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PRIVACY INTERNATIONAL

Digital Delivery and Data System for Farmer Income Support

An Analysis of PM-Kisan & KALIA Schemes

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Copy Editing by The Clean Copy.
Layout Design by Indu Manohar.

Submitted to Centre for Internet and Society, India.

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ABBREVIATIONS

ABRS	Aadhaar-Based Remittance Service
APBS	Aadhaar Payment Bridge system
AP	Andhra Pradesh
BAO	Block Agriculture Office
CSC	Common Service Centre
DBT	Direct Benefit Transfer
FGD	Focus Group Discussion
IBA	Indian Banks' Association
KALIA	Krushak Assistance for Livelihood and Income Augmentation
KS	Krishak Sathi
LAH	Landless Agricultural Household
MAO	Mandal Agriculture Officer
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
NACH	National Automated Clearing House
NFSA	National Food Security Act
NGO	Non-Government Organisation
NPCI	National Payments Corporation of India
OTP	One Time Password
PDS	Public Distribution System
PM-KISAN	Pradhan Mantri Kisan Samman Nidhi
PFMS	Public Financial Management System
SFSS	State Food Security Scheme
SMF	Small and Medium Farmer
VAW	Village agriculture worker

GLOSSARY

Aadhaar-based remittance service (ABRS) is a real-time payment platform developed by NPCI in collaboration with the Unique Identification Authority of India (UIDAI). It facilitates payment from one Aadhaar number to another number, and from an Aadhaar number to an account number and vice versa.

National Payments Corporation of India (NPCI) is an umbrella organisation, set up with the support and guidance of the Reserve Bank of India (RBI) and the Indian Banks' Association (IBA), to facilitate the retail payment and settlement system in India.

National Automated Clearing House (NACH) was implemented by the NPCI. It is a web-based solution for banks, financial institutions, corporates, and governments that facilitates interbank, high-volume, and electronic transactions which are repetitive and periodic in nature.

EXECUTIVE SUMMARY

This study provides an in-depth analysis of two direct cash transfer schemes in India – Krushak Assistance for Livelihood and Income Augmentation (KALIA) and Pradhan Mantri Kisan Samman Nidhi (PM-KISAN) – which aim to provide income support to farmers. The paper examines the role of data systems in the delivery and transfer of funds to the beneficiaries of these schemes, and analyses their technological framework and processes.

We find that the use of digital technologies, such as direct benefit transfer (DBT) systems, can improve the efficiency and ensure timely transfer of funds. However, we observe that the technology-only system is not designed with the last beneficiaries in mind; these people not only have no or minimal digital literacy but are also faced with a lack of technological infrastructure, including internet connectivity and access to the system that is largely digital.

Necessary processes need to be implemented and personnel on the ground enhanced in the existing system, to promptly address the grievances of farmers and other challenges.

This study critically analyses the direct cash transfer scheme and its impact on the beneficiaries. We find that despite the benefits of direct benefit transfer (DBT) systems, there have been many instances of failures, such as the exclusion of several eligible households from the database.

The study also looks at gender as one of the components shaping the impact of digitisation on beneficiaries. We also identify infrastructural and policy constraints, in sync with the technological framework adopted and implemented, that impact the implementation of digital systems for the delivery of welfare. These include a lack of reliable internet connectivity in rural areas and low digital literacy among farmers. We analyse policy frameworks at the central and state levels and find discrepancies between the discourse of these schemes and their implementation on the ground.

We conclude the study by discussing the implications of datafication, which is the process of collecting, analysing, and managing data through the lens of data justice. Datafication can play a crucial role in improving the efficiency and transparency of income support schemes for farmers. However, it is important to ensure that the interests of primary beneficiaries are considered – the system should work as an enabling, not a disabling, factor. This appears to be the case in many instances since the current system does not give primacy to the interests of farmers. We offer recommendations for policymakers and other stakeholders to strengthen these schemes and improve the welfare of farmers and end users.

◄ *Discussion with farmers and village volunteer in Munagapaka mandal, Andhra Pradesh. Photo Credit: Sameet Panda*

REPORT FRAMEWORK

This report assesses the role of the data system in the delivery and transfer of funds to farmers, who are beneficiaries of the PM-KISAN and KALIA schemes, with a particular focus on Odisha.

We also look at the Rythu Bharosa scheme implemented in Andhra Pradesh (AP) and the processes used therein in the fourth chapter. The AP scheme was analysed, and learnings from its implementation documented. The schemes especially its technological framework and processes were analysed from the perspective of farmers who are the end users of the scheme.

The second chapter narrates the evolution of support schemes for farmers, with a special focus on income augmentation programmes in India, and discusses the intricacies of DBT and the processes associated with it. In the same chapter we delve into different aspects of digitisation, datafication, and data justice, and the roles of these processes in welfare programmes in India. The fourth chapter critically looks at the implementation and delivery challenges of the PM-KISAN and KALIA schemes, and how they interact with each other, as they are similar schemes with synchronised databases. We conclude by discussing various aspects of datafication and implications for rights holders in the future, and offer recommendations for policymakers and other stakeholders, strengthening the same from the perspective of farmers as end users in the fifth and final chapter of the report.

CHAPTER ONE:

Introduction

1.1 Indian Agriculture and the Agriculture Support System

India's agricultural sector has undergone significant changes in the seven decades since independence.[1] This can be observed in the reduction of agriculture's contribution to the national income and the decline in its share of labor.

Still, approximately 70% of rural people rely solely on the agriculture sector.[2,3] But agrarian distress is a persistent issue in the farming sector, with challenges such as small landholding sizes, low productivity, high input costs, debt, a lack of resources such as irrigation facilities, and low market prices for produce.[4] The latest data from the Agriculture Census 2015–16 shows that the average size of operational holdings has decreased from 2.28 hectares in 1970–71 to 1.08 hectares in 2015–16.[5]

The cost of cultivation continues to rise, while crop production and returns slowly increase, leading to a decline in profitability and net returns from farming.[5] In real terms, farmers received lower net returns in 2014–15 compared to 2005–06[6] (Chand & et al., 2017). This has made agriculture an unviable and economically loss-making activity; around half of agricultural households are in debt, with an average outstanding loan per agriculture household at INR 74,121 in 2018, compared to INR 47,000 in 2013.[7]

Several strategies have been adopted and interventions initiated to increase farmers' income, such as increasing productivity, reducing the costs of production, ensuring higher prices, and making direct benefit transfers.[8]

Many of these initiatives have focused on increasing productivity or reducing the cost of production; for example, the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), Soil Health Card Scheme, and Pradhan Mantri Fasal Bima Yojana (PMFBY).

Agriculture subsidies have been critical to agricultural policies. They aim to transfer income from taxpayers to farmers and motivate farmers to adopt new technologies and practices in order to increase productivity[9].

India subsidizes agricultural inputs to keep farm costs low and production high. However, farm loan waivers, previously a popular strategy used to provide support to farmers, are ineffective.[10] Instead, the government has adopted direct cash transfers, such as the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), as income support for farmers and to reduce financial risk due to factors such as low productivity, market fluctuations, and climate variability.[11] The inter-ministerial committee was constituted in April 2016 to examine issues related to the doubling of farmers' income and recommend strategies[12]. Consequently, some state governments have implemented direct cash transfer programmes, such as the Rythu Bandhu and Krushak Assistance for Livelihood and Income Augmentation (KALIA) schemes in Telangana and Odisha, respectively.

1.2. Income Augmentation Programme for Farmers

1.2.1: PM-KISAN scheme as supplementary income support for farmers

PM-KISAN is a centrally sponsored scheme of the Government of India that provides income support to all agricultural landholding families in the country. As part of the scheme, money is directly transferred into the bank accounts of beneficiary farmers across India to stabilise their income.[13] Under this scheme, the central government provides INR 6,000 per year in three instalments of INR 2,000 each to eligible landholding farmers, in April–July, August–November, and December–March.[14] This scheme was introduced in December 2018 on a pilot basis, and rolled out on 24 February 2019 by the prime minister of India. This project aims to cover all farmers with agricultural landholdings in their names, except for the families that meet the exclusion criteria.[15]

1.2.2: State income support schemes for farmers' welfare

Similar to the central government's PM-KISAN schemes, state governments have designed and launched various schemes to support farmers and strengthen the agricultural sector.

1. **KALIA scheme, Odisha:** The KALIA scheme was designed by the Odisha government to speed up agricultural prosperity and reduce poverty among farmers in the state. Small and marginal farmers (SMFs), landless farming families, weak horticultural families, landless rural workers, and tenant farmers (genuine cultivators) are all eligible under various parts

of the plan.[16] The scheme aims to cover all 50 lakh families in the state. Monetary assistance of INR 25,000 per farm family is given over five seasons to SMFs so the farmers can buy inputs like seeds, compost, and pesticides; they may also use the assistance towards labour and other investments.[17] Assistance of INR 12,500 is given to each landless agrarian family for rural allied activities, such as small goat rearing units, mini layer units, duckery units, mushroom development, honey beekeeping, and so on. [18]

2. **YSR Rythu Bharosa scheme, Andhra Pradesh:** The Rythu Bharosa scheme was implemented by the Government of Andhra Pradesh on 15 October 2019. Through this scheme, the state government provides monetary assistance of INR 13,500 per farming family per annum, along with the PM-KISAN instalments. The state government contributes INR 7,500 to this amount and the central government INR 6,000. This scheme includes tenant farmers. This monetary support helps cultivators meet investment requirements during the yield season, and empowers them to obtain quality inputs and services for higher production of their crops.

   This scheme generally includes cultivating landowners irrespective of their land size.[19] These three schemes, which are designed to augment the income of farmers, have broadly similar technological frameworks, wherein a database is created based on existing databases on farmers. These schemes uses both online and offline modes to select or reject eligible beneficiaries as per the scheme indicators. Farmers are verified by various means such as Aadhaar, ration cards, and online land records. The funds transferred to verified farmers are sent through the account- or Aadhaar-based mode. Theoretically, the use of direct cash transfers to identified beneficiaries makes the schemes efficient, fast, and cheap, with limited scope for leakages. However, the implementation of the schemes is mired in various complications and confusion. Aadhaar is used as the primary identifier and database for the verification and transfer of funds under the schemes; the exclusion of beneficiaries due to the mandatory use of Aadhaar is well documented. Under the three schemes, nearly the entire process from registration of the farmers to grievance redressal can only be accessed online. Low levels of digital literacy and poor internet connectivity in regions where these schemes have been implemented are also widespread and well known.

CHAPTER TWO:

DBT, Digitisation, and Datafication

2.1 The Evolution of DBT in India

DBT is a system of transferring government benefits directly to the intended beneficiaries.[20] The primary objectives of DBT are to improve the targeting and delivery of benefits, reduce leakages, and eliminate intermediaries in the delivery of government services[21]. DBT is intended to provide cash transfers, subsidies, and other government benefits to eligible households and individuals, in a transparent and efficient manner.[22]

There are two major categories of DBT schemes: cash transfers to individual beneficiaries and in-kind transfers from the government to individual beneficiaries. In the case of cash transfer schemes, the government transfers cash directly to the beneficiary's account. This includes schemes such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and National Social Assistance Programme[23]. In the case of in-kind transfer schemes, the government gives benefits to individuals through an intermediate agency. Typically, the government or its agent incurs internal expenditures while procuring goods for public distribution, and make services available to targeted beneficiaries. Individual beneficiaries receive these goods or services for free or at subsidised rates.

The DBT system has been implemented for various schemes such as the LPG subsidy, scholarships, pensions, wages under the MGNREGA, fertiliser subsidy, kerosene subsidy, and many more. MGNREGA was among the first DBT schemes in India that acquired a legal mandate, was passed as an act in parliament, and used management information systems and technological platforms claiming to curb leakages and transfer wages directly to the bank accounts of workers.[24]

The DBT Mission was created by the Planning Commission to act as the nodal point for the implementation of DBT programmes. It was launched on 1 January 2013 to transform the delivery services of welfare schemes.[25] The mission aimed to reform the government delivery system by re-engineering

existing processes in welfare schemes for a simpler and faster flow of information/funds, and to ensure accurate targeting of beneficiaries, reduce duplication, and curb fraud.

DBT uses digital platforms, such as the DBT portal and mobile apps, to enable registration, tracking, and delivery of benefits to eligible households and individuals. The government uses the Aadhaar number as the primary identification for DBT schemes to ensure that the benefits reach the intended beneficiaries and to reduce duplication and ghost beneficiaries[26]

2.2 Datafication and DBT

In the context of DBT programmes, datafication refers to the collection, storage, and analysis of large amounts of data on individuals to ensure that the right individuals receive the right benefits at the right time. For DBT, the datafication process typically begins with the collection of demographic information, such as name, age, and address, as well as biometric data, such as fingerprints or iris scans[27]. This information is then used to verify the identities of individuals and ensure that they are eligible for the benefits being provided through the DBT programme. Once the individuals are enrolled, the government uses data analytics to track the disbursement of benefits and monitor the programme's performance[28]. This allows the government to identify any issues or discrepancies that may arise, such as errors in the distribution of benefits or fraud[29]

Datafication enables the government to identify patterns and trends in the distribution of benefits, which can be used to improve the targeting of the program and make it more effective[30]. Additionally, it allows for real-time monitoring of the program, which can help prevent leakages and ensure that the benefits reach the intended individuals[31].

In short, datafication is a key aspect of DBT programs – it enables the government to collect, analyse, and use large amounts of data to identify and target eligible individuals, monitor and track the programme's performance, and improve the targeting of benefits[32].

◄ *A farmer from Rokal village, Nuapada district Odisha who was declared ineligible for KALIA for being a minor. Photo Credit: Sameet Panda*

However, datafied DBT programmes are steeped in multiple issues. One challenge is the lack of infrastructure and digital literacy in certain regions; this can make it difficult for individuals to access and use the benefits provided through the DBT scheme[33] . Another challenge is to ensure that the correct individuals receive the benefits. There have been many instances of fraud and error in the identification of beneficiaries, leading to the exclusion of eligible individuals and the inclusion of ineligible ones[34,35]. The datafication process contains a large volume of data points, all of which need to be captured correctly – mistakes in data points can lead to exclusion[36]. Additionally, there have been concerns about the potential for the leakage of benefits, as intermediaries such as ration shop owners and post office officials, may still be able to divert funds meant for beneficiaries[37]

2.3 Datafied DBT Programme Delivery Mechanism

Major prerequisites for DBT programmes to work include the identification of beneficiaries and digitisation of beneficiary databases; possession of an Aadhaar number and bank account; seeding of Aadhaar and bank accounts with the beneficiary database; and last-mile connectivity/service delivery[38].

The Ministry of Finance, Government of India has mandated the use of the public financial management system (PFMS) of the office of the controller general of accounts (CGA) for payment, accounting, and reporting under the DBT programme. In December 2014, it directed all implementing ministries and departments to ensure that no payments under DBT schemes were processed from 1 April 2015 unless the electronic payment files for such payments were received through the PFMS[39]. The PFMS is integrated with the Bank of India, the National Payments Corporation of India (NPCI), and other banks.

To ensure the fund is transferred to the eligible beneficiary after identification based on the guidelines of the concerned scheme, account details are validated with Aadhaar information. After the validation of beneficiaries, a payment instruction is sent to the PFMS. The PFMS, in turn, maps the accounts of the beneficiaries via the NPCI, which ascertains that the Aadhaar is seeded with the bank account of the validated beneficiary. Money can be transferred through either the core banking system or the Aadhaar-linked bank account. In case money is transferred through an Aadhaar-linked bank account – which is the mode of transfer for the majority of the payment – it goes through the Aadhaar payment bridge system (APBS) system. The NPCI account mapper is the backbone of the APBS. Here, information pertaining to the bank accounts seeded with the Aadhaar number is maintained.

Based on this, the NPCI routes payments to the destination bank, and the credit is accorded to the DBT beneficiary. After successful transactions of each, the system provides a transaction ID – known as the PFMS transaction ID – that is to be maintained throughout the transaction cycle, until reconciliation.[40]

2.4. Digitised Income Augmentation Schemes for Farmers: PM-KISAN and KALIA

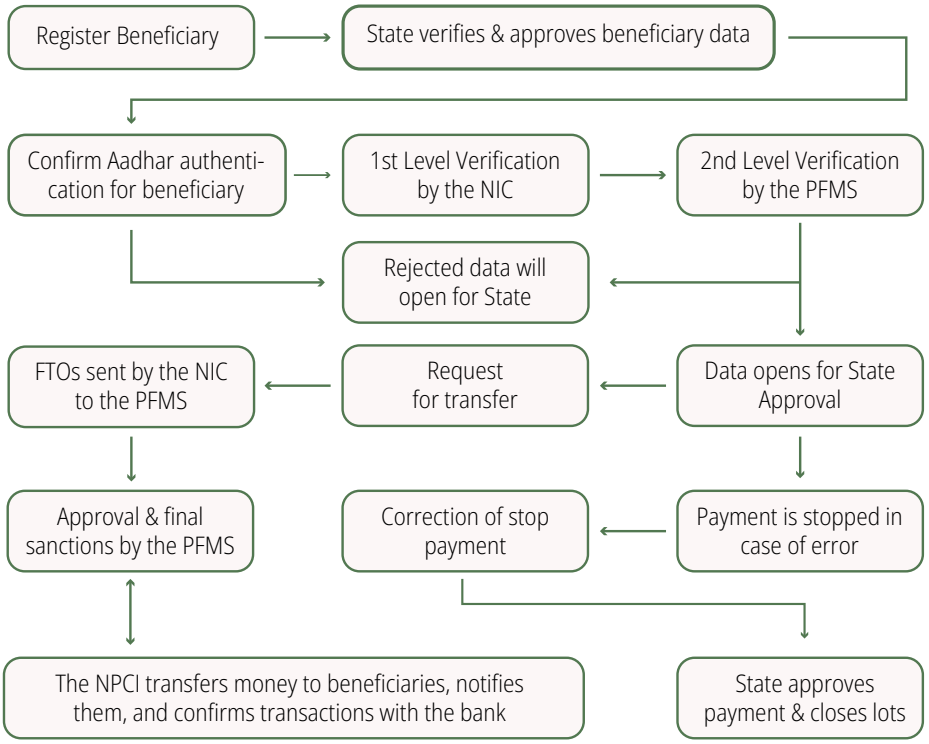
To receive the benefits of these schemes, recipients have to register by providing land records, an Aadhaar number, a valid mobile number, and bank account details. The amount is then directly transferred to the beneficiary's bank account.

First, to access the benefits of the PM-KISAN scheme, eligible farmers must use the online portal to verify the required documents – such as land records of ownership and Aadhaar and mobile numbers for registration. Without this, the registration process will not be successful. This is because the mobile number is linked with the Aadhaar and the bank account through which the beneficiary avails of the benefits. Mobile and Aadhaar numbers have to be linked with each other for the beneficiary to receive the one-time password (OTP) required to register successfully. KALIA follows the same registration process as PM-KISAN.

Second, to know the registration status of the beneficiary under PM-KISAN or KALIA, a person has to enter either the registered mobile number for OTP generation or the registration number – there is no other way to get the information.

Third, the PM-KISAN scheme does not provide an effective grievance redressal mechanism. Currently, the grievance process is available only on the PM-KISAN portal online or the helpline number available on the portal, which seldom works properly. If an individual wants to lodge a complaint they need to have a valid mobile number to receive the OTP or visit the common service centre (CSC). In contrast, the KALIA scheme provides login credentials to the village agriculture worker (VAW) to lodge and redress grievances. Both schemes primarily focus on technology-based redressal systems. However, most people living in villages are not familiar with using technology, so they have to take help from others or depend on CSCs.

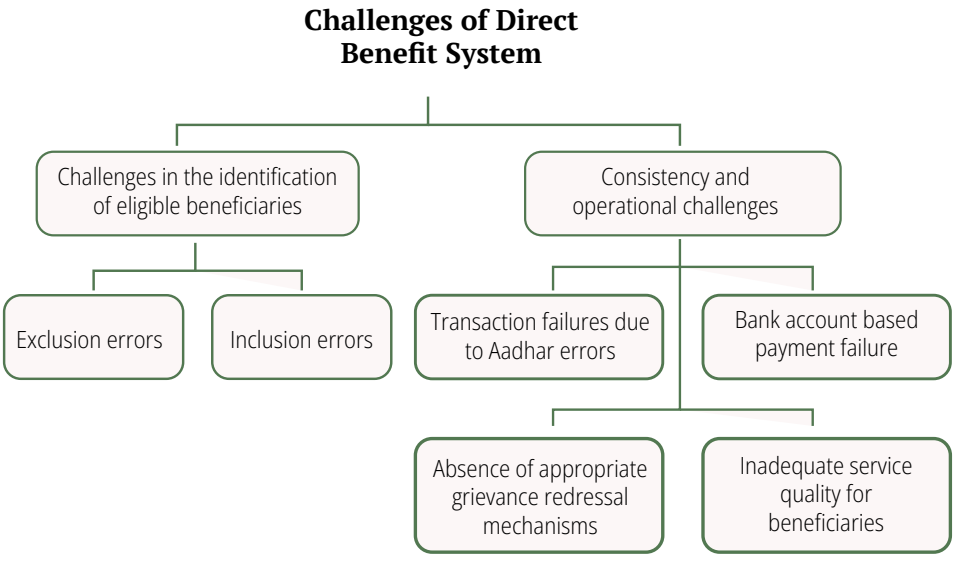
► ***Figure 1*** *Payment process flow in the PM-KISAN and KALIA schemes under DBT. Source: The graphical representation has been extracted from data available on the PM-KISAN portal for payment to the registered beneficiary.*



2.5 Digitisation and Implementation Challenges

The DBT system, which is based on the infrastructure of digitisation and datafication, is theoretically efficient, but faces implementation challenges (Figure 2). Exclusion errors, transaction failures due to database unification, and the absence of appropriate grievance redressal mechanisms are some of the major problems.

► ***Figure 2*** *DBT System and Its Challenges Source:- Sumit kale, Laveesh Bhandari and V. Anantha Nageswaran, "Direct Benefits Transfer: Status and challenges ahead" Indicus Foundation, white paper-July 2021.*



2.6 Digitisation, Datafication, and Data Justice

A stated objective of digitisation and datafication is to ensure transparency. However, practically, it leads to lower participation of citizens and centralisation of the power structure, which are antithetical to democratic values.[41]

The digitisation of data mostly captures economic, demographic, and functional information, but not the contours of diversity, social realities. Ignoring social realities further reduces rights-holding citizens who have a say and right to know about the functioning of any scheme to mere beneficiaries of benefits under the scheme, which can further erode the democratic power of citizens.

Various databases digitise individuals differently and when these databases are unified to deliver services, beneficiaries may get excluded due to mismatches in the datasets[42]. For instance, if the spelling (in English) of the name of an individual (who may be illiterate) does not match the spelling used in their bank passbook or Aadhaar, they might be deemed ineligible to receive the benefits despite being eligible. During digitisation, this event is termed 'error/mismatch' in the name; however, when viewed through the social realities lens, it implies ignoring the identity of an individual.[43] In such cases, the beneficiary is generally not aware of this error and if they get the information they have to accept the name as mentioned in either the bank passbook or the Aadhaar and get the benefit under a particular scheme they are forced to change their name accordingly.

Digitisation of beneficiary databases is more concerned with the reduction of inclusion errors than exclusion errors. The cost of inclusion errors is a wasteful expenditure; however, exclusion errors come with costs to the life and dignity of citizens.[44] Many technocrats casually accept a 5–10% exclusion error rate as necessary during digitisation. But this small percentage adversely affects crores of people who are denied services and benefits due to them. For instance, in the public distribution system (PDS) and pension schemes, lakhs of beneficiaries were declared ghosts or fake, as the system was not able to link their Aadhaar with their bank accounts.

2.6.1.Entangling of digitised databases for estimation, identification leading to exclusion:

Determination of the number of targeted beneficiaries for the KALIA scheme based on the Census 2011 data, and the subsequent revision following the Agriculture Census 2015–16 data, illustrates the estimation methodology adopted. The baseline number of targeted beneficiaries for the KALIA scheme was initially estimated as follows: 30 lakh SMFs, 10 lakh landless agricultural households (LAHs), and 10 lakh vulnerable agricultural households (VAHs). These estimates were based on Census 2011 data, according to which there are 32 lakh SMFs and 24 lakh LAHs in Odisha. However, this target was further revised to 50 lakh SMFs and 25 lakh LAHs, based on the Agriculture Census 2015–16 data on 45 lakh SMF households in Odisha.[45]

The digitised database was unified further to verify the eligibility of beneficiaries and exclude those who were ineligible. In the case of KALIA, the PDS database (ration card details of all card holding families) is integrated into an existing registered database of KALIA beneficiaries to ensure that only one person from each household received the benefit.[46] Ration cards are already linked with the beneficiary's Aadhaar number, one of the mandatory details captured by the PM-KISAN and KALIA databases (KALIA portal). To capture the land holding details of the applicant farmers Bhulekh data (which is the digitised land holding data details of farmers in Odisha) is also linked with the KALIA database. It shows in case of a farmer who applies for KALIA there are multiple databases such as Aadhaar, ration card, Bhulekh, along with the bank account number of individuals linked with each other. For a farmer to get the benefits the details of the persons should be the same in each of the databases, even minor errors – like mismatches in the village names, beneficiary names, or mobile numbers – can result in the exclusion of the eligible beneficiaries. This identification of eligibility based on digitised data and numbers often ignores the inclusion and exclusion criteria determined and notified based on socio-economic criteria.

◄ *A farmer of Rokal village denied access to KALIA scheme due to technical glitch. Photo Credit: Sameet Panda*

CHAPTER THREE:

Methodologies

3.1 Methodology

We undertook a pilot study in the Golamunda block of the Kalahandi district of Odisha. Necessary changes and corrections were made based on the pilot. We conducted the fieldwork for the study in the Munugapaka block of the Visakhapatnam district in AP and the Boden block of the Nuapada district in Odisha.

Over the course of the fieldwork, we explored the processes and challenges associated with registering for PM-KISAN. We delved into the payment-related issues that beneficiaries of the scheme face. We also looked into the Rythu Bharosa and KALIA schemes of AP and Odisha, respectively. Both schemes are similar to the PM-KISAN one, and were launched before the central scheme. The schemes not only have similarities with the central scheme but also form the base database used for selecting beneficiaries for PM-KISAN.

We used a qualitative method to gather information for the study. We conducted semi-structured interviews with different stakeholders. In the context of the study, there were primarily three types of stakeholders: beneficiaries of the KALIA and PM-KISAN schemes, government officials engaged in the administration of the schemes, and people managing the CSC.

► ***Table 1*** *Study Area. Source: Primary Data*

STAGES OF THE STUDY	BLOCK	DISTRICT
Pilot	Golamunda	Kalahandi
Final Field Study	Boden Munagapaka	Nuapada Visakhapatnam

Our primary researcher worked closely with two non-governmental organisations (NGOs) – LibTech India and Rupayaan – during the study. These organisations provided necessary logistical and field support in AP and Odisha, respectively. The blocks and villages were selected based on the suggestions of the respective organisations in both states, where they have

a presence on the ground. Both the NGOs supported us during our fieldwork by arranging focus group discussions (FGDs) and interviews with PM-KISAN beneficiaries in the community as well as organising meetings with local administrative officials in charge of managing the scheme. We held interviews and discussions with the stakeholders of the Rythu Bharosa and KALIA schemes in AP and Odisha, respectively.

1. **Beneficiaries:** We conducted an FGD in AP, and an FGD as well as in-depth interviews in Odisha. Before undertaking the FGDs and interviews, we downloaded pertinent information available in the public domain, on the PM-KISAN portal (names of beneficiaries, online applicant lists, rejected applicant lists, and pending lists). This helped us identify and discuss with beneficiaries and farmers whose registration was pending or had been rejected. Questions were framed accordingly. In AP, we spoke with beneficiaries and applicants in FGDs. In Odisha, we conducted in-depth interviews with almost all beneficiaries in the Putupara village in the Boden block. We also interacted with farmers who were applicants but non-beneficiaries and those who were rejected after registering online. The sample included male and female beneficiaries so we could identify gender-based differences. Gender emerged as a key component shaping the impact of digitisation on beneficiaries.

2. **CSC:** To understand the registration processes the farmers go through, we also interviewed people managing CSCs in Kalahandi.

3. **Government officials:** We interacted with the mandal agriculture officer (MAO) and VAW in AP. In Odisha, we interacted with the Krishak Sathi (KS: a village-level agriculture volunteer), VAW, and block- and district-level agricultural officials. We list the officials we interacted with in the following table.

STATE	STAKEHOLDERS				
	Block-/Mandal-level Agriculture Officials	District-level Agriculture Officials	Village Agriculture Worker	CSC Co-ordinator	Beneficiaries
A.P.	1	0	1	0	2 FGDs
Odisha	1	1	1	2	100 beneficiaries

▲ ***Table 2*** *Sample Design and process of Data collection. Source: Primary Data*

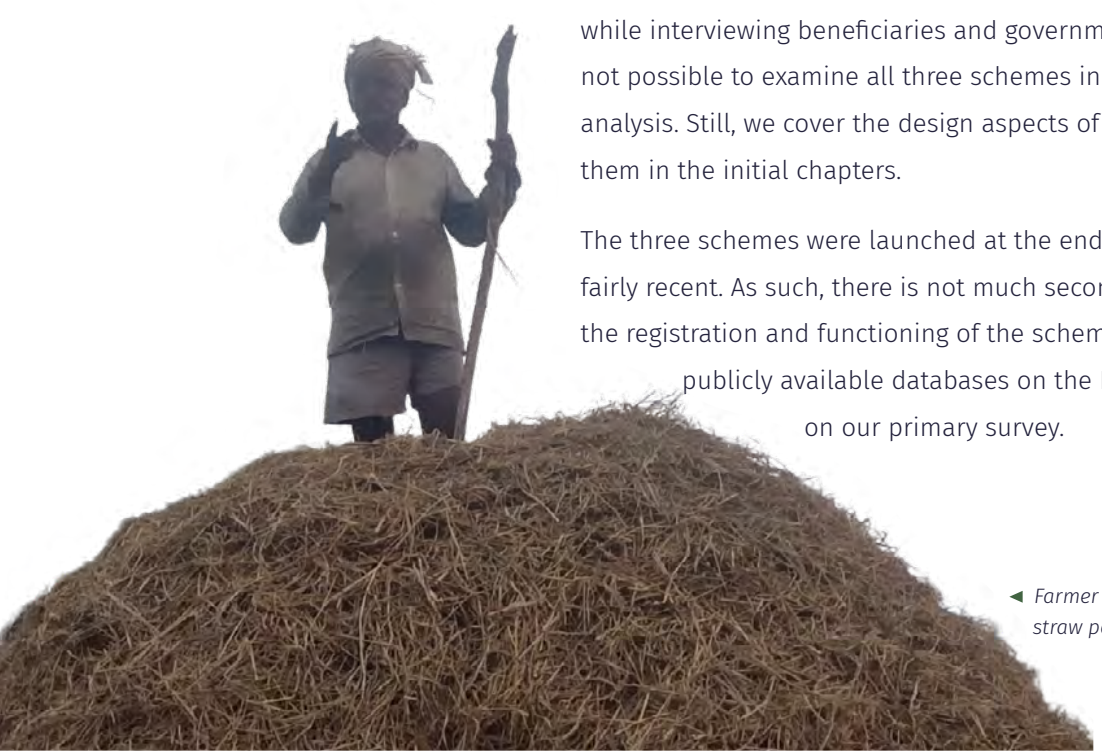
3.2. Limitations of the Survey

First, as already mentioned, the locations for the field survey were not randomly selected but carefully determined based on logistical feasibility. It is not a scientifically representative sample for the schemes we studied. Second, we could not interview similar numbers and types of stakeholders in both states primarily because of logistical and time constraints of the supporting organisations. Third, to interview beneficiaries, we had to follow different strategies in AP and Odisha in terms of mode of interview; it was focus group discussion in AP whereas it was primarily interview in Odisha. This was because of language barriers and the availability of time of the supporting organisations. Fourth, we were not able to interview district-level officials managing the PM-KISAN scheme in AP; these people may have given us more insight into the administration of the scheme. Fifth, we were not able to contact the state-level officials responsible for the administration of the scheme in both states. Since it is a centralised scheme, with state officials having a say in the matter and being in direct communication with central government officials, we could have gained more clarity on the functioning of the scheme.

Originally, we wanted to look at various aspects of the scheme – from registration and validation to fund transfer – in detail. However, over the course of the study, we found that we did not have enough time to cover all these aspects. Therefore, we limited the scope of the research to the experiences and challenges associated with registration processes from the perspective of beneficiaries.

The study explores the Rythu Bharosa and KALIA schemes and compares them with the PM-KISAN one. We conducted investigations of both schemes while interviewing beneficiaries and government officials; however, it was not possible to examine all three schemes in detail during the fieldwork or analysis. Still, we cover the design aspects of all three schemes and compare them in the initial chapters.

The three schemes were launched at the end of 2018 and early 2019, and are fairly recent. As such, there is not much secondary literature available on the registration and functioning of the schemes. Thus, we had to rely on the publicly available databases on the KALIA and PM-KISAN portals and on our primary survey.



◄ *Farmer from Munagapaka, AP arranging paddy straw post harvest. Photo Credit: Sameet Panda*

CHAPTER FOUR:

Findings & Observations

In the case of the KALIA scheme, the list of eligible farmers was to be shared by the state government with the district collectors in the first week of January 2019.[47] As per the different government orders and interactions with officials, we learned that the first list of eligible farmers was shared with the districts on 2 January 2019. Between 2 to 10 January 2019, the list of eligible SMFs was displayed at the panchayats and primary agriculture credit society (PACS).[48] Those whose names did not appear on the list were asked to apply through a standard form called the 'green form'. Meanwhile, those who were not eligible but whose names appeared on the list were asked to submit a 'red form' for exclusion[49] (KALIA scheme guideline 2019). The first instalment for the first phase for SMFs was disbursed on 25 January 2019.

The window for the application was short between 2 to 10th of January 2019; all the farmers flocked to the panchayat office with their documents, completed applications, or green forms. All the details were sent to the block agriculture office (BAO) or block development office for uploading onto the portal. Officials at the block level were of the view that they were hard-pressed during the application period; this led to several errors during the data entry process. This resulted in the improper entry of records, some documents not being uploaded, and other errors, which manifested in the exclusion of and pending disbursal of instalments to eligible farmers. When the scheme was launched at the end of 2018 and rolled out within two weeks, farmers were only required to submit their account details, Aadhaar, land records, address, and number of family members. The first two instalments were transferred based on the bank account details, but then the state moved to Aadhaar-based payment transfer from third instalments onwards by the end of 2019. This new process required the Aadhaar number and bank account to be linked. Further, to ensure that not more than one family member got the scheme benefit, farmers had to submit their ration card details.

4.1. Findings

4.1.1. Exclusion from the KALIA scheme

We came across multiple reasons for exclusion while interacting with farmers. Exclusions primarily occurred in the KALIA scheme, and since the KALIA database is linked to the PM-KISAN one, those who were excluded from KALIA were automatically excluded from the central scheme.

In this section, we list the types of exclusions due to anomalies during the registration process.

4.1.2. Insufficient documents

We found cases where eligible farmers were rejected, with the reason for rejection being "insufficient documents". Tikesundar Majhi, a farmer from Putupara, applied for KALIA through the panchayat office and submitted the necessary documents. He got his first instalment on 21 February 2019 but has not received further instalments. Upon checking his KALIA details, we found that the reason for rejection was "applicant details are insufficient". When asked, he was not aware of the reasons for rejection. He claimed to have submitted all the necessary documents to the local KS a year back but had still not received the pending instalments. He checked with the KS a few times and was assured that the instalments would be sent soon. He had not contacted any other officials about this. He was not aware of the online grievance redressal system and portal. We observed and identified multiple such cases in the villages.

4.1.3. Applicant wrongly mentioned as a minor

We came across this peculiar issue in the Rokal village, where adult farmers – most of them more than 40 years of age – were rejected from KALIA. The reason given for ineligibility was "applicant is a minor". One such person was Harihar Sabar. According to his Aadhaar, his date of birth is 15 July 1955, which meant he was 67 years old at the time of the survey. He had also been receiving a pension. We could not ascertain the reasons for him and others being declared minors. He did not know the reason for his rejection but informed us that he had raised the issue of not getting the KALIA instalment with the VAW and that it was being addressed. It was possibly due to an error by the local officials or a technological glitch. Since Aadhaar is one of the base databases used for KALIA, we are unsure of the reason for the error in this case.

4.1.4. Resides in an urban area

We came across another issue where the application of one farmer was rejected because the "applicant resides in an urban area". Babulal Dharua, a farmer who resides in Putupara, had been declared ineligible for this reason. He was only aware that he was not receiving KALIA instalments but not of the reasons for the rejection of his application. He had approached the KS but without any success. He was also unaware of how to check his details on the KALIA portal.

4.1.5. Another member of the family receives benefits

We came across multiple cases of farmers being denied KALIA benefits because "another member of the family has received benefit". Ahalaya Dharua, a female farmer from Putupara, had applied for KALIA through the panchayat. She received her first instalment on 21 February 2019. However, she had not received any further instalments and been declared ineligible. We checked her ration card, which listed Bira Dharua as her son. When we checked his KALIA details, the portal said his details were either unavailable or that he was not a beneficiary. Since Dharua was declared ineligible because someone else in the family was receiving benefits, but the people listed on her ration card were not actually receiving the benefits, it was not clear why she was declared ineligible. She had informed the KS about her KALIA instalment being discontinued but had not received any support.

4.1.6. No ration card

We came across multiple cases where the KALIA benefits were denied to eligible farmers for not having a ration card. Indeed, they were eligible for ration cards and had applied for them, but had not got them yet. Under the KALIA guidelines, not possessing a ration card is not an exclusion criterion.[50] However, this has not been the case in reality. Moreover, the ration card applications of several farmers have been pending with the state government for quite some time. Ujwal Singh, an SMF from Putupara, had applied for KALIA through the panchayat. His application was rejected because he did not have a ration card. He was of the view that he had applied for a ration card for a long time but is yet to get it. He claimed "I am eligible to receive a ration card but is yet to get it and that is not my fault and it should not be the reason for denying me of KALIA."

4.1.7. Applicant had filed a red form

According to the KALIA guidelines, when an ineligible person's name appeared in the KALIA beneficiaries list they were expected to fill up the red form that was available at the Panchayat or PACS for exclusion of her/ his name from the list. The form was also used by the government officials to reject the ineligible farmers.[51]

We came across multiple cases of eligible farmers being rejected from the benefits of KALIA; the reason for exclusion was that the "farmer filed red form". Indramani Chinda from Putupara had applied for KALIA through the panchayat but did not receive any instalments. He then lodged an online grievance on 11 January 2020, which was rejected. The reason mentioned on the portal was "applicant filed red form". He claimed to never have filed a red form; he was not even aware of the existence of the form. It is clear that many farmers are rejected because of something they never did.

4.1.8. Rejected for being a big farmer

Historically, there has been a lag in land settlements and the digitisation of land records in the names of farmers who are presently tilling the land. During our field visit, we observed that land records were still in the names of the farmers' grandfathers and even great-grandfathers. In such situations, farmers are allowed to apply for and get KALIA benefits if they quote the plot number they are presently occupying. However, we came across cases of farmers being rejected after being declared 'big farmers' on the portal. Under KALIA, all farmers with more than five acres of landholdings are considered big farmers and excluded from the scheme. Gundhar Sabar, a farmer from Rokal who tills 2 acres of land, had applied for KALIA but was rejected for being a landholder of 12 acres. However, he showed us land records where the names of five of his brothers were mentioned. He had lodged an online grievance but had been rejected again on the same grounds. He was not sure whom to approach next.

4.1.9. Pending grievances

We came across multiple cases of online grievances pending at the VAW level. After farmers applied through panchayats, their applications got rejected or were declared ineligible even after they had received one or more instalments. In these cases, farmers had the option to lodge grievances online. Online grievances have four levels, from the VAW to the district collector. We found grievances to be pending at the VAW level in many cases, leading to farmers being denied KALIA benefits. Somanath Dharua, a farmer from Putupara, applied for KALIA through the panchayat. When he did not receive any instalments he lodged a grievance following the suggestion of the KS. The grievance was pending with the VAW at the time of the survey.

4.2. Observations on the Ground

4.2.1 Awareness of the scheme

From the interviews and FGDs with the farmers, we observed that the awareness among the farmers of the various aspects of the KALIA scheme was limited. They only knew about the types of documents they were expected to submit and the amount of money they were entitled to receive once they became beneficiaries. Most farmers from Putupara and Rokal applied through the panchayats and were dependent on the offline process through panchayats only. We did not find even the young farmer being able to manoeuvre the KALIA portal and check their statuses. They only got to know they had been excluded from the scheme because they did not receive the money. Even though most people receive SMS updates from banks, it has been difficult for farmers to get their account statements or bank passbooks updated to confirm receipt of the money due to crowding at banks. The KS is the only source of information however, since one KS is responsible for hundreds of farmers it is not possible for them to support and clarify individual farmers' questions and concerns. This leads to corruption – the KS asks for money to update a farmer's details or to provide any other support.

During a discussion, a farmer shared that getting benefits under the scheme is like winning a lottery: you apply for it when you are told and feel lucky if you get the benefit; if not, you forget about it and move on. This illustrates the helplessness and lack of awareness among the farmers.

4.2.2 Communication from the state

KALIA is one of the first schemes in Odisha, under which such large-scale direct cash transfers to such a huge number of people were undertaken. It is essential for farmers to be prepared for the process through communications from the state. However, our discussion with the farmers suggests that the information they received was limited to the money to be transferred and the documents to be submitted.

For the first two instalments, most farmers received the money without submitting most of the documents as long as their names and account details were correct. When it came to the third instalment there were scores of rejections for many different reasons – a mismatch between the name on the bank account and Aadhaar, a lack of sufficient documents, and a lack of NPCI mapping of the account. There was no effort on the part of the government to sensitise people to the process. Farmers were treated merely as applicants and not rights holders who have the right to know about the details of a scheme they may be entitled to and where state is responsible

and accountable to ensure that not a single eligible farmer is excluded from the scheme.

4.2.3 Increasing documents: A constant worry for farmers

There has been regular change and instructions from the government regarding submission of various documents from farmers. Initially farmers had to submit names, account details, and land records. which is now expanded to Aadhaar, ration card details, mobile numbers, updation of electronic know your customer (eKYC) information etc.

Each time there is a change in the system beneficiaries have to re-submit their documents. For instance, in 2023, only submitting hard copy of the documents is not enough. Indeed, farmers are also required to upload their documents online through CSCs. We came across an issue in Putupara, where members of the CSCs visited the village to update the eKYC of the beneficiaries in the middle of the night since that was the only time the portal was active and the internet stable.

4.2.4. Lack of effective grievance redressal mechanism

We have listed multiple grievances of KALIA beneficiaries. But despite this, there is no accessible, comprehensible, and effective grievance redressal system for the farmers. The KALIA scheme has an online grievance redressal system on its portal, but the system generally becomes operational only one month before the disbursal of the instalment (KALIA portal); the rest of the time it is not open to beneficiaries. We did not find a single farmer who had clarity on the online grievance system. This has pushed farmers to depend on the local CSCs or KS. We came across multiple farmers who had approached the KS for help with redressing their grievances but nothing had been resolved for many even after they paid the sum they were asked for. Many farmers visited the BAO with their grievances but were asked to visit a CSC instead.

A person in charge of KALIA and PM-KISAN was of the view that there are not enough people to look into the grievances of the farmers. The overreliance on technology, when the primary stakeholders do not have access to and knowledge about the system, has left farmers to fend for themselves. Many farmers have stopped filing grievances altogether.

4.2.5 Constraints of the shared database restricting guideline

We have already mentioned that PM-KISAN is based on the KALIA database; we learned this during our discussion with district-level officials and observations of the beneficiaries. During our field visit, we noted that all farmers who were not KALIA beneficiaries did not receive PM-KISAN benefits either. The intertwined databases have created difficult situations for farmers which even violate the guidelines.

4.2.6. Ration card conundrum

The PM-KISAN and KALIA schemes do not necessarily require farmers to have ration cards. The KALIA notification issued on 22 December 2018 defines a 'farm family' as a farmer, their spouse, and dependent children.[52] In the frequently asked questions in KALIA portal, point 1 defines a farm family as "all members of a family with the same ration number" but point 22 does not mention ration number.[53] PM-KISAN, as per the revised operational guidelines, defines a farmer's family as "a family comprising husband, wife and minor children who own cultivable land as per land records of the concerned State/UT".[54]

During the survey, we found that none of the eligible farmers without ration cards who had applied for KALIA had received the benefit. Indeed, they were specifically declared ineligible for not having ration cards. We believe the issue arises because a ration card is now used as a base document for the family unit. But the ration card requirement was introduced after the disbursal of the first two instalments under the scheme. The initial application form or the green form did not ask for the ration card details of applicants. But the state government has now linked the ration card database with the KALIA one. We could not ascertain whether it includes beneficiary databases of both the National Food Security Act (NFSA) and State Food Security Scheme or only that of the NFSA.

If we go by the guidelines of the scheme, all the farmers who have not received ration cards but are eligible for KALIA have been wrongfully denied. The technological framework for the implementation of the scheme does not have the necessary flexibility, leading to the denial of benefits to scores of eligible farmers.

4.2.7. Urban dweller not deemed a farmer

One of the exclusions[55] criteria of the KALIA scheme is "beneficiary belongs to urban local body", whereas, under the PM-KISAN scheme, there is no distinction between urban and rural cultivable land. During the survey, we discovered that a farmer's application was rejected under the KALIA scheme because the "applicant resides in urban area".

This is where the schemes differ in terms of the eligibility and exclusion criteria. When the databases of both schemes were synchronised, all urban-dwelling farmers in Odisha were automatically rejected even though they were rightfully entitled under PM-KISAN. The technological framework must be updated to accommodate nuances and differences between the schemes.

4.2.8. Size of landholding

SMFs with less than five acres of land are eligible for KALIA but large farmers are ineligible. When it comes to PM-KISAN, as per the revised guidelines, farmers are eligible irrespective of the size of their landholding. Therefore, even if large farmers are denied KALIA, they should not be disallowed from the PM-KISAN.

4.2.9. Pending applications

The registration process for PM-KISAN has gone through two major stages. First, beneficiaries registered under KALIA became eligible for PM-KISAN and received the instalments. Second, those left out of the process for any reason were asked to register online through either CSCs or self-registration. In Putupara and Rokal, we found that the online registrations were either pending or rejected; not a single application had been accepted. In the case of individual farmers who had applied for PM-KISAN online, the portal showed that the application was pending approval at the sub-district or block level. A random check of online registration processes in different villages across districts showed similar results. When we checked with the district-level officials responsible for PM-KISAN in the Kalahandi and Nuapada districts, they were of the view that the pending online registration for the scheme was yet to be looked into for the eligible farmers. Officials gave no clear reasons for this.

4.2.10. Differential official access

Our discussion with the block -and district-level officials in the agriculture department suggests there is a difference in the way login access is provided to officials in both schemes. In the case of KALIA, the VAWs have login access. Therefore they can view the status of applications and grievances and make necessary action at their level. In the case of PM-KISAN, login access is provided only up to district-level officials; even the block-level officials do not have access. It is noteworthy that for the majority of online applications, approval is pending for the central scheme at the block level.

We could see a clear difference in understanding of the schemes among block- and lower-level officials. They could respond to most of our queries and speak on intricacies of the KALIA scheme, but they lacked sufficient

information on PM-KISAN, especially the new developments. This has led to farmers going with their grievances to the BAO; at this point, they are generally asked to update their eKYC information or file grievances at a CSC. We found that restricting the login access of block- and lower-level officials has reduced the interest of the officials in ensuring effective implementation of the scheme.

4.2.11. Lessons from the Rythu Bharosa scheme in AP

We visited the Munugapaka block of the Visakhapatnam district in AP. With the support of team members from LibTech India, we spoke with local agriculture officers responsible for managing the scheme as well as local farmers. We also discussed the schemes with the LibTech team, which has been working on various DBT schemes in addition to PM-KISAN and Rythu Bharosa.

The Rythu Bharosa scheme was started on 15 October 2019. It is one of the Navaratnalu schemes, announced by the Chief Minister YS Jagan Mohan Reddy's in October 2019. The Rythu Bharosa scheme aims to augment income support for SMFs and landless tenant farmers' families. Beneficiaries under the scheme are entitled to INR 7,500 every year, transferred in two instalments.[56] The scheme has a management information system similar to those of KALIA and PM-KISAN. Under it, agriculture officials till the village level have login access for the management and redressal of grievances. Mandal- and panchayat-level officials regularly receive online applications and grievances from the district and state levels for early redressal. They have formed a WhatsApp group for this. When it comes to PM-KISAN, login access is granted to the MAO. However, unlike PM-KISAN in Odisha, online registrations for PM-KISAN are regularly reviewed and approved by the MAO. The number of pending applications was minimal.

The state government of AP has appointed volunteers to support families in an average ration of 1:50. Volunteers are tasked with sensitising and redressing the grievances of the families they are in charge of. This has made the process smoother and grievance redressal faster. The volunteers are also the go-to people for the farmers in case of any confusion or difficulties they may face while accessing the scheme.

Farmers were aware of technicalities of the scheme like the NPCI mapping of bank accounts, Aadhaar-enabled payment system, need for eKYC, and possible reasons for rejected payments.

CHAPTER FIVE:

Discussion & Recommendations

There are two major issues we would like to discuss further: the digital reality of primary beneficiaries and the role of the state in addressing the gaps and the rights-based framework in the digitised social protection programme.

5.1 Digital reality and digitised social protection programme

There has been a substantial increase in internet penetration during 2010-2020 in India, primarily driven by increased smart phone ownership. This has helped build digital awareness among the masses.[57] The existing large social protection programmes, like PDS, are now highly digitised and primarily founded on the Aadhaar-based technological framework.[58] Whether it is PDS or others examined in this report, these schemes are increasingly relying on technology for the registration and delivery of services, as well as the lodging of grievances.

In the PM-KISAN scheme, for example, the registration process is completely online. Eligible farmers are now faced with multiple challenges, such as needing to understand a system which is completely digital and indeed few people in their community can grasp.[59] Operating a mobile phone or playing a YouTube or Facebook video requires different skills to those necessary to understand the intricacies of a scheme and be able to manoeuvre a portal.

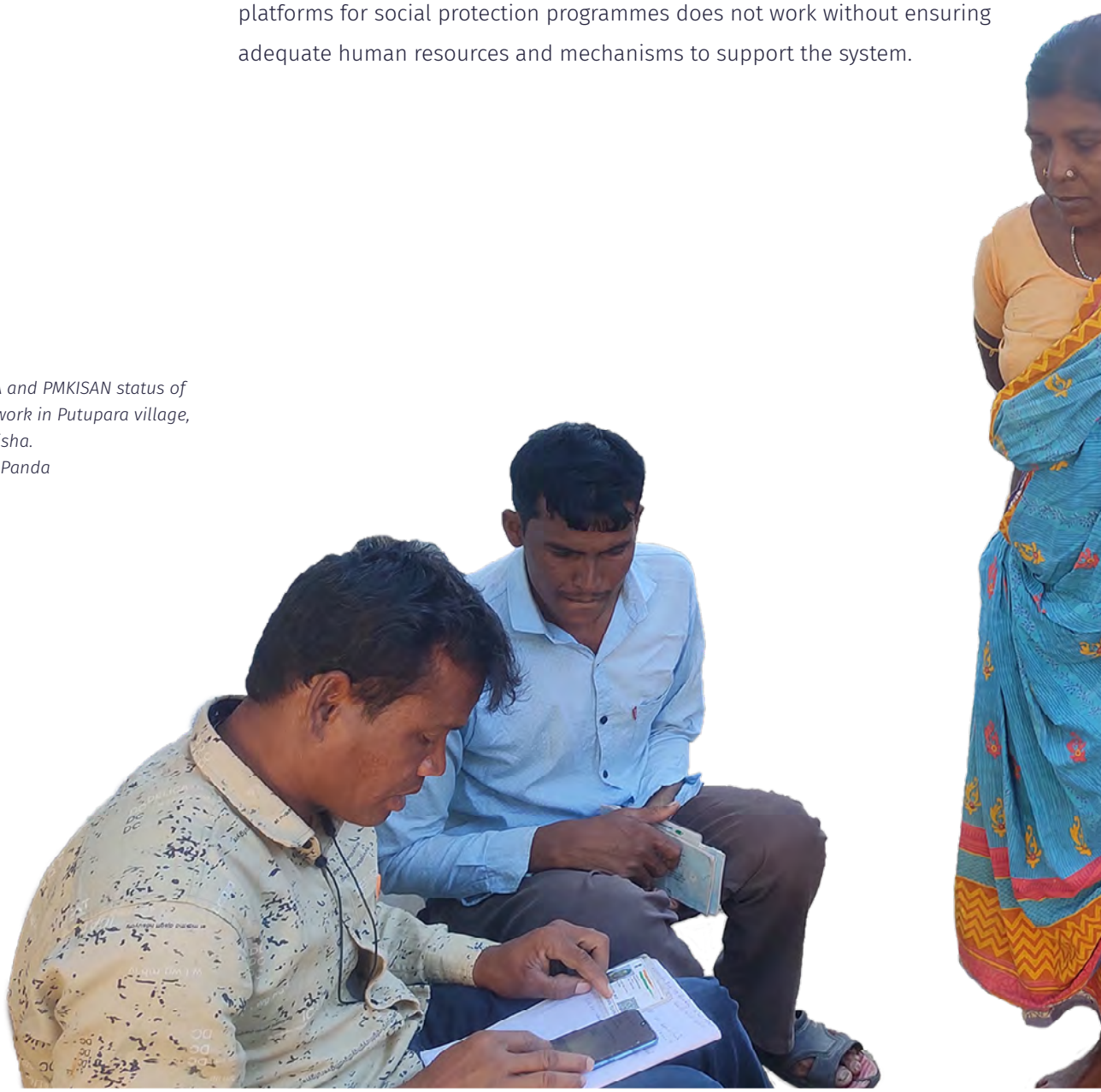
There are also many instances of the information on a portal being in English, which is still alien to the majority of primary beneficiaries – the farmers. This has made farmers completely dependent on local officials or people managing the CSCs for any online process. We found that the majority of the people who had been rejected or whose applications were pending were completely unaware of any updates to their status. The majority of farmers we interacted with had paid money to local ground-level officials and people managing CSCs multiple times, without their grievances getting resolved.

We did not find any evidence of the state actively working towards sensitising people to the process or helping people access the schemes.

5.2 Human rights–based framework and digitised social protection programme

In any social protection programme, it is the role of the state as duty bearer to ensure that eligible people are included, and their grievances redressed. Social protection programmes are designed with rights-based frameworks, with social justice being one of the most important lenses[60].

The role of the state does not end at developing a framework or portal that everyone can theoretically access online; it is equally important to ensure that beneficiaries have access and to empower them to engage with datafied and digitised governance structures. To do so, the state must establish a mechanism which reaches out to farmers in case they face problems with registration of an application or receipt of instalments. The state also needs to make sure that the grievances of farmers are addressed as and when they appear, and deploy necessary technical and human resources for this. We came across multiple cases of farmers, with grievances or pending applications, who had simply given up. Evidently, using technological platforms for social protection programmes does not work without ensuring adequate human resources and mechanisms to support the system.



► *Checking the KALIA and PMKISAN status of farmers during field work in Putupara village, Nuapada District, Odisha.*
Photo Credit: Sameet Panda

5.3 Conclusion

The digitisation of social protection schemes in India, such as the KALIA and PM-KISAN, has the potential to improve the efficiency and reach of these programmes. By leveraging technology, these schemes can more easily target those in need and provide them with the financial support they require. However, it is important to note that the successful implementation of these digitisation efforts depends on various factors, such as the availability of infrastructure, internet connectivity, awareness among citizens, and effective data management.

One major issue is the lack of digital literacy and access to technology among certain segments of the population, particularly those in rural areas. This can hinder such people from utilising these digital services. In addition, there have been technical glitches and system failures which have inconvenienced end users.

A data justice perspective is important to ensure that the digitisation of these schemes is inclusive and does not perpetuate existing inequalities. This means ensuring that marginalised groups have equal access to digital services and that data collection and management are done transparently and ethically. It is also important to ensure that the data collected is used for the intended purpose and that individuals have control over their personal information.

It is crucial to consider the perspectives of end users while digitising social protection schemes and make necessary adjustments to ensure that the benefits of these schemes reach the targeted population. This can be done by conducting regular feedback surveys, involving local communities in the implementation process, and providing training and support to help individuals access and utilise digital services. Further research and monitoring should be done to assess the impact of these digitisation efforts and address any challenges that may arise. Overall, the digitisation of social protection schemes in India can be a powerful tool in the fight against poverty and inequality, if implemented with proper consideration for end-user perspectives and data justice.

5.4 Recommendations

5.4.1 Awareness and communication enabling and empowering the farmers

The KALIA and PM-KISAN are entirely digitised schemes. Everything, from registering to lodging grievances, must be done online on either portal, using a CSC login. However, beneficiaries of the schemes – the farmers in Odisha have low digital literacy. Farmers must be made aware of the schemes in detail – not only how much money they may get or the number of instalments but also the reasons for rejection, how they can check their status if they apply online, if they have to pay a fee, and the time it takes to resolve grievances. This can be done through wall writing at panchayats and PACs and helplines that provide clear information.

The registration and grievance portal of the KALIA scheme is available only in English (KALIA portal), even though English is not the language of communication for most farmers in Odisha. The interactive section of the portal – from completing eKYC and uploading documents to registering grievances – must not be in English only and must have Odia language option. At least in the case of KALIA, all sections should be in Odia as well.

The system of a scheme must be designed keeping in mind access and the situations of end users, who may have low or poor access to and know-how of technology. Therefore, it is essential that along with a digitised portal and system, a robust offline mechanism is put in place for both the state and central schemes. As in AP with Rythu Bharosa and PM-KISAN, field-level functionaries of the agriculture department should be held accountable and ensure that not a single eligible farmer is excluded from the scheme rather than putting the entire onus on the farmers, which is the case in Odisha at present.

Farmers who have registered under the scheme, whether rejected or receiving benefits, have the right to know their status. This should be communicated in a mode they can easily access; for instance, the names and details of the applicants and their status can be made available at the panchayat offices. This information should also be displayed in public places for the farmers' reference. Those who get rejected should be informed, along with the reasons for rejection. Details of the officials they can contact to get their grievances resolved should accompany rejection notifications.

5.4.2 Decentralisation of administrative access

Setting up an online system which is technically not accessible to everyone is not helpful, especially to beneficiaries of the scheme. Officials must be available and accessible to farmers and must have detailed knowledge of

the scheme. Odisha can learn from AP, which has appointed volunteers who are each accountable to an average of 50 households; these volunteers help with everything from registration to lodging grievances for different schemes implemented by the state. Odisha has appointed KSs who with the necessary training, such volunteers can be actively involved in the KALIA and PM-KISAN schemes, and engage in regular communication. They can be the go-to people for the farmers. Many of the complaints, like reasons for rejection of an application, can be dealt with at the local level if farmers are communicated with properly and provided necessary assistance.

From discussions with local-level officials and volunteers, such as VAWs and KSs, involved in the implementation of agricultural schemes, we understood that VAWs have login access to the KALIA scheme but even BAOs do not have this access for PM-KISAN. Decentralised login access facilitates better implementation of the KALIA scheme; however, with limiting the access to district level officials all online registrations for the PM-KISAN scheme are pending in Odisha. From our discussions in AP, we understood that MAOs have online access to the PM-KISAN scheme, which is helping them approve online applications regularly. The number of pending online registrations in AP is quite low. We did not see any reason for the agricultural department to withhold online access to the central scheme from BAOs and VAWs since providing access would lead to the timely approval of online registration and redressal of grievances. The present system has possibly led to the exclusion of thousands, if not lakhs, of farmers in Odisha.

We got the sense from our discussion with agriculture department officials, especially at the block level and below, that the communications with them about registration status and pending grievances are irregular or unsystematic for both schemes, and more so for PM-KISAN. When the state implements such technology-heavy schemes, there must be sound mechanisms in place for regular updates and communications, from the chief district agriculture officer (CDAO) to the KS level.

The block- and lower-level officials reported that they lack the necessary information on PM-KISAN and many a time feel helpless when faced with technicalities. Indeed, there is no system at the state level through which they can communicate directly with the officials involved in the implementation of the scheme. This is leading to a lack of accountability among officials, especially in the central scheme.

There must be a helpline for officials to get necessary clarifications on various aspects of the schemes, especially on the technological front. It would make the process more efficient and faster, and minimise errors.

5.4.3 Developing and designing people-centric technology

The Odisha government claims to have synchronised the KALIA and PM-KISAN databases. However, the technological framework used for this synchronisation does not address the nuances and differences in the guidelines of both the schemes: farmers not having ration cards (not mandatory in KALIA and PM-KISAN), living in urban areas (not mandatory for PM-KISAN), and having landholdings of more than five acres (not mandatory for PM-KISAN). This inflexible design is excluding scores of eligible farmers from both schemes, leading to a loss of INR 12,500 for each 'ineligible' family every year.

Registering grievances on the KALIA portal is only possible for a limited period of the year. We were unable to determine what stops states from keeping it open all year, since technology is not a barrier. Indeed, the portal should always be open and grievances resolved in a timely manner. This would make the grievance redressal framework more dynamic and farmer-friendly.

Looking at the operation of the KALIA and PM-KISAN schemes from the perspective of farmers, it seems that regular audits of the technology and frameworks of the KALIA and PM-KISAN schemes, keeping in mind the farmers' perspectives, are not taking place. It is essential that technological processes are regularly reviewed from an end user's perspective and necessary changes made. The reviews should also be shared in the public domain so that farmers, researchers, and activists can contribute to strengthening the system.

5.4.4 Synchronisation of policy

We learned that land settlements have not taken place for some time and that many land records are in the names of people who passed away long ago. The titles have not been transferred to the successors. Although this has not created problems for beneficiaries of the KALIA scheme it has affected farmers in the case of PM-KISAN, which asks for land records in the names of the farmers. This has led to the exclusion of farmers from the central scheme. It is essential for the Government of Odisha to raise the issue with the Government of India and find a way to address it.

REFERENCES

Astha Banka, Amartya Singh, Arushi Malhotra, Kartik Ramesh, Jai Gijjar, & Anubhav Gupta (2021), " Indian Agriculture since Independence" International Journal of Research in Engineering, science & management, Volume-4, Issue 9 https://journals.resaim.com/ijresm/article/download/1391/1334

"Agriculture Census 2015–16 (Phase-I)", Department of Agriculture, Co-operations and Farmers Welfare, Ministry of Agriculture and Farmer Welfare (2019), https://agcensus.nic.in/document /agcen15 16/T1_ac_2015_16.pdf

"Direct Benefit Transfer (DBT)", PIB, 5 January 2022, https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/jan/doc2022153101.pdf

"Doubling of Farmers Income", Press Information of Bureau, Ministry of Agriculture and Farmers Welfare (2022), https://pib.gov.in/PressReleasePage.aspx?PRID=1883177

"Farmers' Welfare Activities or Package under KALIA Scheme", Department of Agriculture and Farmer's Empowerment, State Government of Odisha, 22 December 2018, https://kalia.odisha.gov.in/assets/guidelines/Notification-23130-KALIA-Notification-Odia-Agri-Dept-22122018.pdf.

"Farmers' Welfare Activities or Package under KALIA Scheme", Department of Agriculture and Farmer's Empowerment, State Government of Odisha, 22 December 2018, https://kalia.odisha.gov.in/assets/guidelines/Notification-23130-KALIA-Notification-Odia-Agri-Dept-22122018.pdf.

"Farmers' Welfare Activities or Package under KALIA Scheme", Department of Agriculture and Farmer's Empowerment, State Government of Odisha, 22 December 2018, https://kalia.odisha.gov.in/assets/guidelines/Notification-23130-KALIA-Notification-Odia-Agri-Dept-22122018.pdf.

"Farmers' welfare activities or Package under KALIA Scheme-KALIA-Notification" Department of Agriculture and Farmer's Empowerment 22 Dec 2018, State Government of Odisha, https://kalia.odisha.gov.in/assets/guidelines/Notification-23130-KALIA-Notification -Odia-Agri-Dept-22122018.pdf

"Frequently Asked Questions", Department of Agriculture and Farmer's Empowerment, State Government of Odisha, no date, https://kalia.odisha.gov.in/FAQ.html .

"KALIA: The Design and Implementation of the Kalia Scheme: A Case study", Government of Odisha (2019).

"Mandatory use of PFMS for Payment, Accounting & Reporting under Direct Benefit Transfer", Department of expenditure plan finance-II, Ministry of Finance, 23rd Dec 2014, https://dbtbharat.gov.in/data/circulars/circular15.pdf

"Operational Guidelines on YSR Rythu Bharosa", Department of Agriculture and Co-operation, Government of Andhra Pradesh, 19 September 2019, https://ysrrythubharosa .ap.gov.in/RBAPP/Downloads/GOMS96.pdf.

"PM-KISAN Frequently Asked Questions", Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare (2020), https://pmkisan.gov.in/Documents/RevisedFAQ.pdf .

"PM-KISAN Frequently Asked Questions", Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare (2020), https://pmkisan.gov.in/Documents/RevisedFAQ.pdf.

"PM-KISAN Scheme Operational Guidelines", Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare, 29 March 2020, https://pmkisan.gov.in/Documents/Revised PM-KISANOperationalGuidelines (English).pdf.

"Situation Assessment of Agricultural Households and Land and Livestock Holding of Household in Rural India 2019", National Statistical Office, Ministry of Statistics and programme Implementation, Government of India, 10 September 2021.

"Standard Operating Procedure for DBT Payments", DBT Bharat, https://dbtbharat.gov.in/data/documents/SOP%20for%20DBT%20Payments.pdf

Sumit kale, Laveesh Bhandari and V. Anantha Nageswaran, " Direct Benefits Transfer: Status and challenges ahead" Indicus Foundation, white paper-July 2021, https://www.indicus.org/admin/pdf_doc/Direct-Benefit-Transfer-Status-and-Challenges-Ahead.pdf

"The Direct Benefit Transfer Report", DBT Mission, Cabinet secretariat in 2016, https://dbtbharat.gov.in/data/documents/REPORT-ON-DBT.pdf

"The Impact of Disaster and Crisis on Agriculture and Food Security", Food and Agriculture Organisation Report (2021), https://www.fao.org/3/cb3673en/cb3673en.pdf.

Aditya Sai Srinivas., et.al “Privacy and security in Aadhaar. In Smart Intelligent Computing and Applications” in (2020): Proceedings of the Third International Conference on Smart Computing and Informatics, Volume 1 (pp. 405-410).Springer Singapore

Andy Clark, “Whatever Next? Predictive Brains, Situated Agents, and The Future of Cognitive Science”, Behavioral and Brain Sciences 36 no. 3 (2013): 181–204, http://doi.org/10.1017/S0140525X12000477

Arushi Gupta and Siraj Hussain, “A Tale of Trade-Offs: The anatomy of the Direct Benefit Transfers System”, The wire, 4th May 2022, https://thewire.in/political-economy /a-tale-of-trade-offs-the-anatomy-of-the-direct-benefit-transfers-system

Barendra Kumar Bhoi and C L Dadhich, “Agrarian Distress in India: Possible Solutions”, Indira Gandhi Institute of Development Research 17 (2019): 1–14, http://www.igidr.ac.in/pdf/publication/WP-2019-017.pdf.

C Sekhar, “Price or Income Support to Farmers: Policy Options and Implications” Economic and Political Weekly 57, no. 12 (2022): 37–44, https://www.epw.in/journal/2022/12/special-articles/price-or-income-support-farmers.html.

Daniel A Sumner, “Agricultural Subsidy Programme” (n.d), https://www.econlib.org/ library/Enc/Agricultural SubsidyPrograms.html

Dipa Sinha and Biraj Patnaik, “Cash for Food: The Need for Caution”, Oxfam India Policy Brief No. 17 (2016),

https://oxfamilibrary.openrepository.com/bitstream/handle/10546/608466/bn-cash-for-food-need-for-caution-010116en.pdf?sequence =1&isAllowed=y.

Direct Benefit Transfer (DBT), Press information Bureau, Ministry of information and broadcasting, 5 January 2022, https://static.pib.gov.in/WriteReadData/specificdoc s/documents/2022/jan/doc2022153101.pdf

Geoffery J Meaden and José Aguilar-Manjarrez, eds., “Advances in Geographic Information Systems and Remote Sensing for Fisheries and Aquaculture”, FAO Fisheries and Aquaculture Technical Paper no. 552, 2013, http://www.fao.org/docrep/017/i3102e/i3102e00.htm.

Jacob Poushter, “Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies” Pew Research Centre, 22 February 2016, https://www.pewresearch.org/global/ 2016/02/22/smartphone-ownership-and-internet-usage-continues-to-climb-in-emerging-economies/ /.

Jana Zscheischler et al., “Perceived Risks and Vulnerabilities of Employing Digitalization and Digital Data in Agriculture–Socially Robust Orientations From a Transdisciplinary Process”, Journal of Cleaner Production 358, (2022): 132034, https://doi.org/10.1016/j.jclepro.2022.132034.

Janmenjoy Nayak, et.al., Socio-economic factor analysis for sustainable and smart precision agriculture: An ensemble learning approach, in 2022, Computer communications, Volume 182, Pages 72-87 https://doi.org/10.1016/j.comcom.2021.11.002

Janmenjoy Nayak, et.al., Socio-economic factor analysis for sustainable and smart precision agriculture: An ensemble learning approach, in 2022, Computer communications, Volume182, Pages 72-87 https://doi.org/10.1016/j.comcom.2021.11.002

Kabir Agrawal, “Almost 75% Farmers Did Not Get All 3 PM Kisan Instalments, A Year After Implementation” The Wire, 28 January 2020, https://thewire.in/economy/pm-kisan-farmers-instalments-modi-government

KALIA-“Frequently Asked Questions”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, no date, https://kalia.odisha.gov.in/FAQ.html.

Kekane Maruti Arjun, “Indian Agriculture: Status, Importance and Role in Indian Economy”, International Journal of Agriculture and Food Science Technology 4, no. 4 (2013): 343–346, https://www.ripublication.com/ijafst_spl/ijafstv4n4spl_11.pdf

Khera, Reetika., “Impact of Aadhaar on welfare programmes” in 2017. Economic and Political Weekly, 52(50), 61-70

Lisa Herzog, Philipp Kellmeyer &Verina Wild., “Digital behavioral technology, vulnerability and justice: towards an integrated approach” in 2022., Review of Social Economy, 80(1), 7-28.

Lisbach., Bertrand., & Meyer., Victoria., “Linguistic identity matching” in 2013., Heidelberg: Springer

Masiero, Silvia, and S. Shakthi. “Grappling with Aadhaar: Biometrics, social identity and the Indian state.” South Asia Multidisciplinary Academic Journal 23 (2020).

Melis U. Guven and Phillippe G. Leite., “Benefits and costs of social pensions in Sub-Saharan Africa” in 2016, openknowledge.worldbank.org

N Shastri, D Sengupta, and P K Garg, “The Changing Landscape of Government Budget and Treasury Operations with IT as Key Driver”, in Citizen Empowerment through Digital Transformation in Government (Chapman and Hall/CRC, 2021), 107–123.

Nikita Ahya et al., “Kalia Scheme: Contours, Prospects and Challenges for Agricultural Productivity”, International Journal of Innovative Technology and Exploring Engineering 8, no. 8 (2019): 1317–1322, https://www.ijitee.org/portfolio-item/h7130068819/.

Nikita Ahya et al., “Kalia Scheme: Contours, Prospects and Challenges for Agricultural Productivity”, International Journal of Innovative Technology and Exploring Engineering 8, no. 8 (2019): 1317–1322, https://www.ijitee.org/portfolio-item/h7130068819/.

Operational Guidelines on YSR Rythu Bharosa”, Department of Agriculture and Co-operation, Government of Andhra Pradesh, 19 September 2019, https://ysrrythubharosa.ap.gov.in/RBAPP/Downloads/GOMS96.pdf

PM-KISAN Scheme Operational Guidelines”, Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare, 29 March 2020, https://pmkisan.gov.in/Documents/RevisedPM-KISANOperationalGuidelines (English).pdf

S K Srivastava, Ramesh Chand, and Jaspal Singh, “Changing Crop Production Cost in India: Input Prices, Substitution and Technological Effects”, Agricultural Economics Research Review 30 (2017): 171–182, http://doi.org/10.5958/0974-0279.2017.00032.5 .

Sameet Panda and Sonalimayee Sahu,“Datafication of the Public Distribution of System in India”, Centre for Internet Society, 2022, https://cis-india.org/raw/datafication -of-the-public-distribution-system-in-india-pdf.

Sandip Sukhtankar, “India’s National Rural Employment Guarantee Scheme: What do we Really Know About the World’s Largest Workfare Program?” India Policy Forum 13, no. 1 (2017): 231–285, https://econpapers.repec.org/scripts/redir.pf?u=https%3A%2F%2Fwww.ncaer.org%2Fpublication%2Findia-policy-forum-2016-17;h=repec:nca:ncaerj:v:13:y:2017:i:2017-1:p:231-28

Sayed Azain Jaffer, et al., “Blockchain Based Direct Benefit Transfer System for Subsidy Delivery”, in 2020 International Conference for Emerging Technology (INCET), (IEEE, 2020), 1–6

Sepulveda Carmona, Magdalena, Carly Nyst, and Heidi Hautala. “The human rights approach to social protection.” Ministry of Foreign Affairs of Finland (2012)

Shailesh Kumar, Shrivastava, et.al., Digital Ecosystem in Social Security Pensions for Direct Benefit Transfer in 2017, Indian Journal of Science and Technology, 10, 23. Center for global development policy paper, 107, 150.

Showkat Ahmad Dar & Dolly Nagrath, “Direct Benefit Transfer: Great Technological move of India” in 2022 International Journal of Information technology and Education (IJITE) 1(3)

Shweta Saini, Siraj Hussain, and Pulkit Khatri, “Farm Loan Waivers in India: Accessing Impact and Looking ahead”, NABARD, 2021, https://www.nabard.org/auth/writereaddata /tender/2304223730farm-loan-waivers-in-india-assessing-impact-and-looking-ahead_compressed.pdf .

Silvia Masiero and Soumyo Das, “Datafying Anti-Poverty Programmes: Implications for Data Justice”, Information, Communication & Society 22, no. 7 (2019): 916–933, https://doi.org/10.1080/1369118X.2019.1575448.

Singh., Prem. “Challenges of E-Governance in Rural areas of Haryana” in 2020. Studies in Indian Place Names, 40(3), 1583-1604.

Vijayanka. Nair, . Becoming data: biometric IDs and the individual in ‘Digital India’, in 2021, Journal of the Royal Anthropological Institute 27(S1), 26-42.

Williamson Ben. “Big data in education: The digital future of learning, policy and practice” in 2017. Big Data in Education, 1-256.

ENDNOTES

1 Astha Banka, Amartya Singh, Arushi Malhotra, Kartik Ramesh, Jai Gijjar, & Anubhav Gupta (2021), " Indian Agriculture since Independence" International Journal of Research in Engineering, science & management, Volume-4, Issue 9 journals.resaim.com .

2 Kekane Maruti Arjun, "Indian Agriculture: Status, Importance and Role in Indian Economy", International Journal of Agriculture and Food Science Technology 4, no. 4 (2013): 343–346, www.ripublication.com .

3 Kabir Agrawal, "Almost 75% Farmers Did Not Get All 3 PM Kisan Instalments, A Year After Implementation" The Wire, 28 January 2020, https://thewire.in/economy/pm-kisan-farmers-instalments-modi-government .

4 Barendra Kumar Bhoi and C L Dadhich, "Agrarian Distress in India: Possible Solutions", Indira Gandhi Institute of Development Research 17 (2019): 1–14, http://www.igidr.ac.in/pdf/publication/WP-2019-017.pdf.

5 "Agriculture Census 2015–16 (Phase-I)", Department of Agriculture, Co-operations and Farmers Welfare, Ministry of Agriculture and Farmer Welfare (2019), https://agcensus.nic.in / document /agcen15 16/T1_ac_2015_16.pdf

6 S K Srivastava, Ramesh Chand, and Jaspal Singh, "Changing Crop Production Cost in India: Input Prices, Substitution and Technological Effects", Agricultural Economics Research Review 30 (2017): 171–182, doi.org .

7 "Situation Assessment of Agricultural Households and Land and Livestock Holding of Household in Rural India 2019", National Statistical Office, Ministry of Statistics and programme Implementation, Government of India, 10 September 2021.

8 C Sekhar, "Price or Income Support to Farmers: Policy Options and Implications" Economic and Political Weekly 57, no. 12 (2022): 37–44, https://www.epw.in/journal/2022/12/special-articles/price-or-income-support-farmers.html.

9 Daniel A Sumner, " Agricultural Subsidy Programme" (n.d), www.econlib.org SubsidyPrograms.html

10 Shweta Saini, Siraj Hussain, and Pulkit Khatri, "Farm Loan Waivers in India: Accessing Impact and Looking ahead", NABARD, 2021, www.nabard.org india-assessing-impact-and-looking-ahead_compressed.pdf .

11 "The Impact of Disaster and Crisis on Agriculture and Food Security", Food and Agriculture Organisation Report (2021), www.fao.org.

12 “Doubling of Farmers Income”, Press Information of Bureau, Ministry of Agriculture and Farmers Welfare (2022), pib.gov

13 “PM-KISAN Frequently Asked Questions”, Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare (2020), pmkisan.gov .

14 “PM-KISAN Scheme Operational Guidelines”, Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare, 29 March 2020, pmkisan.gov PM-KISANOperationalGuidelines (English).pdf

15 “PM-KISAN Frequently Asked Questions”, Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare (2020), pmkisan.gov

16 “Farmers’ Welfare Activities or Package under KALIA Scheme”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, 22 December 2018, kalia.odisha.gov.

17 Nikita Ahya et al., “Kalia Scheme: Contours, Prospects and Challenges for Agricultural Productivity”, International Journal of Innovative Technology and Exploring Engineering 8, no. 8 (2019): 1317–1322, www.ijitee.org

18 KALIA Frequently Asked Questions”, Department of Agriculture & Farmers’ Empowerment, Ministry of Agriculture and Farmer Welfare (2019), kalia.odisha.gov

19 “Operational Guidelines on YSR Rythu Bharosa”, Department of Agriculture and Co-operation, Government of Andhra Pradesh, 19 September 2019, ysrrythubharosa.ap.gov

20 Sayed Azain Jaffer, et al., “Blockchain Based Direct Benefit Transfer System for Subsidy Delivery”, in 2020 International Conference for Emerging Technology (INCET), (IEEE, 2020), 1–6.

21 Showkat Ahmad Dar & Dolly Nagrath, “Direct Benefit Transfer: Great Technological move of India” in 2022 International Journal of Information technology and Education (IJITE) 1(3)

22 “The Direct Benefit Transfer Report”, DBT Mission, Cabinet secretariat in 2016, dbtbharat.gov

23 Arushi Gupta and Siraj Hussain, “A Tale of Trade-Offs: The anatomy of the Direct Benefit Transfers System”, The wire, 4th May 2022, https://thewire.in/political-economy/a-tale-of-trade-offs-the-anatomy-of-the-direct -benefit-transfers-system

24 Sandip Sukhtankar, “India’s National Rural Employment Guarantee Scheme: What do we Really Know About the World’s Largest Workfare Program?” India Policy Forum 13, no. 1 (2017): 231–285, www.ncaer.org

25 “Direct Benefit Transfer (DBT)”, PIB, 5 January 2022, static.pib.gov /specificdocs/documents/2022/jan/doc2022153101.pdf.

26 Direct Benefit Transfer (DBT), Press information Bureau, Ministry of information and broadcasting, 5 January 2022, static.pib.gov

27 Vijayanka. Nair, . Becoming data: biometric IDs and the individual in 'Digital India', in 2021, Journal of the Royal Anthropological Institute 27(S1), 26-42.

28 Shailesh Kumar Shrivastava, et.al., Digital Ecosystem in Social Security Pensions for Direct Benefit Transfer in 2017, Indian Journal of Science and Technology, 10, 23. Center for global development policy paper, 107, 150.

29 Janmenjoy Nayak, et.al., Socio-economic factor analysis for sustainable and smart precision agriculture: An ensemble learning approach, in 2022, Computer communications, Volume 182, Pages 72-87 doi.org .1016/j.comcom.2021.11.002

30 Williamson, Ben. "Big data in education: The digital future of learning, policy and practice" in 2017. Big Data in Education, 1-256.

31 Aditya Sai Srinivas., et.al "Privacy and security in Aadhaar. In Smart Intelligent Computing and Applications" in (2020): Proceedings of the Third International Conference on Smart Computing and Informatics, Volume 1 (pp. 405-410). Springer Singapore.

32 Lisa Herzog, Philipp Kellmeyer &Verina Wild., "Digital behavioral technology, vulnerability and justice: towards an integrated approach" in 2022., Review of Social Economy, 80(1), 7-28.

33 Prem Singh. "Challenges of E-Governance in Rural areas of Haryana" in 2020. Studies in Indian Place Names, 40(3), 1583-1604.

34 Khera, Reetika., " Impact of Aadhaar on welfare programmes" in 2017. Economic and Political Weekly, 52(50), 61-70.

35 Melis U. Guven and Phillippe G. Leite., "Benefits and costs of social pensions in Sub-Saharan Africa" in 2016, openknowledge.worldbank.org

36 Masiero, Silvia, and S. Shakthi. "Grappling with Aadhaar: Biometrics, social identity and the Indian state." South Asia Multidisciplinary Academic Journal 23 (2020).

37 Janmenjoy Nayak, et.al., Socio-economic factor analysis for sustainable and smart precision agriculture: An ensemble learning approach, in 2022, Computer communications, Volume 182, Pages 72-87 doi.org .1016/j.comcom.2021.11.002

38 "Standard Operating Procedure for DBT Payments", DBT Bharat, dbtbharat.gov /SOP%20 for%20DBT%20Payments.pdf

39 "Mandatory use of PFMS for Payment, Accounting & Reporting under Direct Benefit Transfer", Department of expenditure plan finance-II, Ministry of Finance, 23rd Dec 2014, dbtbharat. gov /circular15.pdf

40 N Shastri, D Sengupta, and P K Garg, “The Changing Landscape of Government Budget and Treasury Operations with IT as Key Driver”, in Citizen Empowerment through Digital Transformation in Government (Chapman and Hall/CRC, 2021), 107–123.

41 Silvia Masiero and Soumyo Das, “Datafying Anti-Poverty Programmes: Implications for Data Justice”, Information, Communication & Society 22, no. 7 (2019): 916–933, doi.org

42 Lisbach., Bertrand., & Meyer., Victoria., “Linguistic identity matching” in 2013. Heidelberg: Springer.

43 Andy Clark, “Whatever Next? Predictive Brains, Situated Agents, and The Future Of Cognitive Science”, Behavioral and Brain Sciences 36 no. 3 (2013): 181–204, doi.org

44 Dipa Sinha and Biraj Patnaik, “Cash for Food: The Need for Caution”, Oxfam India Policy Brief No. 17 (2016), oxfamilibrary.openrepository.com caution-010116-en.pdf?sequence=1&isAllowed=y.

45 “KALIA: The Design and Implementation of the Kalia Scheme: A Case Study”, Government of Odisha (2019).

46 Nikita Ahya et al., “Kalia Scheme: Contours, Prospects and Challenges for Agricultural Productivity”, International Journal of Innovative Technology and Exploring Engineering 8, no. 8 (2019): 1317–1322, www.ijitee.org

47 “Frequently Asked Questions”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, no date, kalia.odisha.gov .

48 “Frequently Asked Questions”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, no date, kalia.odisha.gov

49 “Farmers’ welfare activities or Package under KALIA Scheme-KALIA-Notification” Department of Agriculture and Farmer’s Empowerment 22 Dec 2018, State Government of Odisha, kalia.odisha.gov assets/guidelines/Notification-23130-KALIA-Notification-Odia-Agri-Dept-22122018.pdf

50 “Farmers’ Welfare Activities or Package under KALIA Scheme”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, 22 December 2018, kalia.odisha.gov

51 “Frequently Asked Questions”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, no date, kalia.odisha.gov

52 “Farmers’ Welfare Activities or Package under KALIA Scheme”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, 22 December 2018, kalia.odisha.gov.

53 “Frequently Asked Questions”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, no date, kalia.odisha.gov.

54 “PM-KISAN Scheme Operational Guidelines”, Department of Agriculture, Co-operation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare, 29 March 2020, pmkisan.gov PM-KISANOperationalGuidelines (English).pdf.

55 “Frequently Asked Questions”, Department of Agriculture and Farmer’s Empowerment, State Government of Odisha, no date, kalia.odisha.gov

56 “Operational Guidelines on YSR Rythu Bharosa”, Department of Agriculture and Co-operation, Government of Andhra Pradesh, 19 September 2019, https://ysrrythubharosa .ap.gov.in/RBAPP/Downloads/GOMS96.pdf.

57 Jacob Poushter, “Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies

” Pew Research Centre, 22 February 2016, www.pewresearch.org

58 Sameet Panda and Sonalimayee Sahu, “Datafication of the Public Distribution of System in India”, Centre for Internet Society, 2022, cis-india.org.

59 Jana Zscheischler et al., “Perceived Risks and Vulnerabilities of Employing Digitalization and Digital Data in Agriculture–Socially Robust Orientations From a Transdisciplinary Process”, Journal of Cleaner Production 358, (2022): 132034, doi.org.

60 Sepulveda Carmona, Magdalena, Carly Nyst, and Heidi Hautala. “The human rights approach to social protection.” Ministry of Foreign Affairs of Finland (2012).

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www.cis-india.org

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