' is exemplified in the digitalisation of PDS.

6. DIGITAL AGRICULTURE IN INDIA: CONSEQUENCES FOR MARGINAL AND SMALL FARMERS

This section examines the potential implications of digitalisation of agriculture with particular reference to small and marginal farmers. It examines the government's repeated assertion that digitalisation will lead to the betterment of marginal and small farmers in the country. This is based on the assumption that this category of farmers will have the skills, in terms of the use of digital technology, to engage with online trading and participate in the national and global markets in a meaningful way. To provide the context, we begin by describing how agriculture markets are regulated in India. This is followed by the findings from the qualitative study carried out among small and marginal farmers from Chhattisgarh. By looking at the economics of production and market interaction, we examine whether it is conducive for them to engage in online trading to accrue the alleged benefits of the free market.

6.1 Regulation of the agriculture market in India

In India, agricultural markets are regulated by Agriculture Produce Marketing Committee (APMC) laws. Under this system, farmers sell their produce to licensed traders and agents through the APMC 'mandis' (wholesale markets) set up by the state governments. Additionally, the state governments set a Minimum Support Price (MSP) on selected main crops so that farmers receive a fair price and are not left at the mercy of traders and agents.⁴⁷ The MSP acts as a check on prices of these crops by controlling the volatility of the market. The government, too, purchases grains at these rates for distribution at subsidised prices through the PDS. The mandis play a critical role because they act as an important check, preventing prices of agricultural products from falling below the MSP.

As part of the liberalisation of the agriculture market, the Indian government is encouraging online trading connecting the farmers and the buyers via digital platforms. These online platforms would provide 'both farmers and traders with direct, electronically enabled channels delivering timely information about

⁴⁷ The number of crops that come under the MSP differs from state to state. But in general the major grains (wheat and rice) are included.

local prices, supply, [and] counterparty records' (Ministry of Electronics and IT, n.d.: 258). By accessing market information online, and engaging in online trading, it is hoped that farmers will be able to sell to the highest bidders from anywhere in the world, presumably at prices higher than the MSP, which would lead to an increase in their incomes. The government plans to facilitate this by removing the restriction on farmers – having to sell their produce to the APMC – so that the farmers can sell their produce outside the state and directly to the buyer without having to go through the APMC mandis. The reasoning is that this would eliminate the middlemen, make markets more competitive, create better returns for farmers' produce, with the farmers selling directly from their farms and thereby reducing transport costs to the farmer (Singh and Bhogal, 2021).

We now look at the findings from the survey carried out in Chhattisgarh; please see section 2.2. for details of some demographic characteristics of the 22 respondents interviewed for the study.

6.2 Landholding and ownership

Most of the people interviewed owned only little land and/or did not have formal documentation, that would be required to be able to make use of a digital marketplace. Of the thirteen (59%) respondents from the marginal category, five (23%) belonged to households with less than 0.5 hectare land and eight (36%) with 0.5 to 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. In seven households, the ownership of land was in the name of respondent, five in the name of father or father-in-law, three in joint ownership (brothers; husband and wife), and two in 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.

6.3 Cultivation, output and sale

Market interaction depended upon the quantum of produce, which depended upon the size of the landholding and irrigation facilities. Thirteen (59%) households

had no irrigation facilities and cultivation depended on the monsoon rains. In six (27%) cases the land was irrigated either by a tube well, or from the canal or the river; in three cases only part of the land was irrigated. Irrigation from tube well, canal or river also depended on the monsoon. Irrespective of irrigation facilities, all households cultivated one main crop of paddy. After harvesting paddy, nine households planted tivra dal (a type of pulse), mustard, batri (a type of beans) or potato. These latter crops were almost all meant for self-consumption and not for the market.

The quantum of harvest also depended upon the size of the landholding and the availability of irrigation facilities. Among the marginal farmers the amount of paddy harvested ranged from 3 to 30 quintals whereas among the smallholders, 84 quintals was the highest quantity reported by two respondents.

Among the marginal landholders, in more than half the sample households (seven out of thirteen), almost the entire produce was kept for self-consumption. In the rest, the amount sold ranged from 2 to 24 quintals. Among the smallholders, while a part of the produce was kept for self-consumption, the bulk was sold. This ranged from 16 to 79 quintals.

Only those who had documentation of land ownership could sell their produce in the mandis. Among the marginal farming households, of the seven that sold part of the produce, two sold in the mandis, one sold it partly at the mandi and partly to a trader, and four sold it to the local shopkeeper or private traders at a much lower rate than at the mandi. Among the smallholder households, information on sale was available for seven, and of these five sold their grain to the mandi but two could not as they were cultivating common land and so did not have documentation of ownership.

Of the fifteen households that sold their produce (paddy crop), information was available from eleven households about income. Net income of four households was between INR 10,000 to INR 50,000 (US \$118 to \$590), in five households it was between INR 50,000 to INR 100,000 (US \$590 to \$1,180). The two households which earned an income higher than INR 100,000 cultivated 2 hectares of land, both producing 84 quintals of paddy each and selling 79 and 69 quintals in the market respectively. However, because the household selling 69 quintals was cultivating common land and had no documentation, they had to sell it to private traders and incurred a loss of approximately INR 41,400 (US \$489).

The net income as calculated by the respondents did not include family labour in terms of wages as costs. In seventeen households, family labour was utilised and of these households three used solely family labour. If the wages for family labour were to be included as costs, then net income would have been far less than reported.

6.4 Access to government welfare schemes

The Indian government provides several welfare schemes for the benefit of farmers. Of these, the Kisan Credit Card (KCC), PM Kisan Samman Yojna (PM Kisan) and Pradhan Mantri Kisan Maan Dhan Yojana (PM-KMY) are meant to benefit small and marginal farmers.

The KCC was introduced in 1988 by Indian public sector banks to provide credit facilities as short-term loans at low interest for cultivation (Bankbazaar, 2024).⁴⁸ PM Kisan was launched in February 2019 to provide financial assistance to all cultivable landholding farmer families across the country in which 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 accounts of the farmers (National Government Services Portal, n.d.). PM-KMY is a voluntary contributory old-age pension scheme for small and marginal farmers who contribute monthly to the pension fund during their working years and the central government provides matching contributions (Ministry of Agriculture and Farmers Welfare, 2024). The recipients will be given a monthly pension of INR 3,000 (US \$35) (after the age of 60) (Ministry of Agriculture and Farmers Welfare, 2024).⁴⁹

Of the 22 respondents, only one had no knowledge of the KCC. 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 successful. The reasons for the low take-up of these schemes will be probed in a follow-up interview. One household (smallholder) had received money from PM Awaz Yojna for constructing their house.

⁴⁸ See <https://sbi.co.in/web/agri-rural/agriculture-banking/crop-loan/kisan-credit-card> for details.

⁴⁹ To enrol in the scheme, eligible farmers need to visit the nearest Common Service Centre (CSC) or contact the Nodal Officer (PM-Kisan) appointed by the state or Union Territories governments. Registration can also be completed through the scheme's official web portal at www.pmkmy.gov.in. The beneficiary needs to provide the following information at the time of registration: bank account number, IFSC/MICR (bank) code, mobile number and Aadhaar number. The link for new applications was not functional on 23 November 2024.

6.5 Opinion on mandis

To a direct question asked about their opinion on mandis, sixteen (73%) of the respondents opined that mandis were important; three felt that mandis were not important and three did not express an opinion. Thus, even respondents who did not sell their produce to the mandis, either because the surplus was too low or because they did not have documentation thought that mandis were essential.

Reactions from some of the respondents on the role of mandis included the following:⁵⁰

Without the mandi, the life of a farmer will become topsy-turvy. Supposing the mandi closes, then what can the farmer do or not do? Where will they sell the grain, what will they do with the grain? One cannot eat all the grain one produces. We will have to sell the grain. The farmer will face a difficult situation if the mandi closes. (Respondent SFL05)⁵¹

The administration [government] has to buy [the grain] because it has given loan to farmers. It [the government] will buy as it has to give rice [grain] to every household. (Respondent KFL01)⁵²

Heavy impact if mandi closes as the shops pay very low rates and the mandi pays proper rates. Shopkeeper pays only Rs15 to 16 per kg. (Respondent KFL03)⁵³

Mandi is necessary. Otherwise farmers will lose out. We have to grow grain because PDS is not enough. (Respondent SFL11)⁵⁴

We are now selling at the mandi and so getting good benefit. If given [sold] to traders [we] will not get the benefit we

⁵⁰ All quotes translated from Chhattisgarhi to Hindi to English.

⁵¹ A 50-year-old woman respondent from a marginal farmer household. They had harvested 13 quintals but kept almost the entire amount for self-consumption.

⁵² A 63-year-old male respondent from a marginal farmer household who sold 24 quintals of paddy at the mandi.

⁵³ A 47-year-old male respondent from a marginal farmer household who sold 14 quintals of paddy at the mandi.

⁵⁴ A 24-year-old male respondent from a marginal farmer household who harvested 9 quintals and sold 3 quintals to a private trader as this was not enough to take to mandi.

should get. In mandi we get the rate, whatever it is, the minimum rate. (Respondent BFL17) ⁵⁵

Mandi is important as else farmers will be in loss because of middlemen. (Respondent KFL16) ⁵⁶

Most of the respondents had little or no knowledge of the Farm Laws, or the demands of the farmers' unions that were protesting against these laws. ⁵⁷

6.6 Conclusion

The findings from this study show that it may not be possible for marginal and small farmers to engage with online trading in any meaningful way. This study shows that, in this primarily rain-fed area, market interaction depends on the size of the farm. In marginal farmer households, the amount of produce (paddy) is so low that bulk of the crop is kept for self-consumption as the amount they receive through PDS is not sufficient to meet the family's needs. Thus, on an average, the farmers in this category are not in a position to generate an adequate marketable surplus at an individual household level and may end up selling the little they have to the local traders, landlords or shopkeepers at a price lower than that at the mandi. Among the smallholders, the marketable surplus may be larger than that of the marginal landholders and they, in general, seek to sell it at the mandis. But this is dependent upon proper documentation of land ownership. In this region, where tribal communities have traditionally cultivated common land, such documentation does not exist for many households and so they are unable to avail themselves of the mandi facility.

Aside from the issue of the quantum of surplus there is the issue of literacy, which is very low; this also applies to the country as a whole where basic literacy is at a 76%,⁵⁸ with only 8% being graduates (Rukmini, 2021). Although many of the households possessed smartphones, given the low literacy levels, the people

⁵⁶ A 47-year-old woman respondent from smallholder family that cultivates 'common' land. They harvested 84 quintals and sold 69 quintals to traders as they do not have documentation of possession. They incurred a loss of INR 41,400 (US \$489).

⁵⁷ Although, according to the government, the APMC will not be dismantled by online trading and that MSP will continue to operate, the farmers unions are not convinced (Shah and Sandwell, 2023). Their fear is that once the big traders and corporate sector come into play as buyers, this will inevitably lead to the undermining of APMC mandis and result in price unpredictability and volatility. Moreover, with the abolition of taxes to be paid to the mandis, the state governments would lose their revenue from them, as well as losing control over the agricultural products in their state.

⁵⁸ See: <https://www.macrotrends.net/global-metrics/countries/ind/india/literacy-rate#:~:text=Adult%20literacy%20rate%20is%20the,a%206.55%25%20increase%20from%202006> (accessed 5 April 2025).

may not be technologically capable of engaging with online trading. Therefore, market liberalisation has little to offer them and, in fact, might have an adverse effect on them. This is because of the importance of the mandi system and the MSP, if indeed the mandi system is dismantled due to the removal of the APMC Act. Even those who do not sell in the mandis are aware of the role mandis play in stabilising prices and preventing distress sales. The dismantling or degradation of the mandi system will therefore affect small and marginal farmers adversely. This will be both in terms of selling for income and buying for consumption, as the cost of essential foodstuffs will go up in the open market. Further, the many welfare schemes for this category of farmers appear to be utilised only minimally by the respondents. The question then is why the government repeatedly asserts that digitalisation of agriculture is primarily meant to improve the economic status of marginal and smallholders. This question will be explored further in the next phase of the research by interviewing government officials overseeing the agriculture sector and the banking sector.

Further, the respondents' knowledge and competence in using online sources will be probed, along with the difficulties in accessing government welfare programmes, which all have a digital component.

Another area that will be explored in the second phase is the digitalisation of land records. The government intends to create an Aadhaar-like unique identification for every land parcel in the country. The initiative is named Unique Land Parcel Identification Number (ULPIN). Each farmer is to be provided with a digital ID to be linked to their personal Aadhaar ID. The data to be collected will include personal details, profile of land held, production details and financial status of the owner.

One further question pertaining to digitalisation in farming is the use of digital technologies related to 'precision agriculture' that is being promoted as suitable for smallholders. None of the respondents had adopted any of these technologies and more data will be collected on their perceptions of these technologies and their reasons for not adopting them.

7 CONCLUSIONS, KEY POLITICAL ECONOMY ISSUES AND WHAT NEEDS TO BE EXPLORED FURTHER

In this exploratory phase of the research on digitalisation of food assistance in India, we have focused on three main areas: the biometric Aadhaar number, the PDS, and agriculture.

The Aadhaar number has become the lynchpin of digital India, playing a central role in e-governance and in accessing social welfare programmes, banking, and mobile services. The need to create a digital identity for citizens that was perceived in 1999, in the aftermath of the conflict at the border, to stem future illegal immigration and infiltration, was expanded by linking it with accessing social security programmes. Initially Aadhaar was touted to be a voluntary scheme but a lack of enthusiasm of the populace to register themselves voluntarily led to it being made mandatory for accessing government welfare services. Thus, although it remains in theory voluntary (as stated on government websites even today), it became compulsory in practice. The strategy of coercion was first tested out on the PDS, the food security programme for the poor. The PDS, which was originally a universal provision, by 2013 had become truncated to a targeted programme, as part of the liberalisation of the economy. The NFSA, passed in 2013, ordained that only households identified as below poverty line (BPL) would be eligible for receiving government benefits.⁵⁹ This meant, that if BPL households had to access the PDS, they had no choice but to comply by registering in the Aadhaar scheme. Failure to do so would exclude them from the PDS and they would be unable to access their allocated foodstuffs even though mandated under the NFSA. While the NFSA categorised populations into BPL and above poverty line (APL), Aadhaar created a further division among these households based on whether their ration card was Aadhaar enabled (seeded) or not. ‘So the public distribution system kept shifting this idea of the public’ (Key informant Usha Ramanathan, 2024). Hence, for precarious households, acquiring an Aadhaar number and linking it to the PDS became critical for combating hunger. The state thus took deliberate advantage of the powerlessness of a marginalised and poor BPL population to compel their registration and forcible inclusion in the digital Aadhaar system.

By forcible registration through the PDS the goal of the UIDAI – to get more than

⁵⁹ Although, the NFSA conferred this critical food security provision as a ‘right’ and not as state largesse in the form of a welfare measure, by not conferring the right on all of its citizens, it divided its citizens between ‘rights-bearers’ and non-‘rights-bearers’. Further, by making it dependent on a ‘BPL’ constructed at a particular point of time, it made a dynamic situation static.

50 per cent of the country's population registered in the Aadhaar system – was achieved. Later, the APL population, including the middle class, was compelled to register by making Aadhaar mandatory for accessing financial services (banking) and mobile connectivity. Today, the Aadhaar number has become ubiquitous. However, it is not clear why the original goal of creating a citizen's identity was jettisoned, because the Aadhaar is a proof of residency, not of citizenship. The more troubling aspect is the involvement of transnational companies involved with border security and defence concerns of alien countries. This appears to be counter-productive to the country's aspirations to protect its borders and sovereignty.

As part of the notion of a digital welfare state, the justification for digitalisation and the wide-ranging application of the Aadhaar system in people's lives, especially those of the poor, has been that it would help welfare services to reach the most needy accurately and efficiently. It was on this basis that the Supreme Court of India waived the issue of loss of privacy because, according to them, the poor did not need privacy as their dignity lay 'in food' (Key informant Ramanathan, 2024). The argument used was that this process would streamline the PDS and increase accountability while also reducing leakage and corruption. The literature review and preliminary findings from two field sites in Delhi state presented in this working paper show that while, at one level, it has streamlined services at the ration shops, it has not really reduced leakage or corruption. Since these inferences are based on scant field data, the next phase of the study will collect more extensive data from these two sites, as well as four field sites in Chhattisgarh, to examine these issues.

Following the success of digitalising the PDS, the government announced the DBT scheme, described as a policy for financial inclusion, which covered 34 welfare schemes. Participation depended on opening a bank account and possessing a mobile number. In this way, the population was coerced to register with the formal banking system. The Pradhan Mantri Jan-Dhan Yojna (Prime Minister's Public Finance Scheme) in 2011 was successful in encouraging the unbanked population to open bank accounts. At that time only 35% of Indian adults had a bank account, which increased to 78% by 2017 (Klapper et al., 2021). However, nearly 21% of bank accounts are inoperative or dormant (Moneylife Digital Team, 2024). Financial inclusion via the formal banking system is said to help individuals and businesses save money, earn interest and access credit. It is also beneficial to the banking sector because: '[i]n a time when banks are struggling to cut costs and increase profit, unbanked populations can create fresh revenue streams and drive profits' (Moneythor, 2019: n.p.). Today, more than 300 welfare schemes, including payment for employment in the MGNREGS, are linked through banks. This is one area that will be explored further in the next phase of research. Specifically, we will examine the ways in which inclusion into the formal financial system has helped transform poor people's lives. Apart from PDS, other food assistance programmes such as MGNREGS will be included in

phase II of the study.

In India, the agriculture sector and the PDS are closely linked. The PDS, while providing subsidised foodstuffs to vulnerable sections of the population, also acts as a means of stabilisation of open market prices for these commodities. In the last decade, as part of government policy, through the introduction of online digital platforms to sell and buy produce, digitalisation in farming is being promoted as part of a strategy of liberalising and modernising agriculture. The farmers' unions fear that opening the market to national and international buyers through bypassing the state regulated APMC mandis could lead to price volatility that would affect both producers and consumers. The government has been particularly emphatic that digitalisation of the agriculture sector would be to the benefit of smallholders and marginal landholders. However, data collected in this study from three field sites in Chhattisgarh has shown that in this primarily rain-fed area, market interaction depends on the size of the farm and marginal farmers are not in a position to generate an adequate marketable surplus, so they are not in a position to take advantage of digital transactions. Precision agriculture, another area based on digital technologies, is yet to be introduced in this region for this category of farmers and the next phase of the study will explore why such technologies are not being adopted by these farmers.

One area that will be explored in the second phase is the digitalisation of land records under project Agri Stack.⁶⁰ In this region, where tribal communities have traditionally cultivated common land, documentation of ownership does not exist for many households and it remains to be seen how the process of digitalising land records would affect them.

⁶⁰ 'Agri Stack is the digital foundation being set up by the government to make it easier to bring various stakeholders together to improve agriculture in India and enable better outcomes and results for the farmers by using data and digital services'. <https://agristack.gov.in/#/> (accessed 3 April 2025)..

Annex 1 – Interviews

List of respondents from Delhi field sites

	Respondent	Code	Date of Interview	Interviewer
Urban resettlement colony in North-East Delhi				
1	PDS dealer, Block 3	05L01	28 February 2024	AD + CS
2	PDS dealer, Block 5	05L02	1 May 2024	AD + CS
3	PDS dealer, Block 1	05L03	4 May 2024	AD + CS
4	Disabled pension beneficiary	05L04	6 April 2024	AD + CS
5	Right to Food Campaign	05L05	12 June 2024	AD + CS
Village in North Delhi				
6	PDS dealer	06L01	23 April 2024	SK
7	PDS beneficiary	06L02	1 May 2024	SK
8	PDS beneficiary	06L03	6 May 2024	SK
9	FSO or Food Supply Officer, Department of Food of Delhi	06M01	12 June 2024	SK
10	FSI or Food Supply Inspector, Department of Food of Delhi	06M02	12 June 2024	SK

List of respondents from Chhattisgarh field sites

	Respondent characteristics			Code	Date of Interview	Interviewer
	<i>Category</i>	<i>Gender</i>	<i>Age</i>			
1	Marginal	M	63	KFL01	7 April 2024	MT
2	Small	M	70	KFL02	24 June 2024	MT
3	Marginal	M	47	KFL03	7 April 2024	MT
4	Marginal	F	45	SFL04	15 June 2024	MT
5	Marginal	F	50	SFL05	15 June 2024	MT
6	Marginal	M	66	KFL06	7 April 2024	MT
7	Marginal	F	31	CFL07	7 April 2024	PC
8	Small	M	48	GFL08	7 March 2024	PC
9	Marginal	M	50	SFL09	7 April 2024	PC
10	Marginal	F	50	SFL10	7 April 2024	PC
11	Marginal	M	24	SFL11	7 April 2024	PC
12	Small	M	24	BLF12	22 June 2024	AB
13	Small	M	68	BLF13	22 June 2024	AB
14	Small	M	60	NFL14	7 April 2024	AB
15	Marginal	F	55	NFL15	7 April 2024	AB
16	Marginal	M	55	KFL16	22 June 2024	AB
17	Marginal	M	60	BLF17	7 April 2024	MM
18	Marginal	F	45	BLF18	7 April 2024	MM
19	Marginal	M	50	ZFL19	7 April 2024	MM
20	Small	M	50	BLF20	7 April 2024	RK
21	Marginal	F	47	BLF21	7 April 2024	RK
22	Marginal	F	35	KFL22	22 July 2024	AB

Marginal farmer: <1.0 hectare

Small holder: 1.0–2.0 hectare

* Although this farmer has approximately 2.8 hectares of land, only 2 hectares are cultivated.

List of high-level key informants

Name*	Category	Date of Interview	Interviewer
Dr Vandana Prasad	Paediatrician and Right to Food campaigner	17 February 2024	Sathyamala and Somjita
Dr Usha Ramanathan	Lawyer who was involved with the Supreme Court case on Aadhaar	19 February 2024	Sathyamala and Somjita
Mr Hannan Mollah	Vice President, All India Kisan Sabha	18 October 2024	Sathyamala

* Agreed to being named.

Annexure II: Map of India



<https://www.mapsofindia.com/>; accessed 7 April 2025.

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