

Aadhaar and Food Security in Jharkhand

Pain without Gain?

JEAN DRÈZE, NAZAR KHALID, REETIKA KHERA, ANMOL SOMANCHI

Aadhaar-based biometric authentication is now compulsory for most users of the public distribution system in Jharkhand. Based on a recent household survey, this paper examines various issues related to this measure, including exclusion problems, transaction costs, and its impact on corruption. The findings raise serious questions about the appropriateness of this technology for rural Jharkhand.

The public distribution system (PDS) plays an important role in the lives of poor people in Jharkhand. They tend to keep their ration cards safely, go to the ration shop every month without fail, and get angry when the local PDS dealer cheats them. The reason is not difficult to understand: in their fragile and uncertain lives, the PDS provides a modicum of food and economic security.

This is a relatively new development. As recently as 10 years ago, the bulk of PDS foodgrain in Jharkhand was siphoned off by corrupt dealers and sold in the open market. Further, the issue price was not much below the market price, so that, PDS rations had little value even for those who could buy them. It took a series of PDS reforms, recently intensified with the roll-out of the National Food Security Act (NFSA) 2013, to address this situation and put the system on a better footing.

The latest move, however, carries some dangers. We are referring to the imposition of Aadhaar-based biometric authentication (ABBA) on the PDS. This new system was first introduced in Ormanjhi block of Ranchi district a few years ago, and then extended to other parts of Ranchi district, where it is mandatory since August 2016: no authentication, no food. From then on, ABBA was gradually extended to other districts of Jharkhand. By May 2017, the entire state was covered, though some areas (about 15%–20%) were still in “offline” mode.

Soon after that, we conducted a survey in 32 randomly selected villages of Jharkhand to assess the impact of ABBA. This paper presents the main findings of this survey.

The PDS in Jharkhand

The disastrous performance of the PDS in Jharkhand until a few years ago is well-documented. Just to cite one telling statistic, 85% of PDS foodgrain in Jharkhand was estimated to be siphoned off by corrupt middlemen in 2004–05.¹ From the late 2000s onwards, the system improved as the state government initiated a series of PDS reforms inspired by Chhattisgarh’s pioneering initiatives in this field. Without revisiting the reform process, which is discussed elsewhere, we fast-forward to 2016, when the NFSA was in place but ABBA was yet to be introduced.²

Under the NFSA, cardholders fall into two categories: priority and “Antyodaya.”³ Priority households are entitled to 5 kilogram (kg) of foodgrain per person per month at a symbolic price: ₹3/₹2/₹1 for rice/wheat/millets respectively, further reduced (by the state government) to ₹1 per kg in Jharkhand. Antyodaya households, the poorest of the poor, are entitled to 35 kg per month irrespective of family size. In Jharkhand, PDS foodgrain consists mainly of rice. Other food commodities

The web version of this article corrects a few errors that appeared in the print edition.

The authors are grateful to Monika Yadav for helping to coordinate the survey; Anshika Jain for able research assistance; Karthik Muralidharan, Avantika Prabhakar and Mayank Sharma for helpful discussions; Sneha Menon for comments on an earlier draft, and all the volunteers (students and local residents) who took part in the field survey for their spirited cooperation. The authors are also grateful to Vinay Kumar Choubey and Nilambuj Sharan for clarifications related to food policy in Jharkhand and India respectively.

Jean Drèze (jaandaraz@gmail.com) is visiting professor at the Department of Economics, Ranchi University. Nazar Khalid (nazarkhalid6@gmail.com) is research student at the Centre for Economic Studies and Planning, Jawaharlal Nehru University. Reetika Khera (reetika@riseup.net) teaches at the Department of Humanities and Social Sciences, Indian Institute of Technology Delhi. Anmol Somanchi (anmol.somanchi94@gmail.com) was a researcher at IIT Delhi at the time of this study.

(such as sugar and salt) are also distributed from time to time under the PDS, as is kerosene, but the focus of this paper is foodgrain. We also restrict our attention to rural areas.

The mandatory population coverage of the PDS in rural Jharkhand under the NFSA is 86%. Eligible households (priority and Antyodaya) were identified using the Socio-Economic and Caste Census (SECC) of 2011, using the so-called “exclusion approach.” Under this approach, the government notifies a list of simple and transparent exclusion criteria, and then every rural household is eligible by default unless it meets one or more of these criteria. In Jharkhand, the main exclusion criteria are as follows: regular government employment, ownership of a four-wheel vehicle, ownership of more than five acres of irrigated land (or 10 acres of any land), and possession of a *pucca* (concrete) house with more than three rooms.⁴ After an initial list of eligible households was drawn using SECC data, people were given an opportunity to request for corrections or additions. At the time of writing (September 2017), the coverage of the PDS in rural Jharkhand was close to the prescribed norm of 86%.

In 2016, we conducted a series of small-scale surveys of the PDS in various parts of Jharkhand, including Gumla, Khunti and Latehar districts (one block each). Due to small samples and varying methods, it is difficult to generalise from them, but some broad patterns did emerge.

First, the official list of NFSA ration cards has some credibility; we found little evidence of a serious problem of bogus ration cards. This is important, because the alleged problem of bogus ration cards is one of the reasons that have been invoked to argue for linking the PDS to Aadhaar in Jharkhand.⁵

Second, many cardholders complained that the names of some household members (particularly children born after 2011, when the SECC was completed) were missing from the ration cards; a serious issue when entitlements are defined in per capita terms. The proportion of missing names ranged between 10% and 20%, on average, between the sample blocks.

Third, the distribution of PDS rice was fairly regular, although there were occasional instances of a month’s quota being skipped, either due to fraud or disruptions in the supply chain.

Fourth, it was a normal practice for PDS dealers to give people a little less than their entitlements, a practice known locally as *katauti* (cuts). The cuts ranged between 0% and 20%, depending, inter alia, on levels of education and awareness among the cardholders.

Finally, most people were satisfied with the quality of PDS rice. Clearly, the PDS in Jharkhand was doing much better in 2016 than in the old days of rampant embezzlement, yet important issues remained, including the persistence of *katauti*.

How Does ABBA Work?

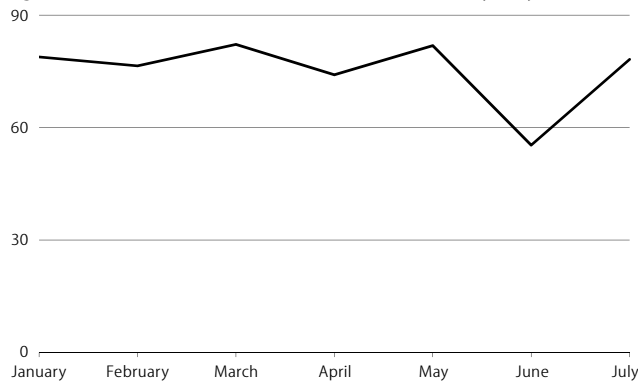
ABBA’s linchpin is the electronic “Point of Sale” (POS) machine, a handheld device installed at every PDS outlet (“ration shop”) and connected to the Internet. The list of ration cards attached to that outlet, and their respective entitlements, are stored in the POS machine and updated every month. When a cardholder turns up, the POS machine first “authenticates” her by matching her fingerprints with the biometric data stored

against her Aadhaar number in the Central Identities Data Repository (CIDR). The machine then generates a receipt with the person’s entitlements, which are also audible from a recorded message (if the machine’s voice-over facility is functional and the dealer activates it, which is not always the case). The transaction details are also supposed to be entered by the dealer in the person’s ration card. Meanwhile, the POS machine generates electronic transaction records that are automatically uploaded on the Jharkhand government’s PDS website (<http://aahar.jharkhand.gov.in/>)—hereafter the “Aahar website.” The Aahar website, incidentally, is relatively well-designed and extremely useful.⁶

All this may sound very good, and would perhaps be very good if the system worked smoothly. In practice, however, there are a number of possible hurdles and glitches. The process of “seeding” Aadhaar numbers into the list of ration cards is far from trivial: it involves not only entering Aadhaar numbers into the ration-card database, but also “verifying” them (to avoid errors or fraud), and dealing with possible inconsistencies between the Aadhaar database and the PDS database (for example, differences in the spelling of people’s names).⁷ The limited battery life of POS machines is a serious problem in areas without electricity connections. Internet connectivity is an even more widespread and recurring hurdle, as large areas of rural Jharkhand are still bereft of it, intermittently or permanently—ABBA is not possible without connectivity. The POS machine itself is sometimes out of order. And of course, even when all these fragile technologies are in good shape, the POS machine may not recognise someone’s fingerprints.

Three useful safeguards are in place. First, *any* household member can collect food rations for the entire family if he or she passes the biometric authentication test.⁸ Second, a fallback “one-time password” (OTP) facility is available in the event where the POS machine does not recognise someone’s fingerprints. Using the OTP facility, however, requires having an active mobile number, correctly seeded into the PDS database. It also requires mobile connectivity for the relevant network at the PDS outlet, which is not a trivial challenge in rural Jharkhand.⁹ Third, a household’s food ration for a particular month does not “lapse” until the end of the following month. For instance, if a household is unable to collect foodgrain from the PDS during the month of May, it is allowed to collect the May ration in June. That, at any rate, is the policy, though people do not always know it as we shall see.

In spite of these safeguards, the system often fails. The most common reason for failure is lack of internet connectivity (temporary or permanent). To deal with this, at least for the time being, the system operates in “offline” mode in some areas. In the offline system, biometric authentication is not required: the POS machine simply generates receipts and records transactions, to be uploaded (by the end of the month) whenever the dealer is able to find connectivity. The offline system, however, does require Aadhaar seeding. Aside from this, the offline system is not very different from the old “register” system (whereby the PDS dealers noted the transactions manually in the sales register), except that the transaction details—as

Figure 1: PDS Transaction Rates in Ranchi District, January–July 2017 (%)

Source: Calculated from official records (<http://aahar.jharkhand.gov.in/>). For further details, see Khalid (forthcoming).

recorded by the dealer on the POS machine—are uploaded to the Aahar website. Both systems, in contrast with the online system, make it relatively easy for a corrupt dealer to record fake transactions, if the cardholders let him or her get away with it. Over time, people have become more vigilant, but vulnerabilities remain.

In May 2017, about 80% of PDS outlets in Jharkhand operated in the online mode, according to data posted on the Aahar website. It is important to note that in the online areas, there is *no exemption* from biometric authentication (other than the limited OTP facility). If the system fails, the concerned cardholders are simply deprived of their food rations. That was, indeed, the predicament of many of the households we met during the survey.

Transaction records are uploaded on the Aahar website, whether the system is online or offline. These records are a rich source of information on PDS transactions in Jharkhand. As discussed further on, however, there may be significant gaps in the digitisation of transaction records under the offline system. Also, between August 2016 and May 2017, the POS system was gradually extended from Ranchi district to other areas, and details of the roll-out schedule do not seem to be in the public domain. The roll-out was supposed to take place block-wise, but it is possible that in practice different areas entered the new system at different times even within a block. For all these reasons, the statewide website records are a little difficult to analyse prior to June 2017. Even in June 2017, some areas were still in the transition phase, even though the POS system was supposed to be in place throughout the state.

In Ranchi district, however, all PDS outlets (with rare exemptions) have operated under the online system since August 2016. This provides a useful opportunity to examine transaction rates, defined as the proportion of cardholders who were able to buy their foodgrain rations from the PDS in a particular month, under the online system. Transaction rates for Ranchi district are presented in Figure 1 (based on Khalid forthcoming), from January to July 2017. The transaction rate was around 80% throughout the reference period, except in June when it was as low as 59%.

In absolute terms, a transaction failure rate of 20% would mean that about 81,000 cardholders are unable to buy their PDS rations in Ranchi district alone (there are 4.07 lakh

cardholders in the district). A similar failure rate in Jharkhand as a whole would imply that 11.2 lakh cardholders and their families are effectively excluded from the PDS. Failure rates may or may not be higher in other districts: Ranchi district tends to have better connectivity and infrastructure than other districts, but the offline option (no longer available in Ranchi) would mitigate this problem.

The Survey

In June 2017, we completed a careful survey of the PDS in 32 randomly selected villages of Jharkhand with the help of student volunteers. Initially, we were hoping to cover all the five divisions of Jharkhand (North Chhotanagpur, South Chhotanagpur, Santhal Pargana, Kolhan and Palamu). For security reasons, however, we had to drop Palamu. In each of the other four divisions, two districts were selected at random, then in each sample district, two blocks, and in each sample block, two villages or more precisely two PDS outlets.

To keep things simple, three types of PDS outlets were discarded from the sample: (i) those serving more than one village; (ii) those with more than 250 ration cards on their list; and (iii) those operating under the so-called “partial online” mode.¹⁰ From now, the term “sample village” will be used to refer to the villages served by the sample PDS outlets; one each.

By June 2017, all blocks of Jharkhand were supposed to be covered under the POS system (online or offline). The last to join were 40 blocks in 10 districts that were held up for the purpose of serving as “control blocks” in a randomised controlled trial (RCT) conducted by the Abdul Latif Jameel Poverty Action Lab (J-PAL). These 40 blocks were supposed to migrate to the POS system in May 2017, but it turned out that some of them were still lingering outside it in June 2017. Four of these laggard blocks were part of our sample. In short, the sample includes three types of villages: (i) online, (ii) offline, and (iii) other, that is, villages that were still under the pre-POS system or in the process of migrating from there to the POS system. In this paper, “online village” and “offline village” refer to villages where the online and offline systems are in place, respectively, and “POS villages” refers to the union of both sets. Among the 32 sample villages, 18 are online and seven are offline. Our main focus is on these 25 POS villages.

For each PDS outlet in the sample, we downloaded the list of ration cards from the Aahar website, and (in the case of POS villages) the transaction records for May 2017—the reference period for the survey. We then divided the cardholders into two groups—“transacting” and “non-transacting” households—depending on whether they had bought grain (rice or wheat; mostly rice) from the PDS in May 2017, according to the transaction records. Our aim was to interview 20 randomly selected transacting households and 20 randomly selected non-transacting households in each sample village. Some villages, mainly in the offline areas, had fewer than 20 households in the non-transacting group. In such cases, the survey teams were instructed to interview all the non-transacting households. The data set used in this paper consists of 890 sample households, with close to 5,000 members.¹¹

As discussed below, recorded transactions (as displayed on the Aahar website) are not always the same as “reported transactions” (RT) (based on the household survey). To distinguish between the two, we shall refer to them as “digitised transactions” (DT) and RT respectively. From now on, the term “transacting household” refers to RT, not recorded transactions, unless stated otherwise.

In addition to interviewing the sample households, the survey teams also visited all the sample ration shops and conducted a detailed interview with the PDS dealers. The dealers were mainly of two types. Some were traditional private dealers, generally well-off and often upper caste (though some of the dealers were Adivasis, mainly in villages with a large Adivasi population). In other cases, the PDS outlet was managed by a women’s self-help group (SHG): sometimes an active SHG, or a symbolic SHG actually run by a private dealer or some other individual. For SHG-managed outlets, the survey team generally interviewed an active member of the SHG who was involved in running the outlet.

Main Findings

A reasonably clear picture of the functionality of the PDS in Jharkhand, before and after the POS system was introduced, emerged from the survey. The situation in the sample villages seems to be similar to what we had found in the small-scale surveys mentioned earlier.

Functionality of the PDS: By and large, cardholders receive their food rations every month at the correct price (₹1 per kg), and the rice is normally of fair quality. Undoubtedly, the PDS in Jharkhand has improved a great deal in recent years. A number of issues, however, remain.¹²

First, many respondents complained that the names of some household members (especially young children) were missing from their ration card. This meant losing out on food rations, since PDS entitlements are defined in per capita terms for priority households. The average number of missing names was close to one per ration card, as was found in the earlier surveys. Clearly, very little had been done in the intervening period to add the missing names.¹³

Second, katauti has declined over the years, but is still rampant. For the first time, we found a few villages where most or even all respondents (more precisely, transacting households) reported that they were receiving their full rations without cuts. Katauti, however, remains the norm; up to 20% (one kg out of five) in the more remote and deprived areas, such as the sample villages of Sahibganj district. As discussed below, katauti has remained much the same before and after the POS system was introduced.

Third, in addition to being short-changed on the quantity, cardholders are sometimes overcharged. For instance, they get 32 kg of rice instead of 35 kg, and on top of that, they pay ₹35 instead of ₹32. Sometimes people are charged more than ₹1 per kg of rice. However, this is a less serious form of corruption since the baseline charges are very low. And most of the respondents did pay the correct price.

Fourth, many investigators felt that the selection of Antyodaya households (poorest of the poor) was far from satisfactory. The selection criteria and identification process are not clear in the first place. Unfortunately, it is difficult to scrutinise this issue with the available survey data.

Last but not least, a series of “new” issues have emerged, related to the POS system in general and ABBA in particular. These are discussed further on.

A useful indicator of the functionality of the PDS is what we have called the “purchase–entitlement ratio” (PER) in earlier writings (for example, Khera 2011b). This refers to what people get from the PDS as a proportion of their entitlements.¹⁴ For instance, if an Antyodaya household (entitled to 35 kg of foodgrain per month) actually gets, say, 32 kg per month, then the PER would be 91%. To put it another way, the PER is the counterpart of katauti (9% in this example). Since foodgrain allocations go down the line (district, block, village, etc) based on the quantities people are entitled to as per their ration cards, the PER is a very useful indicator of the cumulative “leakages” in the system. If there is any leakage at any point down the line, it is bound to be reflected in a lower average PER in the concerned area.¹⁵

As discussed subsequently, the average PER for transacting households was much the same in online and offline villages: around 93%–94%. In other words, PDS users in Jharkhand now seem to get the bulk of their entitlements, if they transact at all. In the online areas, however, there is a major problem of transaction failures.

Transacting and non-transacting households: Among sample households in the online villages, the proportion of non-transacting households was 37% according to the website records and 36% according to the survey data (Table 1a). Further, most of those who had transacted according to the website had transacted according to the survey and vice versa, though there were occasional discrepancies.¹⁶ This suggests that transaction records for online areas are reasonably reliable, at least in terms of transaction counts (quantity records are less reliable, as we shall see). As Table 1b indicates, this is not the case in offline areas: about two-thirds of the sample households that had not transacted in May 2017 according to the website reported that they had, in fact, bought their food rations in that month. In other words, gaps in the digital records seem to be quite common in the offline areas.

Table 1a: Percentage Distribution of Sample Households by Transaction Status—Online Villages

Web-based Transaction Data	Survey-based Transaction Data		
	Transacting	Non-transacting	All Households
Transacting	54.1	9.1	63.2
Non-transacting	9.6	27.1	36.8
All households	63.8	36.2	100

Source: Website records (<http://aahar.jharkhand.gov.in/>) and field survey. Transacting households are defined as households that bought foodgrain from the PDS in May 2017 (see text).

Table 1b: Percentage Distribution of Sample Households by Transaction Status—Offline Villages

Web-based Transaction Data	Survey-based Transaction Data		
	Transacting	Non-transacting	All Households
Transacting	64.2	4.3	68.5
Non-transacting	21.9	9.6	31.6
All households	86.1	13.9	100

Source: Website records (<http://aahar.jharkhand.gov.in/>) and field survey.

The proportion of non-transacting households within the sample does not tell us anything about the overall rate of transaction failures in the sample villages, since the survey teams had pre-specified targets for the numbers of transacting and non-transacting households in each village.¹⁷ However, transaction failures can be estimated from website records for *all* cardholders in the sample villages. Based on DTS, the proportion of non-transacting households is 21% in online villages and 12% in offline villages.¹⁸ Assuming, by extrapolation from the survey data that only one-third or so of the non-transacting households in offline villages (according to DTS) had actually failed to transact in May 2017, the true proportion of non-transacting households in these villages would be around 4%. This would imply that transaction failures were five times as high in online villages as in offline villages.

Table 2 compares transacting and non-transacting households in the online villages. There are no major differences between the two groups, but transacting households tend to be larger on average, and single-member households are over-represented among non-transacting households. This is not difficult to understand: the larger the household, the higher the chance of successful authentication, since more individuals are available to try their luck with the POS machine (remember that any household member is entitled to collect rations for the entire household). Single-member households are particularly vulnerable to authentication failures. Aside from this, there is a tentative indication that owning a mobile helps to avoid transaction failures, presumably because of the OTP facility, though few people were actually using it among the sample households.

Double transactions, a digression: Before we proceed, we should discuss a minor complication in the argument so far, which relates to what might be called “double transactions.” As mentioned earlier, when households are unable to buy their food rations in a particular month, the POS system allows them, in principle, to buy double rations the next month. It is, thus, possible that transaction failures are compensated, partly at least, by double transactions. Even so, of course, transaction failures would

Table 2: Comparison of Transacting and Non-transacting Households in Online Villages

	Transacting	Non-transacting
Average household size	6.0	5.4
Proportion of single-member households ^a (%)	1.7 (2.3)	3.9 (5.1)
Proportion that have a mobile (%)	87	77
Level of education of most educated member ^b		
None	7	9
Some, but below Class 10	39	34
Class 10 or more	54	56
Category ^b		
SC	10	5
ST	29	39
Other	61	56
Religion ^b		
Hindu	56	53
Muslim	22	15
Other	22	33

^aIn brackets, proportion of households with a single member listed on the ration card.

^bPercentage distribution; totals may not add to 100% due to rounding.

Source: Field survey.

be a serious nuisance. More importantly, it seems that the “two-month window” facility is, in fact, poorly used and even misused.

In the online villages, nearly half of the sample households were not even aware of this facility. Only 6% of transacting households (in all POS villages) reported buying double quantities in May 2017. Interestingly, the digital records suggest a higher figure (16%), but in most cases of double transaction, according to digital records, the concerned household reported a single transaction in the survey. Digital records, it seems, exaggerate the actual incidence of double transactions. This is not surprising. Indeed, when a cardholder is not clear about the two-month window facility, it is quite easy for a dealer to record a double transaction in the POS machine in the second month (if the cardholder failed to transact the previous month) while giving him or her a single month’s ration.

We take this opportunity to mention that this is not the only way PDS dealers have found to “rig” the digital records from time to time, even in the online system. Some of them, as we shall see, do this by “separating” authentication and distribution and playing hide-and-seek at the distribution stage. Others take advantage of illiterate or gullible cardholders by telling them that authentication has failed, when it has actually succeeded, then enter a fake transaction in the POS machine. And of course, *katauti* is rarely recorded.

Exclusion problems: Tables 3 and 4 (p 55) present some basic information on the PDS experience of transacting and non-transacting households in POS villages. As Table 3 brings out, the fact that many households do not buy their food rations cannot be attributed to any lack of interest on their part (a common “explanation” among government officials). Our earlier observation that the PDS means a lot to most people in rural Jharkhand is reflected in the survey responses: hardly any non-transacting households said that they were not interested in PDS grain. In most cases, a transaction failure means that the household was unable to buy food rations for no fault of its own, which is often because of ABBA-related issues. Table 3 also brings out that, among households that failed to transact in May, only one out of four had been able to make up for it in June, by the time of the survey (in late June). Barely half of them knew that it is possible to do so.

The main problem with ABBA is that some households are unable to pass the biometric authentication test and lose out on their food rations: month after month in some cases, once in a while in others. In the survey questionnaires, we defined a “POS-able” household member as someone who is normally able to use the POS machine in online mode (without having to use the OTP facility). This requires having an Aadhaar number, correctly seeded into the system, and being able to pass the biometric authentication test. In the online areas, we tried to find out how many persons in each household were POS-able.

A significant minority of sample households—about 7%—had no POS-able member at all. These were the worst victims of the ABBA system. They were mainly small households, like elderly couples and widows living alone, with fingerprint recognition problems. Often, they were among the poorest households in

the village, and the loss of food rations was a tragedy for them.¹⁹

Another form of exclusion is periodic inability to buy PDS rations because the PoS-able members of the household are not available (for instance, they were away from the village), or temporarily unable to transact due to fingerprint recognition or connectivity problems. About 20% of non-transacting households reported that no PoS-able member was available to go to the ration shop at the time of distribution (Table 3). Unlike Chhattisgarh, Jharkhand does not have a fixed distribution schedule (whereby distribution takes place on pre-specified days of the month), and indeed, planned distribution is difficult under the ABBA system. This is partly because distribution takes many days, and partly because it depends on connectivity. As a result, PoS-able members who live outside the village often find it difficult to guess when distribution is likely to happen.

Sporadic internet connectivity is another major hurdle. Sometimes, light rain is enough to disrupt connectivity or the electricity supply. Every step in the ABBA process—ration card verification, biometric authentication, electronic upload of transactions, updating NFSA lists and entitlements on the PoS machine—depends on internet connectivity. Further, even with stable connectivity, biometric authentication is not always easy. Biometric failures are especially common for two groups: the elderly, and manual labourers. Both are particularly vulnerable to food insecurity.

Almost half of the non-transacting households in online villages explicitly mentioned PoS-related problems as the main reason for their inability to buy their food rations in May (Table 3). There are, of course, other reasons too, such as the tendency of some dealers to play hide-and-seek with their customers (for example, by telling them to “come later”) in the hope that some of them will fail to collect their rations.²⁰ Even that, however, is easier to do when connectivity failures give them a good excuse not to distribute. The fact that transaction failures are much higher in online than offline areas confirms that ABBA bears a major responsibility for these failures. It is also worth noting, from Table 4, that half of the transacting

Table 3: Respondents' Experience of the PDS—Non-transacting Households

	Online Villages	Offline Villages	All PoS Villages ^a
Percentage distribution of respondents by reason for non-transaction in May 2017:			
Not interested in PDS grain	0.5	0	0.4 (0)
No household member is “PoS-able”	13	12	13 (0)
No PoS-able member was available to go to the ration shop at the right time	20	19	20 (0)
PoS system did not work	9	0	8 (2)
Went to the ration shop, but dealer refused	30	15	29 (6)
Other reasons	27	54	30 (92)
Proportion (%) of respondents who know that they can still collect their May ration in June, if need be	55	84	59 (63)
Proportion (%) of respondents who:			
Actually collected their May ration in June	26	71	31 (57)
Expected to be able to collect their May ration later in June ^b	14	17	14 (46)
Average number of months that have lapsed since respondent was able to buy PDS rations	2.1	2.1	2.1 (0.4)

^aIn brackets, figures for “other” villages, ^bThe survey began on 19 June and ended on 30 June. Source: Field survey.

households experienced at least one PoS-related problem (for example, difficulty with biometric authentication) in May 2017 (more about this in subsequent sections in the article).

Experience of users: Transacting households' experience of ABBA and the PoS system varies a great deal. Some, including relatively large households in villages with good connectivity, are able to use the system without difficulty. When there are many household members, at least some are likely to be PoS-able. If internet connectivity is also good, then biometric authentication may not be difficult. In these circumstances, many people appreciated the PoS system, mainly because they felt (without necessarily being clear about the how and why) that the machine provided some protection against fraud.

Many others, however, experienced difficulties of various sorts, even if they were ultimately able to transact. When internet connectivity comes and goes, people have to queue for a long time, or make repeated trips to the ration shop, or follow the PDS dealer as he or she moves around looking for a spot where there is “tower” as it is called in Jharkhand. The uncertainties of foodgrain distribution also create anxiety for poor people and detract from the PDS's purpose of bringing some security in their lives.

Here again, small households, with few PoS-able members if any, are among the worst affected (among the sample households, about 10% have only one or two members). Another vulnerable category is that of households where the PoS-able members normally live outside the village. Some of these non-resident PoS-able members have to make repeated visits to the village to try their luck at the ration shop, without knowing in advance whether the system is working on that particular day. Under the old register system, they were able to rely on some other household member (or even a neighbour or relative if need be) to go to the ration shop.

As expected, there are significant differences in transaction costs between online and offline villages (Table 4). In the online villages, about half of the transacting households reported problems with the PoS system, compared with only 10% in the

Table 4: Respondents' Experience of the PDS—Transacting Households

	Online Villages	Offline Villages	All PoS Villages ^a
Purchase-entitlement ratio, May 2017 ^b	93	94	94 (93)
Average price paid, May 2017 (₹/kg)	1.1	1.0	1.0 (1.0)
Average number of monthly rations received in the preceding six months	5.7	5.7	5.7 (5.6)
Average number of trips to the PDS outlet, May 2017	1.5	1.1	1.3 (1.1)
Average time spent on collecting PDS ration, May 2017 (minutes)	101	79 ^b	94 (57)
Proportion (%) of respondents who report using the online PoS machine for PDS purchase in May 2017	99	n/a	n/a
Proportion (%) of respondents who experienced at least one PoS-related problem in May 2017 ^c	51	11	38 (n/a)
Proportion of respondents who used the OTP facility in May 2017 (%)	3	0	2 (n/a)
Proportion of respondents who got a printed receipt in May 2017 (%)	21	3	15 (n/a)

n/a: not applicable, ^aIn brackets, figures for “other” villages, ^bFor details, see Table 5, ^c“PoS-related problem” (not including OTP-related problems): Aadhaar number(s) not seeded; connectivity problem; broken machine; biometric failure; error message. Source: Field survey.

offline villages. Similarly, most transacting households in the offline villages did not have to make more than one trip to the ration shop in May 2017, but in online villages, the average number of trips to the ration shop in May 2017 was 1.5. Further, the OTP facility was yet to be activated in many online villages: only 3% of the transacting households had used it in May.²¹

As for printed receipts, it was a general practice for dealers to avoid giving them to the cardholders. One possible reason is that the dealers use the receipts to keep track of the transactions (registers are not maintained anymore and digital records are not always readily accessible to the dealers). Another is that it is embarrassing for dealers to give receipts for the full amount after they take a cut from the rations: it draws attention to the fact that katauti is an act of corruption, and not a way of covering transaction costs as the dealers often tell their customers.

Quantity fraud persists: Aside from enquiring about PDS purchases in May 2017, we also asked the respondents how much grain they used to get from the PDS before the POS system was introduced. This makes it possible to compare PERS (or their counterparts, the katauti levels) before and after ABBA. The PER estimates are presented in Table 5.²²

The good news, from Tables 4 and 5, is that most transacting households in both online and offline villages get the bulk of their entitlements at the correct price. Further, most of those who were able to buy their PDS rations in May 2017 also received them every month in the preceding six months (Table 4, third row).

The bad news is that PERS were the same before and after the POS system was initiated. They are also quite similar between online and offline villages (93% and 94% respectively). This is not very surprising, since ABBA is no protection against katauti. In principle, the POS machine can help, mainly because the voice messages tell people about their entitlements. But most people do not know their entitlements, at least when it comes to rice.²³ The main problem is not lack of knowledge, but lack of power to resist being cheated by the dealer. The POS machine is of little help in that respect, except in areas (there are some) where people are so disempowered that they are not even aware of their rice entitlements.

Katauti levels do vary between different areas. Generally, they are higher in areas where people are poorer, less educated, more isolated and less aware of their entitlements (for example, due to the absence of active non-governmental organisations or other organisations in the area). The sample villages of Sahibganj, one of Jharkhand's poorest districts (tucked away at the

Table 5: Purchase–Entitlement Ratio before and after the PoS System (%)

	Online Villages	Offline Villages	All PoS Villages
Before the PoS system	93	94	94
May 2017	93	94	94
No of observations ^a	259	137	396

^a Figures are based on transacting households, excluding those with missing data for either period as well as cases of “double transaction” (see note 22).

Source: Field survey.

Table 6: Average Distribution Time before and after the PoS System (days)

	Online Villages	Offline Villages	All PoS Villages
Before the PoS system	4	3	3.7
Nowadays	13	4	10.3

Source: Field survey (responses of PDS dealers).

tip of Santhal Pargana), were of that sort. Katauti levels there were often as high as 20%–1 kg per person per month.

Katauti levels are usually the same for everyone at a given PDS outlet. Presumably, any discrimination between cardholders would be fiercely resented and resisted. In a few sample villages, however, we found some instances of social discrimination at the ration shop. For instance, in Sangrampur (also located in Sahibganj), Dalit cardholders complained that they were receiving less than others and sometimes did not even receive anything in a particular month. None of this seemed to have changed with the introduction of the POS system.

ABBA and corruption: Corruption in the PDS is mainly of three types: identity fraud, eligibility fraud and quantity fraud (on this see Khera [2017] in this issue). Identity fraud happens when a ration card is issued in the name of a person who does not exist (bogus card) or who already has a ration card (duplicates). Eligibility fraud means that a ration card is issued to someone who is not eligible. Quantity fraud occurs when a cardholder receives less than his or her due. Katauti is the main source of quantity fraud in Jharkhand.

The survey findings suggest that katauti levels have remained much the same after ABBA was introduced. We found little evidence of identity fraud (a type of corruption that ABBA can help to plug), whether in June 2017 or during other post-NFSA surveys. Eligibility fraud may be an issue in Jharkhand, but ABBA does not help to prevent it.²⁴

In some ways, ABBA has actually made the PDS more vulnerable to corruption in Jharkhand. One of them relates to the increase in transaction costs for PDS dealers. Before ABBA, foodgrain distribution used to take just a few days every month. Today, it takes much longer, because of the hassles of biometric authentication. It takes 13 days on average in the online villages, and even longer in villages with poor connectivity, compared with just four days prior to the POS system (Table 6). Dealers' commissions, however, have remained the same (₹1 per kg at the time of the survey). When dealers spend more time distributing, they naturally want to earn more. If commissions remain the same, they may be tempted to look for new ways of milking the system. ABBA makes that difficult, but there are ways. For instance, in some sample villages we found that the dealers had “separated” biometric authentication from foodgrain distribution: they first perform serial biometric authentication for a particular group of households, wherever they find connectivity, and then distribute to these households the next day. The ostensible reason is to reduce transaction costs, but this also provides an opening to cheat some of the more vulnerable cardholders, for instance by telling them the next day that food has run out, or that the machine rejected their fingerprints.

There is another, possibly more important, reason why PDS corruption in Jharkhand may have increased rather than decreased after ABBA was imposed. Whenever people are unable to buy their food rations, due to biometric failure or other glitches, the dealer is left with a surplus at the end of the month. This closing balance, ideally, should be adjusted against the next month's allocation, so that no food gets siphoned off.

In Jharkhand, however, these adjustments are not being made, or rather, they were yet to be initiated at the time of the survey (nearly one year after ABBA was made compulsory in Ranchi district). In other words, dealers were getting their full allocation month after month, irrespective of how much they actually distributed.²⁵ The closing balance was almost certainly siphoned off every month, though we have no direct evidence of it.

When we discussed this issue with the food secretary in Jharkhand, he said that since the government had all the necessary transaction records, the requisite adjustments would be made “very soon,” with retrospective effect (an attempt to do that had apparently been made earlier, but the dealers had resisted it). And indeed, in August 2017, the government started deducting the accumulated closing balances from dealers’ allocations. The accumulated balances, however, were so large that some dealers were expected to distribute an entire month’s rations, or even more, from their existing stocks. These “stocks,” however, were just digital records, and their physical counterparts had often been sold off by PDS dealers. Recent reports from the sample villages and elsewhere suggest that many dealers are coping with this by telling people (truthfully as it happens) that they have nothing to distribute. What is not clear is how the system is supposed to get back on track: if dealers do not distribute, their cumulative closing balance will remain the same, unless they rig the digital records.

In short, far from helping to eliminate corruption, ABBA seems to have led to a revival of PDS corruption in Jharkhand, at least for now.

Perceptions of users and dealers: The survey included a few questions about how the respondents felt about the PoS system, or the “machine” as people tend to know it. In particular, we asked people which system they preferred for themselves, and which system they considered better for the village as a whole. The investigators were trained to ask these questions in a sort of discussion mode, and to record the answers after some gentle probing and enquiring.

The responses varied a great deal. Some people had strong views one way or another, often influenced by their personal experience of the system. For instance, those who had been deprived of food rations in the recent past due to biometric failures or other ABBA-related problems often stated without ambiguity that they wanted the machine to be removed. Among those for whom the system worked well, some had become strong advocates of it, others remarked that while it worked well for them it did create problems for others. Sometimes, the PoS advocates had good arguments, sometimes they just seemed to have an idle fascination with the machine. One of them enthusiastically exclaimed, “this is digital India!” Many respondents could easily be swayed one way or another.

Nevertheless, some patterns emerged from the responses, these are summarised in Table 7. In the online villages, a large majority of respondents felt that the PoS system had made things more difficult for them, and two-thirds (among those who had a view) wanted it to be discontinued. As one might expect, the corresponding proportion was even larger among

non-transacting households (77%). In the offline villages, about half of the respondents felt that the PoS system had made things more difficult for them, for reasons that are not entirely clear.²⁶ There too, a majority of households wanted the machine removed, perhaps because they knew that it would go online sooner or later and anticipated problems with biometric authentication. Interestingly, across the PoS villages there is a positive and significant correlation between the number of months that have lapsed since the PoS system was installed and the proportion of respondents who oppose it: the longer people’s experience with ABBA, the less supportive they are of it.

Finally, Table 8 presents some information on the perceptions and views of PDS dealers (there were only 25 in the PoS villages, unfortunately). In the offline areas, dealers seem to feel that the PoS system makes little difference to the cardholders, but makes their own job more difficult, this is quite plausible. Nevertheless, four out of seven in the offline areas felt that the offline PoS system was the most appropriate system for their village.

In the online areas, a majority of dealers (among those who had a view) felt that the PoS system had made things more difficult for them, and a large majority felt that the system had made things more difficult for the cardholders. Only four out of 18 were in favour of a continuation of the online PoS system. About half advocated a return to the old register system. It might be argued that dealers have a negative view of the online PoS system because it makes it harder for them to cheat.

Table 7: Perceptions of the PoS System—Households

	Online Villages		Offline Villages	
	Transacting	Non-transacting	Transacting	Non-transacting
Proportion (%) of respondents who feel that the PoS system has made PDS purchase: ^a				
Easier	25	n/a	24	n/a
More difficult	61	n/a	48	n/a
No change	14	n/a	29	n/a
Proportion (%) of respondents who feel that the PoS system should be: ^b				
Continued	36	23	30	40
Discontinued	64	77	70	60

^a Among those who had a view. This question was omitted for non-transacting households.

^b Among those who had a view. About 12% of respondents in online villages and 26% in offline villages had no strong view.

Source: Field survey.

Table 8: Perceptions of the PoS System—PDS Dealers

	Online Villages	Offline Villages	All PoS Villages
Number of PDS dealers who feel that the PoS system has made their job: ^a			
Easier	6	2	8
More difficult	9	4	13
No change	1	1	2
Number of PDS dealers who feel that the PoS system has made things: ^a			
Better for people	4	1	5
Worse for people	11	1	12
No change	1	4	5
Number of dealers who feel that the most appropriate system for their village is: ^a			
PoS online	4	0	4
PoS offline	3	4	7
Partial online	1	0	1
Register system	9	3	12
Number of villages/dealers	18	7	25

^a Based on responses of dealers who had a view.

Source: Field survey.

As discussed earlier, however, quantity fraud continues much as before and it is possible that the online POS system has even generated new forms of corruption, for the time being at least.

Official response: Early findings of this survey have been shared with various government officials (mainly in the food department) of the state and central governments. Most of them acknowledge the problems that have emerged, but the responses vary a great deal. Some officials, particularly those who see the system mainly through computer terminals in air-conditioned rooms, downplay them as mere “teething problems” or argue that the answer is more technology, for example, iris scanners. Others are more concerned, and even accept that ABBA entails a denial of legal entitlements for many. One point, however, is widely taken as: ABBA is going to continue because the central government, and more specifically, the Prime Minister’s Office, insists on it. As one food department official in Delhi (himself relatively open-minded) put it, biometric authentication is “the government’s policy,” full stop. This lack of willingness to reconsider ABBA in the light of evidence is worrying.

Concluding Remarks

The imposition of ABBA on the PDS in Jharkhand seems to be a case of “pain without gain.” On the one hand, the system has led to serious exclusion problems (particularly for vulnerable groups such as widows, the elderly and manual workers) as well as higher transaction costs. On the other, it has failed to reduce quantity fraud, which is the main form of PDS corruption in Jharkhand. Nor has it helped to address other critical shortcomings of the PDS in Jharkhand, such as the problem of missing names in ration cards, the identification of Antyodaya households, or the arbitrary power of private dealers.

The POS system does have some helpful features. In particular, it has led to more timely and reliable recording of PDS transactions. The earlier “register” system was very defective in that respect. Having said this, digitisation of PDS transactions does not require ABBA. It can be achieved, for instance, using a simpler and well-tested technology such as smart cards, without the problems associated with ABBA’s dependence on biometrics and the Internet. Compared with smart cards, ABBA supposedly has the advantage that fingerprints, unlike a smart card, cannot be appropriated by someone else (at least not without the sort of technical knowledge required to fake fingerprints). But it is very unlikely that many people would part with their PDS smart card if they had one, judging from how possessive they are today with their ration cards. Further, the fact that ABBA prevents anyone from collecting rations in someone else’s name is not necessarily a good thing. For old people, being able to let a neighbour or relative go to the ration shop on their behalf is an important facility. In that respect, smart cards would be better than ABBA. Several states (including Chhattisgarh, Puducherry and West Bengal) have recently experimented with smart cards and related technologies in the PDS, and some of them may show a possible way forward.

Meanwhile, at the very least, a reliable alternative to ABBA must be put in place for excluded households. Imposing a technology that does not work on people who depend on it for their survival is a grave injustice.

Postscript

The PDS in Jharkhand has been a subject of much discussion in recent weeks, following incidents of starvation among households that had been excluded from the system.²⁷ Two important issues have come to light.

The first issue is the mass cancellation of ration cards not linked to Aadhaar, based on an order issued by the chief secretary of Jharkhand on 27 March 2017. As mentioned earlier, seeding a ration card with Aadhaar is not a simple matter. The cancellation drive excluded from the PDS many poor people who were unable to link their ration card with Aadhaar in good time, for no fault of their own. While the Government of Jharkhand claims that most of the cancelled ration cards were fake, it has failed to provide any evidence of this, or to release any information that might help to verify the cancelled cards. Preliminary verification exercises in three blocks (Khunti, Mahuadanr and Manika), conducted by some of us in collaboration with local *sahayata kendras* (help centres), suggest that most of the concerned cardholders are, in fact, alive and eligible.

The other issue is the adjustment of cumulative closing balances, briefly discussed in the text. As we saw, it is not clear how dealers were supposed to get back on track, in cases where they had already disposed of their accumulated stocks. There is growing evidence that many of them did it by rigging the digital records. In Beltoli village of Latehar district, we discovered one of the methods that are being used for this purpose. The dealer there is telling people that the foodgrain entitlements of priority households—5 kg per person per month—are now restricted to the names (not just the cards) that have been seeded with Aadhaar. Judging from 25 testimonies collected in Beltoli on 1 November 2017, this enables the dealer to distribute just 60% of the prescribed quantity while entering the full amount in the POS machine. Further enquiries in neighbouring villages suggest that this practice is not confined to Beltoli.

We heard of other methods too, including one whereby dealers simply tell people that it is “Modi’s wish” that they should undergo biometric authentication at least once without getting any rice. This enables them to record fake transactions with abandon. All this illustrates a more general point: in Jharkhand, ABBA has not reduced the power of PDS dealers, which is the real root of corruption. On the contrary, it has increased people’s dependence on the local dealer, because it is the dealer who knows the rules of Aadhaar seeding and biometric authentication.

In response to the public outcry that followed recent starvation deaths in Jharkhand, the central government recently issued an order (on 24 October 2017) directing state governments to ensure that those for whom ABBA does not work are able to buy their PDS rations using an “exemption register.” This may be a step in the right direction, but it is unlikely to go far enough.

NOTES

- 1 This estimate is based on matching official data on foodgrain offtake from the Food Corporation of India (FCI) with National Sample Survey Office (NSSO) data on household purchases from the PDS. Similar exercises for 2006–07 and 2007–08, based on annual rounds of the NSSO, lead to similar results: see Khera (2011a), Table 2. For an update, including evidence of a substantial improvement by 2011–12, see Drèze and Khera (2015).
- 2 On PDS reforms, see Khera (2011b), Drèze (2017a), and the literature cited there. On the PDS in Jharkhand (and its “parent” state, Bihar), see also Mooij (2001), Rahman (2014), Choithani and Pritchard (2015), Drèze et al (2015), Khalid (forthcoming), Menon (forthcoming), among others.
- 3 In Jharkhand, the remaining households are supposed to get a white ration card, valid for kerosene only. White ration cards are of no relevance to this paper, and are ignored throughout.
- 4 There are a few other exclusion criteria also, such as payment of income tax, but these are largely redundant (for example, any household paying income tax in rural Jharkhand is likely to meet some of the other exclusion criteria as well). On the logic of the exclusion approach, see Drèze and Khera (2010).
- 5 There is a great deal of confusion and disinformation about bogus ration cards and their alleged mass deletion using Aadhaar. The Prime Minister himself claimed in Parliament, on 7 February 2017, that 3.95 crore “fake cards” had been deleted, but this claim stands no scrutiny whatsoever. Briefly, routine renewal of ration cards in the process of implementing the NFSA has been confused with the deletion of so-called bogus cards (Khera 2017).
- 6 No sooner has the ink dried on this sentence than it needs to be qualified. In recent weeks, the website has gone through various modifications, and some of them have the effect of making the data less accessible or user-friendly (for instance, it is no longer possible to paste lists of ration cards into spread sheets). Also, transaction data are now restricted to the last two months, making retrospective analysis difficult.
- 7 This process took years in Jharkhand, and is yet to be completed. While most ration cards are “seeded” in the limited sense that at least one household member’s Aadhaar number has been seeded, many households do not have more than one or two members seeded, exposing them to the risk of exclusion when these particular members are unable to pass the biometric authentication test. Further, the task of verifying the seeded Aadhaar numbers is still in progress. Note that a similar process is required each time a particular scheme is linked with Aadhaar. This has led to a massive diversion of government functionaries’ time during the last few years in Jharkhand, where the development administration is short-staffed in the first place.
- 8 The effective entitlements of priority households, defined in per capita terms under the act, are based on the total number of household members listed in the ration card, irrespective of whether their Aadhaar numbers have been “seeded.” That, at any rate, was the situation at the time of the survey. At the time of writing, there is evidence of the Government of Jharkhand’s intention to restrict entitlements to only those household members whose Aadhaar number has been seeded, as is the practice in Telangana (Somanchi et al 2017).
- 9 In some areas, we also found that dealers did not inform people about the OTP facility, perhaps because authentication failures enable them to appropriate people’s rations—more on this subsequently.
- 10 Partial online is essentially a toggle system, where the system goes online when there is connectivity and operates offline otherwise. Only a small fraction of PDS outlets in Jharkhand operate under the partial online mode.
- 11 One of the four survey teams (posted in Koderma and Ramgarh districts) did not strictly follow the sampling guidelines. When a sample household was not available, the team interviewed the nearest available respondent, instead of the prescribed replacement household.
- 12 To these issues should be added the fact that some eligible households have no ration card (for example, because the SECC missed them). This issue, however, was beyond the scope of the survey since the sample households were selected from the list of ration cards.
- 13 The Government of Jharkhand has been announcing for some time that a web-based facility would be put in place to add the missing names. This facility, however, was yet to be activated at the time of the survey.
- 14 For the purpose of PER computations, household entitlements are calculated using the number of members on the ration card. This is not necessarily the same as their legal entitlements. For instance, a Priority household of five persons with one name missing on the ration card is entitled to 25 kg per month under the NFSA, but only 20 kg according to the ration card. Foodgrain allocations to ration shops are based on the latter, hence the focus on effective entitlements (based on ration card) rather than legal entitlements in this section.
- 15 Strictly speaking, this statement may not apply if a significant proportion of ration cards are “fake.” As we mentioned earlier, however, we found little evidence of that being the case in Jharkhand today.
- 16 There are various reasons for these discrepancies, such as recall errors on the part of survey respondents and occasional fudging of transaction records by enterprising dealers—we shall return to the latter.
- 17 The proportion of non-transacting households in the sample (36% based on RTs) would have been 50%, by construction, were it not for the fact that some sample villages had fewer than 20 non-transacting households.
- 18 It is also possible to estimate the proportion of non-transacting households in the sample blocks, but without distinguishing between online and offline areas. Excluding the four J-PAL control blocks, the proportion of non-transacting households in the sample blocks was a little over 20% in May 2017. Interestingly, transaction failure rates seem to be quite similar in Ranchi district, the sample blocks, and the sample villages.
- 19 A sample of case studies of such persons or households can be found at <https://goo.gl/vTdsog>.
- 20 Delays and disruptions in the supply chain also bear some responsibility for transaction failures. The fact that most transacting households reported receiving six months’ rations during the preceding six months (Table 3, third row) suggests that supply bottlenecks were mostly temporary. However, delays do contribute to transaction failures in specific months.
- 21 Some dealers are in no hurry to activate facilities such as the OTP and voice-over. Indeed, they benefit from transaction failures, or at least benefited from them at the time of the survey. The reason for this is that it was relatively easy for dealers, at that time, to appropriate the food rations of non-transacting households (this issue is discussed further on).
- 22 In Table 5, the reference group consists of households with non-missing data for both periods (pre-PoS and May 2017); this is to ensure that the figures for both periods refer to the same group of households. In addition, we exclude households with a PER greater than one in either period. Most of these are households that purchased double rations in May 2017, because they had missed on the April rations. If these households were to be included at all, their May 2017 PER should be calculated as the ratio of purchase to twice their monthly entitlements. We prefer to exclude them altogether. Indeed, double-quantity transactions are the counterpart of transaction failures (or rather, a partial counterpart, since transaction failures in one month are not typically made up by double transactions the next month). If we are excluding non-transacting households from the PER calculations, it makes sense to exclude households with double-quantity transactions as well. Transaction failures and double-quantity transactions are discussed separately.
- 23 The same may not apply to other commodities. For instance, many people do not seem to know how many litres of kerosene they are supposed to receive every month.
- 24 Aadhaar itself is of little help in preventing eligibility fraud in the PDS—this is worth mentioning since Aadhaar is often thought to have the power to ensure “better targeting.”
- 25 This pattern is clearly evident from the website records.
- 26 One possible reason is that in some offline villages the system used to be online, and then reverted to the offline mode because of the hassles of biometric authentication. In these circumstances it is not surprising that people have apprehensions about the machine, even if it works well enough in offline mode at the time of the interview. Another possible reason is limited battery life of the PoS machine, leading to delays (often for many days) in grain distribution. Some of the offline villages had no electricity connection, forcing dealers to make time-consuming trips to nearby towns to recharge the battery.
- 27 There are numerous media reports on these incidents. One of them is discussed in Drèze (2017b).

REFERENCES

- Choithani, C and B Pritchard (2015): “Assessing Bihar’s Coupon-based PDS,” *Economic & Political Weekly*, Vol 50, No 3, pp 61–68.
- Drèze, Jean (2016): *Social Policy: Essays from Economic & Political Weekly*, New Delhi: Orient BlackSwan.
- (2017a): *Sense and Solidarity: Jholawala Economics for Everyone*, Ranikhet: Permanent Black.
- (2017b): “Chronicle of a Starvation Death Foretold,” *Scroll*, 21 October.
- Drèze, J and R Khera (2010): “The BPL Census and a Possible Alternative,” *Economic & Political Weekly*, Vol 45, No 9, pp 54–63.
- (2015): “Understanding Leakages in the Public Distribution System,” *Economic & Political Weekly*, Vol 50, No 7, pp 39–42.
- Drèze, J, R Khera and J Pdussery (2015): “Food Security: Bihar on the Move,” *Economic & Political Weekly*, Vol 50, No 34, pp 44–52.
- Khalid, Nazar (forthcoming): “Aadhaar, Biometric Authentication and the Public Distribution System,” ideasforindia.in.
- Khera, Reetika (2011a): “Trends in Diversion of Grain from the Public Distribution System,” *Economic & Political Weekly*, Vol 46, No 21, pp 106–14.
- (2011b): “Revival of the Public Distribution System: Evidence and Explanations,” *Economic & Political Weekly*, Vol 46, Nos 44–45, pp 36–50.
- (2017): “Impact of Aadhaar on Welfare Programmes,” *Economic & Political Weekly*, Vol 52, No 50, pp 61–70.
- Menon, Sneha (forthcoming): “Aadhaar-based Biometric Authentication and Food Security,” to be published in *Indian Journal of Human Development*.
- Mooij, Jos (2001): “Food and Power in Bihar and Jharkhand: PDS and Its Functioning,” *Economic & Political Weekly*, Vol 36, No 34, pp 3289–99.
- Rahman, Andaleeb (2014): “Revival of the Public Distribution System: Expansion and Outreach,” *Economic & Political Weekly*, Vol 49, No 20, pp 62–68.
- Somanchi, A, S Bej and M Pandey (2017): “Well Done ABBA? Aadhaar and the Public Distribution System in Hyderabad,” *Economic & Political Weekly*, Vol 52, No 7.

EPWRF India Time Series

An online database on Indian economy structured in 16 modules developed by EPW Research Foundation, Mumbai



Key Features

- Ten modules with state-wise data
- Data availability in time-series format
- Data updated timely
- Easy downloading facilities with query options
- Export to Excel sheet
- Saves time spent on data compilation and very economically priced

Free Registration of the demo version will provide access to sample data for selected period for all modules.

To subscribe, visit www.epwrfits.in

EPW Research Foundation

C-212, Akurli Industrial Estate, Akurli Road, Kandivli (East), Mumbai - 400101.
Tel: (022) 2885 4995/96 & 2887 3038/41 | Email: its@epwrf.in | Web: www.epwrf.in