

Chapter 8

Incremental Reforms in Food Policy: What Are the Possibilities?

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8.1 Introduction

India's food policy is in a state of flux. This is a rare moment. Food policies and their governance have enjoyed stability and continuity for many decades. Indeed, the framework for these policies was set by the war-time interventions of the colonial government in India. Those interventions consisting of direct procurement of grain and rationed distribution had the object of securing food supplies for urban populations. Even though the objectives of food policy have mutated over the years, the interventions have not materially changed form despite changes in scale. The public distribution system (PDS) owes its origins to the rationing systems of World War II. The Food Corporation of India (FCI), the principal Central government parastatal responsible for foodgrain procurement and storage, was set up in the mid-1960s. The practice of offering support prices to rice and wheat also dates from that period. The series of reforms since 1991 that saw greater integration of India with world markets along with greater freedom for entrepreneurial activity left the food and agricultural sector largely untouched.¹

In recent years, however, India's food policy and its institutions have been repeatedly challenged. The stunning growth of the economy in the 2000s has not been accompanied by commensurate improvement in indicators of poverty and nutrition. Politically, such dissatisfaction has taken the form of a promise of a 'right to food' by the United Progressive Alliance (UPA) that returned to power in India's general elections of 2009. This campaign promise has now seen the introduction of

¹For accounts of India's early food policy, see Bhatia (1970) and Chopra (1981).

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a National Food Security Bill (NFSB) in the Parliament. The run-up to this bill has been contentious as the government advisors, media and the independent experts debated alternatives that can effectively deliver the right to food.

While these debates have been about food policy of the Central government, they have been informed, in part, by attempts to reform procurement and distribution systems by some State governments. It is widely agreed that PDS reforms are essential for the success of a food security act. Hence these reforms at the state government level are experiments that may chart the future course of food policy. The dynamics of policy and implementation are also influenced by a third factor—the judiciary. In 2001, the People’s Union of Civil Liberties filed a public interest petition in the Supreme Court of India demanding judicial oversight of the State’s food intervention. They argued that the right to food derives from the right to life that is guaranteed by the Constitution. The case is still ongoing. However, the Court has been sympathetic to the petition and has passed a wide range of ‘interim’ orders. The Court has also appointed Commissioners to monitor the compliance of these orders. Most of the orders relate to legal enforcement of existing government programs. Some orders have expanded the scope of government programs while others have pressed for reforms such as the computerization of the subsidy network.

For all the above reasons, there is a real possibility that India’s food policy institutions may look quite different in a decade from now. The goal of this paper is to take a rapid tour of the reform possibilities in the areas of storage and logistics, procurement and distribution. The focus is on incremental reforms rather than systemic reform. As a result, the paper excludes food policy issues concerning targeting and cash transfers. These two issues are important and indeed, have dominated the debate about the NFSB. However, apart from the fact that we wished to keep the study to manageable limits, these issues have already received much attention. In our review of existing policies in Sects. 8.2 and 8.3, we point to the formidable difficulties of targeting and how targeting, in practice, leads to substantial exclusion of the poor. There is a fairly large consensus among economists that a food security bill dependent on targeting would be self-defeating.² Whether a food subsidy system should move in the direction of cash transfers has also been examined in previous work.³ The focus of this paper is on reforms that are already on the ground and relevant to implementation. This is, of course, not to minimize the desirability of reforms that enlarge the access of poor whether through targeting reforms or through direct cash transfers.

An exercise of this sort has to be sensitive to the federal structure within which food policies are implemented. While the Central government is largely responsible for funding, procurement and transport of grain to the States, the implementation and delivery of food subsidies is in the hands of the States. The PDS is a shared

²Dreze and Khera (2010), Himanshu and Sen (2011). See also the op-ed pieces, A Simple Proposal on Food Security, *The Hindu*, March 2012 (<http://www.thehindu.com/opinion/op-ed/article2985212.ece>), and It Simply Can’t Fail, *The Hindustan Times*, February 28, 2012 (<http://www.hindustantimes.com/News-Feed/ColumnsOthers/It-simply-can-t-fail/Article1-818569.aspx>).

³Chaudhuri and Somanathan (2011), Kotwal et al. (2011).

responsibility of the Centre and the States and, therefore, PDS reforms have to be understood with reference to policy initiatives (and their associated political economy) at the Centre as well as the States. For this reason, this paper is informed by case studies of food policy structures in three states: Chhattisgarh, Gujarat and Madhya Pradesh.

Sections 8.2 and 8.3 are summary overviews of the food policy outcomes and the present policy context. Section 8.4 looks at the topical problem of insufficient storage capacity and proposes a method for determining the needs for seasonal storage from which targets of capacity creation can be derived. Section 8.5 argues that insufficient storage is one side of the coin. The other side is consistently excess procurement. Incremental reforms to address this issue are considered here. Procurement reforms are considered in Sect. 8.6. The following section lays out the principal components of reforms in distribution. These are pursued in greater detail in Sect. 8.8 in the context of three states: Chhattisgarh, Gujarat and Madhya Pradesh, all of which have received attention for their attempts at reforms. The findings are brought together in Sect. 8.9.

8.2 The Theory and Practice of Food Policy Interventions

The principal instruments of food policy in India have been price supports (and public procurement) and subsidised food distribution to the poor. The chief justification of price supports is that it offers insurance to risk averse farmers against low price outcomes. This is valuable because successful risk markets such as futures markets do not exist for all commodities. Even when they do, direct participation by farmers is limited. Innes (1990) showed that consumers too could gain from price supports as the supply response to price insurance lowers food prices.

Even with complete markets, the market solution in poor countries produces outcomes that involve unacceptably low food consumption for the poor. The equity objective of food market intervention is to augment the food consumption of such target groups. This is accomplished by offering subsidies on such consumption. Quite clearly, procurement and subsidised food distribution go hand-in-hand. However, there could well be alternative mechanisms of offering price insurance to farmers and subsidised food to poor consumers.

Our identification of price supports and subsidised food distribution as the principal instruments of Indian food policy can be contested. What about public storage and open market sales to achieve price stabilization? However, it is our argument that these have not been independent instruments—rather they have been outcomes of the principal mechanisms of food policy. With a solitary exception, procurement has exceeded subsidised distribution in every year since 1989/90. If the intent was to stabilize consumption, the difference between procurement and subsidised distribution should cumulatively sum to zero over a long enough period of time. Indeed, this is exactly what used to happen in the period prior to 1989/90 (Ramaswami 2002). Of course, the government cannot consistently buy more than it sells without building up

a mountain of grain. This is exactly what happened towards the late 1990s and then again after the mid-2000s (Planning Commission 2005). The growth of entitlement programs such as the increase in household entitlement to subsidised grain, school feeding programs and the de facto expansion of subsidies (achieved by not raising the subsidy price of rice and wheat since 2002) have been facilitated by these surpluses with the government. However, while they have increased the commitments of the government, procurement has increased faster. Stock depletion is accomplished by various ad hoc measures including exports (usually subsidised) and open market sales. Both of these are ad hoc measures and India does not have an announced protocol by which exports and open market sales take place.

In practice, food policy interventions have had impacts different from their theoretical rationale. Although price supports are chiefly justified by appeal to price insurance, the administered prices in India have served to set market prices rather than to support them. The early literature on price supports drew a distinction between support and procurement prices. The idea was that support prices would be below market clearing prices that obtain in normal conditions and be operative only in times of glut. In order for support prices to serve their function, the government is obligated to buy whatever is offered at this price. Procurement for subsidised distribution would occur at procurement prices which would have to be competitive with market prices. Procurement, however, would be confined to the quantities required for distribution. This distinction between support and procurement prices has, however, been lost in Indian food policy. This is clear from the discussion in the earlier paragraph.

The use of procurement to funnel resources to farmers in favoured regions has its limits, however. Whenever there is a threat of sharp increase in food prices, such as during the commodity boom of 2006–2008, the government imposes bans (official and unannounced) of various kinds—on procurement of grain by private players, on exports of rice and wheat and on futures contracts in many agricultural commodities. The ban on private players and on grain exports bought the government some stability and enabled it to procure grain cheaper than what would have been possible otherwise. However, at these times, government policy does directly conflict with the interest of farmers.

Grain procurement has had several impacts on the wider agricultural economy of India (Landes and Gulati 2004; Saxena 2004). Land and other resources have shifted to the State supported crops of rice and wheat. While this was understandably the original intent of State policies formulated in the period of acute food shortage of the 1960s, it is not clear whether this is appropriate today when the demand for non-staple foods such as dairy, fats, fruits and vegetables are growing faster than the demand for grains. Second, the cost-effective strategy for procurement is for the buying agencies to focus attention on the ‘surplus’ regions of North India, namely Punjab, Haryana and Uttar Pradesh. This has led to complaints of lack of price support operations in other parts of India, notably the eastern region. These are regions with conditions favorable to agricultural growth; yet it is claimed that they have not emerged as effective food exporters because of the concentration of resources in North India. More generally, because of the availability of

Table 8.1 Issue prices and market prices for rice and wheat, Rs/kg

	2004/05		2009/10	
	Rice	Wheat	Rice	Wheat
POP issue price	3	2	3	2
BPL issue price	5.65	4.15	5.65	4.15
APL issue price	7.95	6.1	7.95	6.1
Median market price	10.75	9	18	14
Median market price of bottom 4 deciles	10	8	15.5	12.08

Source Issue prices are from economic survey, Government of India; market prices are computed from NSS expenditure survey data

subsidised grain, the ‘deficit’ states have neglected price support to their own farmers and continue to remain food deficit. Third, procurement may be adverse to the long-term interests of even the favored regions. The summer rice–winter wheat rotation has environmentally degraded the lands in these regions. Fourth, procurement has nothing to offer to the farmers growing the so-called ‘coarse cereals’ (principally sorghum and millet). These are hardy low productivity crops typically grown in semi-arid regions that have no irrigation. These crops have suffered from ‘policy neglect’ because of the focus on rice and wheat.

Turning to subsidised food distribution, the most substantive initiative in reforming food policy in the five decades after independence was the introduction of the targeted subsidies (Targeted PDS or TPDS) in 1997. Subsidies depend on whether the household is classified as above poverty line (APL), below poverty line (BPL) or poorest of the poor (POP) identified by the Antayodaya Anna Yojana program. Table 8.1 displays the issue prices for the various categories of beneficiaries as well as prices paid by households for grain from market sources for the years 2004/05 and 2009/10. The prices paid by households are computed from the consumption expenditure surveys of the National Sample Survey Organization (NSSO). The table reports the median price paid by households for market grain. The table also reports the median price paid by the bottom four expenditure deciles of households. We report this because the grain supplied in the PDS is typically of low quality and therefore corresponds better to the market grain purchased by low income households. In principle, the prices of subsidised grain are supposed to be fixed with reference to the government’s “economic cost”, i.e., the cost incurred by government agencies in procuring, storing, transporting and distributing grain. BPL households are supposed to receive 50 % subsidy (i.e., 50 % of economic cost) while APL households are not supposed to be eligible for any subsidy at all. The prices for POP households are fixed below that of BPL households and not with reference to economic cost.

In practice, the subsidised prices fixed in 2002 have not been revised despite increases in economic cost. Figure 8.1 plots the BPL and APL issue prices of rice as a percentage of the procurement price of rice and also its economic cost. The procurement price of rice is representative of the wholesale price of rice at harvest

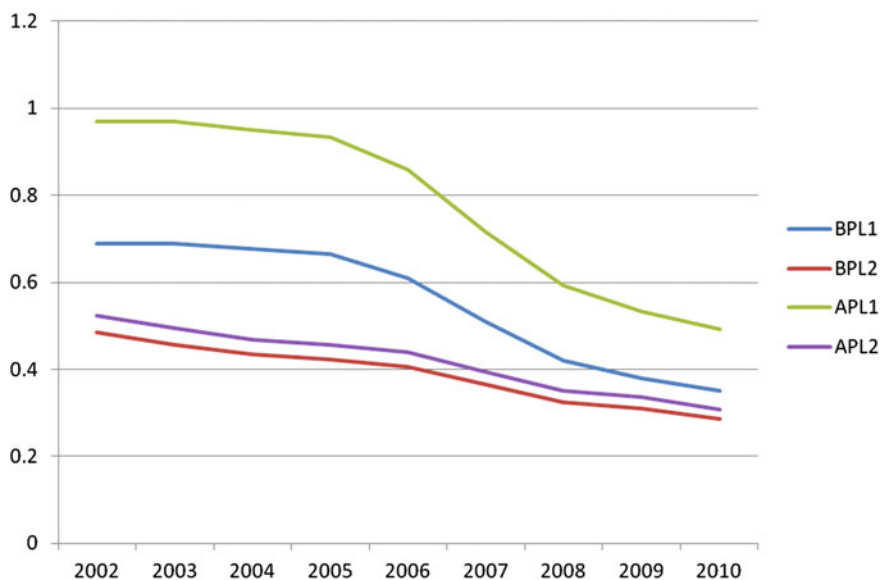


Fig. 8.1 Rice issue prices as a proportion of procurement price and economic cost. *Notes* *BPL1* The BPL issue price of rice as a proportion of procurement price of rice, *BPL2* The BPL issue price of rice as a proportion of the economic cost of rice, *APL1* The APL issue price of rice as a proportion of procurement price of rice, *APL2* The APL issue price of rice as a proportion of the economic cost of rice. *Sources* Data is obtained from various issues of the economic survey. The paddy procurement price has been converted to a rice procurement price assuming a conversion ratio of 0.67

while the economic cost is a close approximation of the retail price.⁴ The graphs for wheat are almost identical and therefore not reported. It can be seen from Fig. 8.1 that even the APL households receive a subsidy in excess of 50 % of economic cost.

Presently, all households are entitled to a monthly quota of 35 kg of rice or wheat per month. The qualification to this is that the central government does not guarantee full grain supply to the state governments for its APL requirements. The actual allocation depends on past purchases and ad hoc considerations. As a result, the grain quota of APL households ranges between 10 and 35 kg per month across different states. In recent years, some State governments have departed from the norms of the Central government with respect to entitlements of BPL and APL groups with respect to price and quantity.⁵ However, the centrally decided parameters of entitlements and issue price remain the basis for allocation of grain to the States and the price that is charged to them.

⁴In fact, as we shall point out later, the economic cost could be higher than the retail price.

⁵See Table 3 of Khera (2011).

The total number of households within a state that are eligible to be classified as BPL is made through an expenditure sample survey administered by the Central government (the consumer expenditure survey of the National Sample Survey Organization). The list of BPL beneficiaries is prepared through a separate BPL census. In the latest census of 2002, households received scores based on 13 criteria. The BPL households were identified as those who fell below a cut-off score (which was decided by the respective state governments). If the total of BPL identified households exceeds that which is estimated by the Central government, the subsidy on the excess households has to be borne by the State government.

The National Sample Survey (NSS) of consumption expenditures of households of 2004/05 shows that only 40 % of rural poor households and 27 % of urban poor households (i.e., households with expenditures less than the official poverty line) possessed either a BPL or a POP entitlement (Jha and Ramaswami 2010). This is the exclusion error of targeting. The remainder of poor households either had no entitlement or an APL entitlement. The inclusion error of targeting is the proportion of BPL and POP beneficiaries that are non-poor. This is 68 % in rural areas and 51 % in urban areas. High inclusion errors are to be expected. First, since there are benefits from being categorized as BPL or POP, the process of identification of poor is vulnerable to manipulation and capture by non-poor groups. Second, it is hard in practice to distinguish households who are just above the poverty line from those just below it. India's official poverty line measures bare subsistence and so households above this threshold may also exhibit signs of income stress. Indeed, 70 % of BPL and POP beneficiaries in rural areas and 78 % in urban areas are households with expenditures less than 1.5 times the poverty line (Jha and Ramaswami 2010).

Among the poor that have BPL or POP entitlement, only 61 % use the PDS. This suggests that many poor households do not find the PDS convenient. Case studies have thrown up a variety of reasons such as the limited liquidity of poor households (as ration entitlements can be accessed only once every fortnight rather than continuously), uncertain ration supplies, inferior quality of PDS grain, irregular hours of PDS shops and their inconvenient location. Ramaswami and Balakrishnan (2002) show that consumers perceive PDS grain to be of lower quality even though the government does not set out to procure such grain. This is a deadweight loss that occurs due to inefficiencies in the government marketing chain.

The PDS has also been criticized for illegal diversions and for excess costs of the State agencies. Illegal diversions happen as agents in the government marketing chain sell the subsidised grain in the open market and profit from the difference between the market price and the subsidy price. Excess costs occur when the cost of procuring and distributing grain is higher for the state agencies than for the private sector. Jha and Ramaswami (2010) show that, in 2004/05, 55 % of the subsidised grain was illegally diverted.⁶ They also show that only

⁶The diversion estimates from the recently released survey data for 2009/10 are of the order of 41 %.

29 % of the total food subsidy expenditures by the government reached the households. The remainder of 71 % was absorbed by excess costs (28 %) and illegal diversions (43 %).

8.3 Reforming the PDS: The Debate

In 2011, the Central government introduced a National Food Security Bill in the Parliament. The intent is to create legal entitlements to subsidised food for the poor. Two issues have been prominent in the debates about this bill. The first issue is about the scale of the food subsidy program. Should it continue as a targeted program or should it have universal access? The second issue is about the form of the subsidy program. Should the subsidy program be modeled on the public distribution system or are there alternative and more efficient forms of delivery?

Regarding the first issue, the draft of the NFSB that is publicly available commits the government to reach food subsidies to 75 % of the rural population and 50 % of urban population. Thus, the coverage has been extended from existing levels to what has been called “near-universal” coverage. This would mean a PDS that operates on a larger scale. However, the near-universal coverage has not put an end to targeting. Firstly, the government still has the task of excluding 25 % of the rural population and 50 % of the urban population. Secondly, the draft bill proposes differential subsidy entitlements to what they call ‘priority’ and ‘general’ households. Thus, while near-universal coverage would help in ensuring that most of the poor receive some subsidy, the new proposals do not do away with targeting. The government still needs a way to exclude ineligible households and within eligible households to further distinguish priority from general households.⁷

Regarding the second issue, the draft bill sees the PDS as the instrument of subsidy delivery in the principal provisions relating to obligations of the government and the entitlements of individuals. However, another chapter of the bill commits the Central and State governments to undertake necessary reforms of the PDS including alternatives such as cash transfers and food coupons. It is not clear how these inconsistencies, possibly reflecting different views within the government, will be sorted out in the final version.

Most informed observers agree about the sub-optimal outcomes of procurement and subsidised food distribution. Yet there are very different views about the direction of desired reforms. The typical advice from multi-lateral institutions and “market-oriented” economists is to target subsidies, open state agencies to competition and to move away from in-kind transfers to cash transfers. Civil society organizations, on the other hand, believe that subsidies ought to be universal and that private sector should not be involved in their delivery. They therefore oppose cash transfers and advocate legal entitlements so that communities are empowered

⁷Press reports suggest that revisions of the bill propose a uniform entitlement to all the eligible population removing the distinction between priority and general households.

to demand accountability from state agencies. The government speaks in many voices reflecting its varied constituencies. While it speaks of fiscal consolidation when subsidies are to be cut, it also speaks of farmer rights when increasing procurement prices, economic justice when expanding entitlements and consumer interests when imposing import bans.

The political economy of food policy presents knotty issues and achieving a balance between conflicting interests is a problem that is not necessarily unique to India. Timmer (2010) draws a contrast between those who place distribution concerns above all else and those who place efficiency concerns above all else. He poses the following questions. “When ‘politics is in command’, which seems to be the normal state of affairs for most developing countries, how do efficiency issues stay on the agenda? When ‘markets are in command,’ which seems to be the main policy advice from the donor community to poor countries, how do distributional and welfare issues stay on the agenda?”

What then is the appropriate balance between “politics” and “markets” in the practice of food policy and can it be achieved? One answer is provided in Kotwal et al. (2011). They argue that the massive exclusion errors of PDS targeting question the continuance of targeted programs. Till a reliable way of identifying the poor is found, a near-universal coverage would be necessary to avoid exclusion errors. Distribution concerns must dominate here. On the other hand, there is no reason to tolerate the leakage of resources from the program. Therefore, markets in the form of cash transfers ought to be considered to restore efficiency in the delivery of food subsidies.

As the issues of balance between politics and markets with respect to the grand design of food policy have already been analyzed, this paper does not pursue it any further. However, the paper uses this perspective to assess the prospects of ‘incremental reform’ in (a) storage and procurement and (b) distribution.

8.4 Storage and Logistics: How Much Capacity Is Needed?

Since 2010, the problem of insufficient storage capacity has attracted both political and media attention. In print and television, commentators have bemoaned that the country could let grains rot when there are people that go to bed hungry.⁸ Similar comments have echoed in the country’s Parliament.⁹ In September 2010, the

⁸For example, <http://www.hindustantimes.com/India-news/NewDelhi/Food-grains-rot-in-FCI-godowns-across-India/Article1-578444.aspx>, <http://indiatoday.intoday.in/story/foodgrains-rot-in-india-godown-no-space-to-store-bumper-crop/1/142399.html>, <http://ibnlive.in.com/news/food-grains-rotting-due-to-poor-storage-in-punjab/111709-3.html>.

⁹For example, <http://www.mid-day.com/news/2010/sep/010910-Sushma-Swaraj-Lok-Sabha-food-grains-Rotting.htm>, <http://www.deccanherald.com/content/148406/grave-concern-rs-over-rotting.html>.

Table 8.2 Seasonal pattern in the consumption of rice and wheat, per capita and per month

Quarter	Rice + wheat	Rice	Wheat	Rice + wheat	Rice	Wheat
	kg			Index with July–September = 100		
July–September	11.70	6.00	4.32	100	100	100
October–December	11.55	5.90	4.16	96.29	96.29	96.29
January–March	11.58	5.99	4.08	94.27	94.27	94.27
April–June	11.44	5.94	4.38	101.35	101.35	101.35

Source Our computations from NSS consumer expenditure survey, 2009/10

Supreme Court hearing the Right to Food public interest petition asked the government to distribute to the poor, the foodgrains that would otherwise rot. The mismatch between stocks and capacity has if anything worsened. An internal note of FCI accessed by a newspaper predicts stocks of 75 million tons by June 2012. The note warns that “FCI and state agencies will neither have the storage capacity nor the manpower to manage such a substantial increase in stock in central pool” (Times of India, April 23, 2012).¹⁰

It is useful to break up the issue into two questions: how much storage capacity is required for public stocks and second, what policies will bring capacity in line with grain purchases. The first question is tackled in this section while the second question is discussed in the following section.

An analysis of the first question is non-trivial because stocks fluctuate over time depending on harvest, price support and market prices. Clearly, then capacity that is sufficient at any one point of time can be too little or too much at other times. In this section, we offer a simple method for determining the needs for seasonal storage.

As India’s volume of marketed surplus grows, so will needs of storage and transport. This is independent of whether we have a PDS or not. In the late 1990s, the marketed surplus of rice was estimated to be 52 % of output and that of wheat to be 54 % of output (Department of Food and Public Distribution 2002). With a total output of about 180 million tons (of rice and wheat), the marketed surplus is then in the range of 90–95 million tons. Crop harvests occur at finite discrete points (Rabi in the case of wheat and predominantly kharif in the case of rice) while consumption is continuous through the year. Hence the crop needs to be carried from the harvest months to the other months when there is no harvest. This constitutes the demand for seasonal storage.

Table 8.2 displays the per capita consumption of foodgrains, wheat and rice across quarters. The consumption data show that there is no seasonal pattern in the consumption of cereals. Therefore, if x is the total annual consumption of grain, the consumption in any quarter is roughly $(x/4)$. For a crop like wheat which is harvested at only one time in a year (April–May), this means that grain must be carried to other periods in the year. Hence there is high demand for seasonal storage. Rice

¹⁰http://articles.timesofindia.indiatimes.com/2012-04-23/india/31386742_1_lakh-tonnes-fci-and-state-central-pool.

is principally a kharif crop with harvests in October–November. There are harvests at other times in the southern and eastern parts of the country. However, these are much smaller and therefore the pre-dominant seasonal demand for rice storage comes from the need to carry the kharif harvest to the rest of the year.

The seasonal demand for storage can be worked out from the principle that grain must be allocated equally over time. The first step is to compute the marketed surplus. Following earlier discussion, we assume a marketed surplus of 50 million tons for rice and 40 million tons for wheat. Second, we assume that the portion of output that is consumed on-farm does not require commercial storage in the form of godowns and silos. Third, because this is a model of seasonal storage, we assume that there are no carry-overs of grain from one marketing year to another. Fourth, it is assumed that in the periods of production, the consumption demand is instantaneously met without any need of storage (in the form of godowns and silos). Of course, some very short-term storage would be required—whether in shops or in transit.

Thus for instance, at the beginning of October—which is the kharif marketing season, there are no carry-overs of rice from the previous marketing year. At the beginning of the next quarter, starting January, the carry-overs are 3/4ths of the marketed surplus of 50 million tons which is then progressively reduced to 1/2 and 1/4th of the marketed surplus in the succeeding quarters. A similar scheme can be worked out for wheat. Storage requirements taper off at the end of the marketing years for rice (September) and for wheat (March) respectively. The results are displayed in Table 8.3.

The peak demand for storage occurs on January 1 and this constitutes the storage capacity that must be planned for. This means that storage capacity of about 50 million tons is the current requirement and that such requirement would proportionally increase with marketed surplus. For instance, the projected output for 2013/14 is 86 million tons of wheat and 106 million tons of rice (Economic Advisory Council 2011). This would result in a marketed surplus of around 43 million tons of wheat and 53 million tons of rice. The logic of Table 8.2 means that the maximum demand for storage would occur in Jan 1 and it would be 3/4th of the marketed surplus of rice and 1/4th of the marketed surplus of wheat. Even with these expected projections, the demand for seasonal storage for rice and wheat is unlikely to exceed 60 million tons in the immediate future. It should be emphasized that if estimates of marketed surplus are different from what we assumed, our method can still be used to determine seasonal storage requirements.

Table 8.3 Demand for storage at the beginning of each quarter, million tons

	Rice	Wheat	Total
July 1	12.5	30	42.5
Oct 1	0	20	20
Jan 1	38.5	10	48.5
April 1	25	0	25

Source Our computations based on methodology explained in the text

What about the storage needed for public stocks? Table 8.4 displays the official norms for minimum buffer stocks held by the government. If the government stocks were to follow these norms closely, government needs a storage capacity of 32 million tons. The buffer stock norms for wheat follow the logic of Table 8.3 with stock levels consistently declining from July 1. However, because of the need to carry reserves across the year, the norm at beginning of April is 7 million tons. Rice procurement takes place in the first and last quarter of the calendar year. Hence the rice buffer stocks norms do not display the marked seasonality present in the storage demand calculations of Table 8.3.

With the passage of Food Security Act, it is expected that grain procurement would go up. The Rangarajan Committee estimated a food distribution requirement ranging from 64 to 74 million tons of grain. These estimates do not include the split between rice and wheat. Historically, rice distribution has been nearly 2/3rds of total PDS sales. However, this was marked differently in 2009/10 when wheat distribution rose to almost half of PDS sales. With a 60–40 split between rice and wheat, rice and wheat procurement in the two scenarios is given in Table 8.5. Using the logic of Table 8.3, the peak storage demand arrives on January 1 when 3/4ths of rice procurement and 1/4th of wheat procurement would need to be stored. This is calculated in the adjacent columns. To this we must add the requirements of emergency/strategic reserves of 5 million tons.

The total peak storage would therefore be around 46 million tons. Note the above table assumes that rice procurement happens only in the last quarter of the calendar year when in fact it happens also in the first quarter of the calendar year. As a result, Table 8.5 assumes more seasonality in procurement and storage than what actually obtains. Hence the peak storage requirement calculated above is an upper bound. How does this compare to existing capacities?

The Food Corporation of India (FCI), the central government agency responsible for procurement and storage of grain for the PDS, has a storage capacity of 32

Table 8.4 Official norms for government storage, million tons

	Rice	Wheat	Total
July 1	11.8	20.1	31.9
Oct 1	7.2	14	21.2
Jan 1	13.8	11.2	25
April 1	14.2	7	21.2

Source Various issues of economic survey, Government of India

Table 8.5 Demand for storage by government under the national food security bill, million tons

Scenarios	Total procurement	Rice procurement	Wheat procurement	Rice storage on Jan 1	Wheat storage on Jan 1	Total storage on Jan 1
1	64	38.4	25.6	28.8	6.4	35.2
2	74	44.4	29.6	33.3	7.4	40.7

Source Our computations based on methodology explained in the text

million tons. Over the past five years, the capacity has fluctuated between 24 and 29 million tons. About half of the capacity is hired and this gives FCI some flexibility in changing capacity. Most of the capacity exists in the form of godowns. About 10 % of storage is Cover and Plinth (CAP) storage. Here foodgrains are stored in the open (but on an elevated platform) covered by special polythene covers. Such storage is of lower quality and its use has sometimes been criticized. About half a million tons of storage capacity is in the form of silos. Unlike godowns where grain is packed and stored in jute sacks with no climate controls, silos are structures for bulk storage under climate controlled conditions. Usually, silos also have other facilities for bulk handling like weighing, drying and transport.

About 30 million tons of storage capacity also exists with the Central Warehousing Corporation and the state warehousing corporations. Since FCI hires about 14 million tons of capacity from these corporations, total public sector storage capacity is about 48 million tons. Of course, not all of the capacity in the state and central warehousing corporations is available for foodgrains; it is also used for other agricultural and industrial goods. Assuming that the FCI has hired all the capacity that is possible from the Central and State Warehousing Corporations, then the gap between the FCI's existing capacity (32 million tons) and the required capacity (46 million tons) is about 14 million tons. If the CAP storage is to be done away, the gap rises to 17 million tons. Coincidentally, in the 11th plan, the FCI identified a gap of 16 million tons of capacity that needed to be created. Government funding restricted new capacity creation to the newly emerging procurement States, hill states and the states in the North-East.

The slow pace of capacity creation, the pressures of existing stocks and the possibility of a substantial expansion of the PDS because of the Food Security Act have all created a climate of urgency on construction and modernization of storage facilities. The calculations in Table 8.5 suggest that the gap in capacity is about 17 million tons of which about a small amount of additional capacity has been created.

8.5 Matching Storage Capacity to Procurement

While additional capacity of the magnitudes identified in the earlier section would help, the pressures are unlikely to cease. Peak stocks in 2010 and 2011 were 60 million tons and above. Peak stocks in 2012 went beyond 80 million stocks. Going by these levels, the additional capacity required is of the order of 30–35 million tons. This level is way higher than our calculations of seasonal storage requirements (together with emergency reserves) even with an expanded PDS that confirms to the Food Security Act.¹¹ What explains this discrepancy?

¹¹In our evaluation of gaps between capacity and demand, we are ignoring here possible spatial mis-matches. For instance, the gaps are particularly severe in the so-called 'non-traditional States' that are now contributing to the procurement pool (Andhra Pradesh, Chhattisgarh).

Our computations of peak seasonal storage capacity are based on government's commitments to the public distribution system. Similarly, it is also the basis for the official norms on buffer stocks. However, what the government buys from farmers i.e., procurement does not match the PDS requirements. This can be seen from Fig. 8.2 which plots the annual figures for procurement and PDS sales. Since the early 1990s, procurement has consistently exceeded PDS sales. This is also the explanation why there have been recurrent crises of excess stocks and therefore storage capacity. It should be noted that this happened when the annual PDS commitment was about 30–40 million tons.

The explanation for why the government ends up acquiring stocks greater than what it needs for the PDS is complex. What is clear is that the difference is too large to be explained by the need for emergency reserves. The explanation lies in the procurement process and the fixation of the procurement price. For a hypothesis in this regard, see Kotwal et al. (2011) below.

Since the 1990s, with the exception of a single year, the government has bought more grain than it has sold through the PDS. Of course, the politics around the procurement price is a proximate reason. But there are other reasons too: most notably government miscalculation. At the higher levels of the government, there is immense paranoia about food shortages affecting the PDS. Politicians and bureaucrats perceive the costs of insufficient supplies but nobody is held accountable for excessive stocks and high prices. Predictably, the errors are in one direction. A near-universal PDS will considerably amplify the tendency of the government to carry excess stocks. Private trade will be displaced and so excess stocks in any one year continue to the next unless the cycle is broken by an exceptional event such as a drought.

The implication is that as long as the key structure of the procurement system is unreformed, there will always be a tendency to accumulate excess stocks. Indeed, it

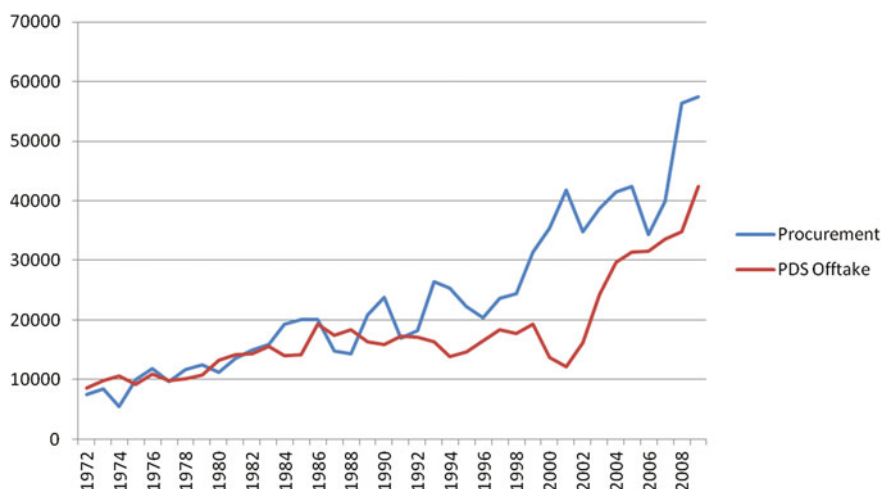


Fig. 8.2 Procurement and PDS sales. *Source* From government documents, economic survey and website of Food Corporation of India

is likely, that an expanded PDS (consistent with the National Food Security Bill) will reinforce this tendency and the government may well carry stocks in excess of what has been even observed so far. With a Food Security Act, the government has a legal obligation to meet the requirements of the PDS. A failure, here, would not only be politically costly but could also result in legal sanctions. For this reason, a food security act will amplify the tendency to “play it safe”. However, from a social point of view, it is not clear that support for capacity creation ought to be guided by expectations of policy errors that cannot be sustained indefinitely. As noted earlier, there is a demand for higher capacity that flows from the growth process. In addition, there is the specific demand for capacity in the public sector because of PDS commitments. Such demands are easy to quantify and plan for. The demand that flows from ‘too high’ procurement prices is harder to anticipate and therefore potentially risky to plan.

One way out is to have a systematic policy of open market sales. Basu (2011) proposed a mechanism of selling grain in small batches to many traders and consumers to maximize the impact of open market sales on prices. His proposal was made in the context of market stabilizing intervention where procurement varies according to available supplies. But as we have seen, the foodgrain intervention has been systematically biased towards procurement in excess of distribution. Hence the socially beneficial first best policy here would be to reduce procurement rather than increase capacity creation (beyond that identified in the earlier section) or to accumulate stocks and then to dispose it in the open market.

The ideal reform would be to move procurement from being open-ended to being closed-ended so that it better meshes with the PDS. Currently, the procurement system is open-ended in the sense that the government is committed to buy whatever farmers wish to sell. A closed-ended procurement process would be one where the government buys only that much grain as to meet its distribution requirement.

Such reform of the procurement process will be hard. States that gain from open-ended procurement will oppose such a move. The government uses a thumb rule of using the peak level of stocks of the last 3 years to calculate the storage gap (Planning Commission 2011, p. 50). While this is a pragmatic response, it should be understood that the consequence is that storage capacity will lurch from one crisis to another. If capacity is insufficient today, the use of thumb-rules will ensure that it is in excess tomorrow. This has happened even in the recent past. Table 8.6 is reproduced from a report on the PDS submitted to the Planning Commission (Planning Commission 2011). This shows the total and net hiring of storage space by the FCI from 2001 to 2011. It can be seen that in response to ‘excess stocks’ crisis of the early 2000s, the FCI hired as much as 20 million tons of capacity in 2002. As the crisis eased, the FCI ‘de-hired’ the space till it dropped to a low of 8.7 million tons in 2008 after which it again begin to rehire space. While hiring, in principle, offers easy entry and exit into capacity, long-term contracts that are usually used preclude it. The government auditor, C&AG pointed out to the non-utilization of hired capacity in the 2000s and hence ‘avoidable’ expenditure of over Rs. 1000 crores for the three year period ending March, 2007. As the Planning

Table 8.6 Hiring de-hiring of capacity since 2001–2002 (figures in lakh MT)

Position as on		Covered	Cap	Grand total
		Hired	Hired	
31.3.2001	Capacity	120.97	44.61	165.58
31.3.2002	Capacity	151.6	55.85	207.45
31.3.2003	Capacity	137.7	28.78	166.48
31.3.2004	Capacity	108.5	13.64	122.14
31.3.2005	Capacity	104.61	4.13	108.74
31.3.2006	Capacity	99.05	5.09	104.14
31.3.2007	Capacity	93.42	6.32	99.74
31.3.2008	Capacity	87.13	0.27	87.4
31.3.2009	Capacity	101.24	0.15	101.39
31.3.2010	Capacity	128.9	4.69	133.59
31.03.2011	Capacity	154.59	5.44	160.03
31.05.2011	Capacity	164.86	7.02	171.88
Net hiring (01–02)		30.63	11.24	41.87
Net hiring (02–03)		–13.9	–27.07	–40.97
Net hiring (03–04)		–29.2	–15.14	–44.34
Net hiring (04–05)		–3.89	–9.51	–13.4
Net hiring (05–06)		–5.56	0.96	–4.6
Net hiring (06–07)		–5.63	1.23	–4.4
Net hiring (07–08)		–6.29	–6.05	–12.34
Net hiring (08–09)		14.11	–0.12	13.99
Net hiring (09–10)		27.66	4.54	32.2
Net hiring (10–11)		25.69	0.75	26.44

Source Working group on reforms in the public distribution system and better targeting of food subsidies during the 12th plan period (Planning Commission 2011, p. 42)

Commission report (2011) points out, such criticism led to de-hiring of storage space between 2002/03 and 2007/08. However, “the de-hired storage space was not always available for re-hiring once procurement started rising again from 2008–2009 onwards.” (Planning Commission 2011, p. 43) (Tables 8.7 and 8.8).

While a closed-ended procurement process would meet political difficulties, incremental reform may be possible. First, if the expanded obligations under the Food Security Act are met by a mix of transfers in-kind and in cash, it will restrain the pressures on procurement. Second, it is important to unbundle the procurement for PDS from the procurement for buffer stocks. This can be done by creating a new agency called, say, the “Risk Management Agency” (RMA). The FCI’s liability will remain limited to the grain purchased for distribution requirements. The stocks in excess of this requirement should be transferred to the books of the RMA. Such an arrangement will make excess stocks visible in financial accounts and therefore garner attention from economic and political observers. This might therefore force the government to take excess stocks into account when deciding on procurement prices.

Table 8.7 States with decentralized procurement

S. No.	Name of the state	Procurement of items
1.	West Bengal	Rice
2.	Uttar Pradesh	Rice/Wheat
3.	Madhya Pradesh	Wheat
4.	Chhattisgarh	Rice/Wheat
5.	Uttaranchal	Rice/Wheat
6.	Andaman and Nicobar Islands	Rice
7.	Orissa	Rice
8.	Tamil Nadu	Rice
9.	Gujarat	Wheat
10.	Karnataka	Rice
11.	Kerala	Rice

Source Dept of food and public distribution <http://fcamin.nic.in/dfpd/EventDetails.asp?EventId=667&Section=policy&ParentID=0&Parent=1&check=0>

Table 8.8 Economic cost and retail prices of market grain, Rs/kg

	2004/05		2009/10	
	Rice	Wheat	Rice	Wheat
Economic cost	13.04	10.19	18.2	14.25
Median price	10.75	9	18	14
Median price of bottom 4 deciles	10	8	15.5	12.08

Source Economic cost is from various issues of economic survey of Government of India (2011a). The retail prices are our calculations from the consumer expenditure survey data of NSSO

8.6 Procurement Reforms: Computerizing the Procurement Network

Procurement has both spatial and temporal dimensions. Grain is purchased at many locations and purchases happen over several months. Grain purchases are aggregated and moved to warehouses from where it is supplied to the public distribution system. An additional complication that occurs with rice is that the grain is procured in the form of paddy. It then leaves the government system to be milled by private rice mills and returns to the government system in the form of rice.

These operations have been computerized in the decentralized procurement operations of state of Chhattisgarh. The state procures 5 million tons of paddy through 1500 primary agricultural cooperatives (PAC). The grain is moved and stored in the warehouses of the Chhattisgarh Civil Supplies Corporation from where it enters the public distribution system.

A computer network and an associated data base links the primary agricultural cooperatives, warehouses and the Food and Civil Supplies department. Procurement data is entered in off-line mode at the procurement centres and is

uploaded to the central server on a daily basis. Motorcycle runners carry the data to the locations with network connectivity.¹²

This kind of electronic information system has several advantages. First, it has enabled speedy payment of procurement dues to farmers. Second, the information system offers real-time information on procurement, grain movement and stocks to decision-makers. As a result, the system is forced to match data on these key variables and diversions will result in discrepancies that show up on the system. Third, the system is also extended to distribution centres and the movement of grain from warehouses to these centres. As a result, it enables automation of allocations and grain movement to the distribution centres. The importance of such automation is described in the next section.

Despite its many advantages, computerization would not be easy in many of the other states. Chhattisgarh extensively used primary agricultural societies/cooperative societies as points of procurement and therefore bypassed the traditional agricultural markets governed by the Agricultural Produce Marketing Committee (APMC) Acts. In states where this is not possible, obtaining the cooperation of APMC (set up under the Act) would be essential.

8.7 Distribution Reforms

As mentioned in the introduction, the distribution of subsidised food happens within the institutional framework of a federal government structure. After the grain reaches designated FCI supply depots within a state, further distribution of grain is the responsibility of the State government. The logistics of grain distribution has a well defined structure. First, there has to be a list of beneficiaries together with their entitlements. Such a list at a particular location would dictate the amount of grain to be allocated to that location for every month. The amount of grain to be supplied to a location is, however, not the same as allocation. Supplies depend on the allocation as well as the stocks already held at the location (amounts not sold from previous supplies). The supply order leads to the movement of grain from the state warehouses to supply depots. In most states, the retailer picks up supplies from these depots. In states with 'door-step delivery' the supplies are delivered at State expense to the fair price shop. Finally, the fair price shop (FPS) retails the grain to the listed beneficiaries according to their entitlements. In sequence, the following are the principal activities of the distribution system.

1. Listing of Beneficiaries: This includes classification of households into Antayodaya Anna Yojana (POP/AAY) households, Below Poverty Line (BPL) households and Above Poverty Line (APL) households.
2. Issue of Ration (Entitlement) Cards to Beneficiaries: This is the principal means of identifying the beneficiary as belonging to any one of the above groups.

¹²For a detailed description see Dhand et al. (n.d.).

3. **Authenticating Transactions:** The FPS retailer is legally bound to sell grain only to the listed beneficiaries and that also according to the entitlements defined for the group to which they belong (APL, BPL and POP/AAY). In many states, the standard practice of authentication is for the beneficiary to show the ration card to the designated FPS retailer. Existing practice ties a beneficiary to a particular FPS. At the time of purchase, the details of purchase are entered in the ration card.
4. **Grain storage, movement and supply to FPS:** The FPS retailer obtains grain from the supply depots (usually managed by state civil supply warehouse corporations). This is a monthly operation and the FPS retailer pays for this in advance. The supplies to the FPS retailer are authorised by a supply officer who takes into account unsold stock from previous supplies and the allotments done on the basis of the number and type of beneficiaries.

Once the beneficiaries are listed and ration cards issued, (3) and (4) are the activities that recur every month. Although distribution has a well defined structure, it has been hard in practice to administer this system efficiently. One of the most well studied aspects of the PDS has been the leakages of grain from the subsidy system. The sizeable difference between the issue price (at which grain is sold to the consumer) and the market price creates incentive for profitable and illegal arbitrage. In government records, the arbitrated grain is recorded as being sold at the issue price and therefore part of the legitimate sales of subsidised grain to households. However, in fact, the sales are fictitious.

In recent years, some states are attempting to address the loss due to illegal diversions by deploying information technology together with some administrative measures. The principal elements of distribution reform have been the following:

Computerising the data base of beneficiaries This is essentially transferring the contents of paper records to a digital domain.

New listing of beneficiaries A fresh listing could be motivated by the need to reduce exclusion and inclusion errors. Governments may wish to include eligible households that either did not exist or were left out during earlier listings. Similarly, governments may wish to exclude households that were either wrongly included in earlier listings or have since become ineligible. The new listings could be done by the inclusion of new data bases (such as BPL lists from various vintages) or by household verification. Verification could consist of door-to-door verification or it could include identification through biometrics. The latter would necessitate a fresh process of enrollment into the program.

Issue of new ration cards A fresh listing of eligible households makes this essential. But even otherwise, these ration cards may be re-issued to incorporate features such as bar-coding and biometric id.

Authentication of transactions by smart cards and/or biometric identification

In existing practice, authentication is typically done at the point of sale. The possession of a ration card is taken to be proof that the holder of the card is a registered

beneficiary. However, the scale of leakages from the PDS in the form of illegal diversions of grain suggest that a fair number of ration cards are issued either to fake customers or that a single person controls a large number of ration cards. One way to resolve this is to require the customer to provide fool-proof identity at the time of accessing the FPS. There are possibly several ways of doing this. One way is through smart cards. Smart cards can be used to authenticate transactions either through numeric code identification (such as in a bank card) or through biometric identification. The latter requires the use of biometric scanners that reads and transmits the information to a central server where it is matched with previously registered biometrics.

Recording of transactions in real time or near-real time through IT systems

Automation of retail transactions leads to real time information on demand and off-take at each retail outlet.

There are two major benefits of distribution reform. First, the authentication of transactions at the retail level eliminates fake and duplicate ration cards. In so far, as illegal diversion is recorded in government books as legitimate sales, such an avenue for diversion is now shut. Among our case study states, this is the major distribution reform attempted in Madhya Pradesh and Gujarat.

Smart card based systems have been used in a pilot project in Chandigarh. In our visits to states, some of the respondents reported that the success of smart-card systems has been mixed. The primary problem is that PDS retailers, whose interests are directly opposed to authentication, are entrusted with the management of smart card devices. As a result, there have been frequent problems with the functioning of smart card readers, many of which are suspected to be engineered. This could be a problem with any device reader (smart card, biometric) at the retail level. The other issue is one of infrastructure. For a reader to authenticate the transaction, it must do so against a data base stored at a central server. Connectivity is therefore essential for this to happen.

An intermediate system that is employed in some states is the use of food coupons. Here consumers obtain food coupons against biometric id which are then redeemed at the FPS. In such a system, connectivity is not required at the FPS level; it is, however, required for the issue of food coupons.

The second major benefit of distribution reform is that the automation of retail transactions leads to real time information on supply gaps at each retail outlet. Then it is possible to connect this information with a back-end module of inventory management that is concerned with stocks and grain movement between different storage depots. Linking retail transactions with an inventory tracking system is essential for automated allocations of grain to retail outlets leading to automated supply and movement of grain. Such a system reduces paperwork and increases the timeliness and predictability of supplies. Among our case study states, this is the major distribution reform that has been undertaken in the state of Chhattisgarh.

Reliable costs for distribution reforms are hard to come by. It depends on the number of beneficiaries. The costs reported by the States may not always fully

account for the costs of in-house resources. The best estimate comes from Madhya Pradesh. Here reforms have covered the activities mentioned in (1) to (3). Moreover, all of these activities have been outsourced to a private consortium for a period of 5 years. It is reasonable to assume that the consortium will recover its costs during this period. The government reimburses the consortium at the rate of Rs. 10.98 (inclusive of taxes) per transaction of each BPL card holder. With a population of 7 million BPL (and AAY/POP) cardholders, this means that total number of transactions (maximum) in a year is 84 million (7×12). Hence over 5 years, the total number of transactions is 420 million. At the agreed reimbursement rate, the maximum cost to the government is Rs. 4611 million or Rs. 461 crores. This is the upper bound on the cost because our calculations assume that all BPL card holders transact PDS grain every month. The private consortium has an additional source of earnings as well—from APL cardholders who directly pay for each transaction (unlike BPL cardholders whose cost is picked up by the MP government).

Table 8.9 Best IT practices in PDS across states

Best practices	States
Creation of centralised beneficiary databases	Chattisgarh, Gujarat, TN
Cleaning up of duplicate beneficiaries through biometrics	AP, MP
Web based application for maintaining ration card data base	Chattisgarh, Gujarat, TN
Issuance of TPDS commodities through bar coded RC	Chattisgarh, Gujarat
Issuance of TPDS commodities thru smart card based ration cards	AP, Chandigarh, Haryana, Orissa (all are in Pilot stage)
Issuance of TPDS commodities thru food coupons	Bihar, Gujarat (Pilot), MP (Under implementation and expected to go live by Jan 2012, Orissa (Pilot)) etc.
Online biometric verification before transaction	Gujarat (Pilot)
Web based automated allocation every month	Chattisgarh, TN, Gujarat
Generation of delivery orders, truck challans, receipts and movement of commodities thru software	Chattisgarh
Automated assessment of transport requirements	Chattisgarh
Use of GPS for truck tracking	TN (Chattisgarh and MP to be confirmed)
PDS related info on website like FPS/RC list, allocation, month-wise lifting and sales etc.	TN, Chattisgarh and MP
SMS alerts to citizens/vigilance committees	Chattisgarh
Grievance redressal system through call centre, websites etc.	Chattisgarh, TN and MP

Source Based on Government of India (2011c), report of task force on an IT strategy for PDS

Across states and at the national level, there is awareness and advocacy about the use of information technology in distribution reforms. As mentioned earlier, responding to the petition about right to food, the Supreme Court of India has issued a number of directives to the government. To derive a factual basis for their orders, the Court has appointed a Central Vigilance Committee chaired by Justice D.P. Wadhwa to “to look into the maladies affecting the proper functioning of the Public Distribution System and also suggest remedial measures.” The Committee has issued a number of reports on the PDS including one on computerisation of PDS operations. In its report of 2009, the Committee recommended “least human intervention and end-to-end automation and computerisation of the complete PDS chain.”

The Expert Committee on the National Food Security Bill (2011) argued that “comprehensive computerisation of the PDS network starting from the allocation of the grain to the final delivery to the targeted beneficiary will go a long way in plugging diversion of grain, bogus ration cards and delivery of poor quality of foodgrains to beneficiaries.”

In 2011, the government of India constituted a task force (chaired by Nandan Nilekani) to work out a system of direct transfers of subsidy for kerosene, LPG and fertilizers. Subsequently, the task force was also mandated to suggest an IT strategy for the PDS. On the ground, several states have already rolled out distribution reforms. Table 8.9 summarizes these efforts.

8.8 Individual State Experiences

This section provides a glimpse of the variety of distribution reforms that are being attempted. A comparative assessment across Chhattisgarh, Gujarat and Madhya Pradesh provides an opportunity to identify the generic issues, and to evaluate the possible strengths and limitations of the reform models on offer. The section also compares the distribution reforms attempted in the states with the ‘direct subsidy transfer’ model favoured by the Central government.

8.8.1 Chhattisgarh

This state has undertaken several kinds of reforms of the PDS.

- (i) Computerisation of the Procurement System: Chhattisgarh is a surplus state in paddy and contributes to the central rice pool of the PDS. The procurement operations in the state are undertaken under the decentralised procurement scheme of the Government of India. The Chhattisgarh computerisation of procurement has been described earlier in Sect. 8.7.

- (ii) Timely management of supplies: The state is not dependent on FCI for supplies. It retains the portion needed for its PDS and the remainder is transported to the FCI godowns. Control over supplies together with a software solution that links state warehouses and procurement centres makes it possible to automate allocation, delivery orders and transport movement. Chhattisgarh offers 'door-step' delivery by which the grain is delivered to FPS unlike the usual model where it is the responsibility of the FPS retailer to pick up the grain from the district supply depot.
- (iii) Issue of bar-coded ration cards based on a computerised data base of ration cards: Unlike some other states that have embraced PDS reforms, Chhattisgarh does not have an IT solution for transaction authentication. Instead, the new data base was prepared on the basis of door to door verification. A smart card solution (without biometrics) is proposed to be deployed in urban areas for authentication.
- (iv) Extended coverage: The Chhattisgarh PDS departs from the Central scheme in two ways. First, it covers more families under the BPL criterion than it is reimbursed by the Central government. About 70 % of the population is covered under BPL or AAY/POP. Second, the rate for rice is Rs. 2 for BPL and Rs. 1 for AAY/POP, both of which are lower than the GoI rates. As a result, the state government incurs a food subsidy expenditure of more than Rs. 1000 crores. Sensitivity to exclusion error and the political commitment to extended coverage is the principal feature of the Chhattisgarh model.
- (v) De-privatisation of FPS: The FPS are run by self-help groups, gram panchayats and cooperatives. The government also increased the commissions sharply (by about 5 times). Supporters of the Chhattisgarh model claim that de-privatization has reduced leakages as the system is run by the people who have a stake in a well functioning PDS. It should be noted that many other states have also experimented with these organizational forms and leakages have continued unabated.
- (vi) Public Awareness: The extended coverage, the low price of rations and well publicised timely supply have served to create a public consciousness about the PDS and their rights to it. This, it has been suggested, has been a check on illegal practices in the PDS. Interestingly, Chhattisgarh has not opted for a technology driven transaction authentication system. A smart card based system is proposed to be introduced in the urban areas.

Supporters of the Chhattisgarh model often claim that (near) universal coverage and de-privatisation of FPS are responsible for the model's success. The implication is that this is a prescription for other states. Such claims need to be evaluated cautiously. It is, no doubt, true that the state government has been sensitive to exclusion errors resulting from targeting regimes. The willingness to spend out of its own resources is a stand-out feature and indicates the extraordinary political will. As a result, the bureaucracy, in relation to other states, is also unusually pro-active in stamping out malpractices. Such political and bureaucratic will cannot be taken for granted elsewhere especially in the face of opposition from interests vested in

the existing PDS. Indeed, even within Chhattisgarh, the model has not functioned with the same degree of success in urban areas.

8.8.2 *Gujarat*

The Gujarat model of reforms encompasses all the four components of distribution reforms sketched out earlier: computerisation of PDS data base, new listing of beneficiaries, issue of new bar-coded ration cards and transaction authentication using biometric id. The project is at a pilot stage: one FPS in each Taluka of 22 districts has been selected for the pilot. The principal activities are the following:

- (i) All households are asked to re-register to obtain bar-coded ration cards. The process digitises family particulars and requires an electoral photo id as proof of identity. Bio-metrics of family members are also recorded.
- (ii) Bar-coded ration cards are issued and distributed.
- (iii) Using these ration cards, the beneficiary visits an E-Kiosk (set up in the gram panchayat offices during the pilot) to obtain food coupons monthly. The computer operator uses a bar code reader device to enter the details of the beneficiary. Bar coded food coupons are issued on verification of biometrics. The latter happens in real time and therefore requires connectivity with a central server.
- (iv) The beneficiary redeems these coupons at the designated FPS.
- (v) The FPS retailer submits these coupons to the E-Kiosk. Again they are read by the scanner and entered into the electronic sales register of that FPS.
- (vi) Against these electronic sales, allotments are made for the succeeding month which is picked up by the FPS from the supply depot. Although the intent is to also have a back-end inventory management system that is linked with the distribution network that has not happened yet. When that happens, the system will be able to track storage, movement and lifting and automatically generate allotments and supplies.

The IT solutions have been deployed in-house in collaboration with NIC. The capital costs are estimated to be modest: at Rs. 800 million or Rs. 80 crores. The recurring costs are about Rs. 250 million or Rs. 25 crores per annum. These have to be seen as costs borne by the State and not total project costs. This is because some major costs such as that of the IT solution are borne by the Government of India through NIC.

The strength of the model is undoubtedly its focus on transaction authentication. In principle, the system ought to make leakages very difficult. However, the worry is that the model may be ahead of its time. Internet connectivity to gram panchayats (required for transaction authentication) is not as good as it is claimed. This causes delays in receipt of coupons—a cost that is doubly onerous because E-kiosks for most beneficiaries are more distant than the FPS. Another weakness of the model is its unconcern for exclusion errors. The requirement of electoral photo ID for the

new ration cards is bound to exclude some of the poor. This is compounded by the difficulties in access to E-kiosks because of distance and poor internet connectivity. These problems could be severe because coupons are issued monthly. Bi-annual or annual issue of coupons would significantly lower the cost of access especially for poor consumers.

8.8.3 *Madhya Pradesh*

In terms of intent and scope, the MP model is similar to Gujarat. However, in terms of design and execution, the models are vastly different. Further, unlike Gujarat which is at the pilot stage, the MP model is at the roll-out stage with its first districts likely to 'go live' in 2012 or 2013.

Like Gujarat, biometric transaction authentication is at the heart of the MP model. The MP model is designed to be compliant with *Aadhar*, the nationwide biometric id project of the Government of India. The Gujarat model is as yet independent of *Aadhar* but may be compliant with it in the future. The MP model is structured as follows:

- (i) *Aadhar* enrollment is a pre-requisite for PDS. Camps have been organized in villages (more than once) for households to offer their particulars and their biometric id. Organisationally, the Food and Civil Supplies Department is the Registrar to *Aadhar* in Madhya Pradesh.
- (ii) Enrollment leads to a computerised data base of PDS beneficiaries and to the issue of new *Aadhar* based ration cards.
- (iii) Food coupons are mailed/couriered annually to the beneficiaries. On receipt, beneficiaries have to verify their biometric identification on a portable device. Internet connectivity for authentication is provided by commercial cell phone networks.
- (iv) The beneficiary redeems the coupons at a designated FPS.
- (v) These coupons are picked up and transported to a scanning centre at the State capital.
- (vi) On verification of coupons, the electronic system generates a report of transactions and sales which can be used for allotments, supplies and movement.

The execution of the model has been handed to a private consortium consisting of HCL, Edenred and Virgo Softech. The government has no upfront costs but pays a service fee of Rs. 10.98 (inclusive of taxes) for each transaction. The model has several strengths worth noting. First, like the Gujarat model, it is also focussed on transaction authentication—the key to stopping illegal diversions. It can also be seen that MP, like Gujarat, has avoided the smart card route because not only is it more demanding of infrastructure (internet connectivity at all retail points) but is also more prone to sabotage by interests opposed to transaction authentication. Second, the State has no upfront costs. All the risks of project implementation are

borne by the consortium. Third, the system aligns the incentives of the vendors with that of the customers. The vendors get paid only if beneficiaries are enrolled and when they transact. Hence it is in their incentive to maximize their efforts towards enrollment and also timely dispatch and processing of food coupons.

The test of the model will be in the field. There are two major points of concern. First, is the process of enrollment leaving out many of the eligible—for e.g., those who have temporarily migrated and those who are too old and infirm to attend village camps? In the same vein, if somebody is left out in the initial process of enrollment, is there an easy enough process for such ‘left-outs’ to subsequently enroll? The strong incentives of the vendors should help in minimizing this concern. The second concern is the reliance of this model on *Aadhar*. For this model to roll out, households must receive *Aadhar* ids on time. However, it does seem that at this moment, the issue of *Aadhar* ids is not able to keep pace with enrollment. As a result, there are some delays in the project.

Finally, unlike Chhattisgarh, the MP model does not embrace procurement and storage even though MP, like Chhattisgarh, is a surplus state (in wheat) and undertakes decentralised procurement in wheat. The gains in efficiency can be far greater if the procurement operation is automated and linked to the distribution network.

The Task Force on Direct Transfers (Government of India 2011b) has championed the direct subsidy transfer model. Here the grain (or more generally the subsidised commodity) would flow through the government marketing chain at market prices so that there is no incentive for diverting grain to the market. The consumer buys grain from the authorised retailer at market prices and the retail transaction is subject to *Aadhar* ID verification. The retail transaction is also linked to a payments system. When the transaction is authenticated and completed, the payments system transfers the monetary value of the subsidy to the beneficiary’s bank account.

The direct subsidy transfer model is different from the coupon model that is being constructed in Gujarat and Madhya Pradesh. The direct subsidy transfer model has the advantage that it requires only one transaction at the retail level while a coupon model requires the consumer to first receive coupons before the retail transaction. However, the direct subsidy model requires connected devices to capture biometric id and transactions at the retail level while the coupon model needs scanners and connectivity only when the coupons are issued. The coupon model is less demanding of infrastructure.

8.9 Conclusions

The PDS has gained salience because of the proposed National Food Security Act which will enlarge the PDS financially and logistically. However, there are major concerns with the PDS: the seeming shortage of storage capacity, the ‘excess costs’ of the FCI, the exclusion errors that deprive the poor, the poor efficiency in

transferring subsidies to households, the illegal diversions that happen because of dual pricing, and the fact that it is customer unfriendly. All of this has been documented by researchers for several years.

In recent years, however, there has been greater attention in policy and execution on what reforms could move the PDS towards greater effectiveness. No official document on PDS today would be complete without reference to the necessity of PDS reforms. As the implementation of PDS is the responsibility of the States, reforms have to happen at that level.

The aim of this study was to sense and assess the movement on reforms: in policy as well as on the ground. The presumption was that the failures with existing mechanisms are so widely experienced that various states have on their own have devised alternative mechanisms and frameworks. Accordingly, the source materials for our study were government documents (for policy), interviews with key officials, public sector managers, interviews with private players in logistics, IT and food coupons.

We considered both procurement and PDS reforms. If the food security bill is legislated, the PDS will be considerably enhanced in volume. This will put additional pressure in turn on procurement and storage. Hence, reforms in procurement and storage have an immediate bearing on the functioning and cost of the PDS. Some of the misgivings about the food security bill actually arise from the pressure it would put on procurement and storage (Economic Advisory Council 2011). It has been argued by others (Kotwal et al. 2011) that meeting the challenges posed by an enhanced PDS would require not just reforms in procurement but also specific kinds of PDS reforms such as cash transfers.

This study confirms that India and FCI are short of storage capacity. By our calculations, peak storage demand ought to be 46 million tons while FCI currently commands about 32 million tons of capacity. While 14 million tons is still a major shortfall and capacity needs to expand by nearly 50 %, the calculations are not as dire as would be suggested by methods that consider peak procurement in recent periods.

However, our peak demand calculations assume procurement to be in line with distribution. If this does not happen, as has been past experience, it is not clear how capacity can ever match stocks in a world of open-ended procurement. If capacity were to be in line with past peak procurement, storage crises (insufficient as well as excess storage) will recur cyclically. It is, no doubt, a formidable political task to scale down procurement to match distribution (not necessarily on an annual basis but over a crop cycle of five years or so). Yet, as we pointed out, it should be possible to devise new institutional structures to make 'excess stocks' visible so that there is at least greater awareness of the consequences of open-ended procurement.

Distribution reforms have enormous potential since most states are starting at a high level of inefficiency. The necessity for these reforms is shared across the board: at the Centre and at the States. However, the entrenched interests in the PDS are strong and political commitment in the States towards reform cannot be taken for granted even if it allows reforms to be initiated.

Distribution reforms promise to bring accountability and transparency in the PDS by, digitizing records, by web information on stocks and allotment and by transaction authentication. Computerising the supply chain and digitizing records are immediately feasible in all states. Transaction authentication is more demanding but has high payoffs. Smart card based systems are better suited to urban areas with good internet connectivity but cannot function in areas with poor connectivity. They are also more prone to sabotage. Food coupon systems based on biometric identification are more practical. However, they require to be designed with care. In particular, it should not impose additional costs of access on poor consumers.

Chhattisgarh, Gujarat and Madhya Pradesh are following different models of subsidy reforms. The Chhattisgarh model is the most comprehensive. The state contributes its own resources to offer near-universal subsidies. This is backed by a real-time electronic information and decision system connecting procurement, stocks and allocations to distribution centres. The only component missing is transaction authentication at the retail level. The proponents of the Chhattisgarh model, however, believe that this is best accomplished by community oversight. The political and bureaucratic commitment to the program is the stand-out feature of the Chhattisgarh reform process. This is also a weakness: that it requires continuous surveillance.

The computerised stock management system seen in Chhattisgarh is not prominent in either Gujarat or Madhya Pradesh. Biometric transaction authentication is the key reform pursued in both these states. The technology choices made by the Gujarat model seems demanding of the connectivity infrastructure. The issue of monthly coupons increases the cost of access by households. On both these points, the Madhya Pradesh model is reassuring: coupons are issued annually and connectivity is provided by normal cell phone networks. Moreover, as the operators of the model are paid according to service levels, their interests are aligned with households. Taken together, the three states are impressive examples of bottom-up reforms.

The variation in reforms between states and the departures from the Central government's models of subsidy transfers will allow learning. It is important that future policies and legislation be designed to allow experimentation with different models.

The social gains of effective distribution reforms are large and therefore worthy of government support. However, the direct gains of these reforms do not accrue to those who bear the costs of reforms. For most states, the amount spent on food subsidy from own-resources is negligible. Therefore, they are not direct gainers from distribution reforms. On the other hand, it is the Central government that is the major financial beneficiary. Therefore, this calls for Central policies that incentivise distribution reforms in states through cost-sharing and other means.

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