Working Paper 294

Leakages from Public Distribution System (PDS) and the Way Forward

Ashok Gulati

Shweta Saini

January 2015

INDIAN COUNCIL FOR RESEARCH ON INTERNATIONAL ECONOMIC RELATIONS

Table of Contents

Table and Figures

Abbreviations

AAY	Annatodya Anna Yojana Program (Poorest of the Poor)
APL	Above Poverty Line
BPL	Below Poverty Line
CACP	Commission for Agriculture Costs and Prices
CCTs	Conditional Cash Transfers
CFSA	Chhattisgarh Food Security Act, 2012
CIP	Central Issue Price
DFPD	Department of Food and Public Distribution
FCI	Food Corporation of India
FPS	Fair price shops
GDP	Gross Domestic Product
HP	Himachal Pradesh
J&K	Jammu and Kashmir
MMTs	million metric tonnes
MP	Madhya Pradesh
MPC	Monthly per capita
MSP	Minimum support price
NFSA	National Food Security Act, 2013
NFSB	National Food Security Bill
NMMT	Nagaland, Manipur Mizoram, and Tripura
NREGS	National Rural Employment Guarantee Scheme
NSSO	National Sample Survey Organization
OWS	Other Welfare Schemes
PDS	Public Distribution System
SSP	Social Security Pensions
TN	Tamil Nadu
TPDS	Targeted Public Distribution System
UID	Unique Identification Authority
UP	Uttar Pradesh
UT	Union Territory
VGB	Village Grain Bank
WB	West Bengal
WBNP	Wheat Based Nutrition Program

Acknowledgment

The research leading to this publication is part of an ongoing ICRIER-ZEF research project titled "Stabilizing food prices through buffer stocking and trade policies".

The authors wish to thank Prof. Shashanka Bhide, *Director*, Madras Institute of Development Studies (MIDS), Tamil Nadu and Prof. N. Chandrasekhara Rao, *Professor*, The Institute of Economic Growth (IEG) for reviewing the paper and giving valuable suggestions. The authors would also like to thank the senior IAS officers, for the useful discussions on this subject during the 2014 Phase V Training Program, LBSNAA, Mussorrie.

Abstract

The public distribution system (PDS) has been one of the main policy instruments of the Government of India (GoI) to provide food security to the people of this country, especially the vulnerable ones. The recently enacted National Food Security Act (NFSA), 2013, also relies heavily on it to deliver even more grain at highly subsidized prices to 67 percent of population. But the existing PDS system has been highly "leaky", with large amounts of grains (40 to 50 percent) being pilfered and diverted to open market. Also, the existing PDS delivers better in better-off states rather than in those where there is concentration of poor, raising issues of equity. Further, the food subsidy bill is ballooning, with Rs 1.15 lakh crores budgeted for FY 2015 plus (unbudgeted) arrears of more than Rs 50,000 crores. The big challenge, therefore, is how to ensure that large sums of money being spent by GoI on PDS deliver food security more efficiently, with much lesser leakages and in a more cost effective manner. In an effort to highlight the inefficiency and iniquitous nature of the existing PDS, the present paper estimates the proportion of grain that was diverted/leaked from the PDS grain-chain in 2011-12. This is done by mapping the difference between the grains off-taken by states from the Central pool and the grain consumed by the PDS beneficiaries. It also studies how tuned is the PDS welfare delivery system to the country's poor.

The paper finds that at an all-India level, 46.7 per cent or 25.9 MMTs of the off-taken grain did not reach the intended PDS beneficiaries in 2011-12. The percent share of total leakage increased with states where greater percent of India's poor resided (five states: UP, Bihar, MP, Maharashtra and West Bengal, which are home to close to 60% of India's poor accounted for close to 50% of the total grain leakage in the country in the year 2011-12).

While some experts (Himanshu and Sen, 2011) pitch for near universal PDS to plug leakages, and NFSA argues for end to end computerization and setting up of vigilance committees and courts, this paper makes a case for shifting the support to poor from highly subsidized price policy to income policy of cash transfers through Jan-Dhan yojana dovetailing UID of Aadhaar scheme. We also argue that this is the best global practice, can plug leakages, reach the vulnerable segments of population, not interfere with markets of food, and save more than Rs. 30,000 crores annually to the government of India under the most likely scenario, while still giving a better deal to consumers. The saved resources can be ploughed back as investments in water (irrigation), rural roads and agri-R&D that could deliver food security, directly or indirectly (through increased incomes), to people of this country in a more sustainable manner.

JEL Classification: *I38, H42, Q18.*
Key Words: *PDS, food security, agriculture, India, leakages, cash transfer.*

Author's Email: *agulati@icrier.res.in ; ssaini@icrier.res.in*

Leakages from Public Distribution System (PDS) and the Way Forward

Ashok Gulati and Shweta Saini*

I. Backdrop:

The Public Distribution System (PDS) for grains is one of the main vehicles through which Government of India (GoI) delivers 'food security' to people of this country, especially the economically vulnerable ones. This PDS not only aims to make sure that grains are available in sufficient quantities at all times even in the remotest regions but also that these are delivered to targeted beneficiary households at highly subsidized prices, thus making sure that they have 'economic access' to basic staples for a reasonably healthy life.

Operationally, this is done through a massive paraphernalia of procurement operations done through Food Corporation of India (FCI) or its designated state agencies; storing and moving that grain from surplus regions to deficit ones in a timely manner with critical help of railways and other truck transporters; and then finally distributing those grains to beneficiary households through a network of roughly 500,000 fair price shops (FPS) all over the country. This must be the largest public network of its type in the world currently distributing roughly 50-55 MMT of grains annually through FPSs. The National Food Security Act (NFSA), 2013 also relies on this vehicle to deliver food security to 67 percent of population (75 percent rural and 50 percent urban) with an estimated distribution of about 61.4 MMT of grains, mainly rice and wheat.

Financially, PDS costs the GoI quite a bit. Since the grain distributed to beneficiary households is given at prices much below the cost, the difference is reflected in terms of food subsidy in the budget. The current budget for FY 2015 has provisioned roughly Rs 1.15 lakh crores as food subsidy. But the Department of Food and Public Distribution (DFPD) also estimates that there are pending dues (arrears from earlier years) of more than Rs 50,000 crores that need to be cleared on account of food subsidy. The internal calculations of DFPD suggest that full implementation of NFSA will cost at least Rs 1.31 lakh crores annually, which amounts to roughly one percent of current GDP at market prices.

One particular thing needs to be noted in the context of the PDS and its key objectives. The design of this policy is such that it wants to distribute grains at highly subsidized prices to the identified beneficiaries to give them 'economic access' to basic food. The current central issue prices for

* Ashok Gulati is Infosys Chair Professor for Agriculture and Shweta Saini is a Consultant at Indian Council for Research on International Economic Relations (ICRIER), Email: *Ashok Gulati: agulati115@gmail.com;* agulati@icrier.res.in and Shweta Saini: *shwetasaini22@gmail.com; ssaini@icrier.res.in*

wheat and rice are as follows: Antyodaya households: Rs 2/3/kg for wheat/rice; BPL households: Rs 4.15/5.65/kg for wheat/rice; and APL households: Rs. 6.1/7.95/kg for wheat/rice. Under the new NFSA, these rates are going to be Rs. 2/3/kg for wheat/rice for all households (Antyodaya as well as priority households). Contrast these CIPs with the cost of operating the PDS (from procurement to stocking to distribution) which currently is Rs 22/kg for wheat and Rs 30/kg for rice (economic cost including the cost of carrying the buffer). This wide difference between the cost and central issue price (almost 90 percent) gets passed to the end consumers as food subsidy. Given the huge difference between the CIPs and the market prices and the fact that grains have to pass through multiple agencies, there is a high incentive for various intermediaries in the grain-chain to pilfer and divert that to open market, making large gains in the process. Of course a lot depends upon the governance of the whole supply chain under the PDS, especially in the last mile delivery through half a million FPS. But on *a priori* basis, given the very design of policy, there is reason to believe that it would encourage pilferage, which is likely to be higher if the likely gains to be made are large and governance structures weak.

II. Review of some previous studies with regard to PDS Leakages

Several experts have periodically estimated diversion of grains from TPDS. A study by the Programme Evaluation Organization (PEO, 2005)[1] of the Planning Commission is quite relevant in this regard. The study undertook a survey to evaluate the performance of TPDS and defined diversion/leakage as the excess of grains off-taken from the government granaries over what was consumed by the BPL families. Based on the survey results, the report came up with a conclusion that 58 per cent of the subsidized food grains issued from the Central Pool did not reach the intended beneficiaries (BPL families). It also concluded that to deliver Re 1 of an income transfer to a BPL family, government had to spend Rs3.65.

Another study by Khera (2011)[2] estimated proportion of grain diverted from TPDS during the years 1999-2000 and 2007-08. It defined diversion as grains off-taken by the states but not delivered to the PDS beneficiaries. It found that while only 24 per cent grain leaked in 1999, by 2004-05 the leakage had more than doubled to 54 per cent. Khera (2011) also cites the results of another study done by the Institute for Human Development Studies (IHDS) using a somewhat different data set, but coming to a conclusion that in 2004-05, almost 50 percent of grains leaked away from PDS. For the years, 2006-07 and 2007-08, based on thin samples of NSSO, Khera (2011) estimated that these leakages (diversions from PDS) had come down to 46.7 percent and

[1] Planning Commission (2005). Performance Evaluation of the Targeted Public Distribution System (TPDS), Programme Evaluation Organization (PEO), Planning Commission, Government of India

[2] Khera, R, (2011). Trends in diversion of PDS grain. Economic and Political Weekly, 46(21), 106-114

43.9 percent, respectively. Employing similar definition of leakage, Himanshu and Sen[3] (2011) estimated that the leakage from PDS was 54.8 percent in 2004-05 and it reduced to 42.8 percent in 2007-08. More recently, a CACP paper[4] (2012) estimated the leakage for the year 2009-10 to be 40.4 per cent. Just before the Independent Evaluation Office (IEO) was wound up by the new Government in 2014, IEO was evaluating the performance of PDS. Its preliminary finding as reported by its Director General was that approximately 40 per cent of the food grain allocated under PDS did not reach the intended beneficiaries.

So, while the PEO report defined leakage as the excess of grain off-taken by the state over the amount off-taken by the BPL households, all other studies (Himanshu and Sen (2011); Khera (2011) and CACP (2012)) defined leakages more broadly, as the excess of grains supplied over what is consumed from the PDS by the state populations.

III. Estimating Leakages from PDS (2011-12):

In the absence of a survey like the one used under the PEO report, we estimate grain leakages in the system for the year 2011-12 by refining the methodology used by the latter three studies. Broadly speaking, we use the TPDS consumption numbers from the NSSO 2011-12[5] Household Consumption Survey and the TPDS off-take figures from the Department of Food and Public Distributions' monthly document, *Food Bulletin*- to estimate leakages in the system. NSSO gives the information on consumption patterns of households, both in rural and urban India. It gives how much is total cereal consumption, and how much of that is received from the PDS and how much from the open market. By aggregating the rural and urban PDS consumption numbers, we get a state number and upon comparing it with the amount of PDS off-take in the year, the degree of 'pilferage' or 'diversion' in the PDS is estimated. The methodology, however, has been refined and is elaborated in the section below.

This methodology may not be 100 percent foolproof as it may have some 'reporting errors', but given the large size of the sample, these are likely to be small, at least at all India level. As one moves from all India to state levels, and separately for wheat and rice, these reporting errors may get somewhat magnified. In any case, there is no other way to find out how much exactly is the pilferage, and ground level information does suggest quite a sizeable pilferage. So, this exercise would give us some degree of confidence to see roughly how large are the leakages, and how are they spread out across various regions and states.

[3] Himanshu and Sen, A. (2011): "Why Not a Universal Food Security Legislation", Economic & Political Weekly, 46(12), 38-47

[4] Gulati, A., Gujral, J., & Nandakumar, T. (2012). National Food Security Bill Challenges and Options. Discussion Paper No. 2. Commission for Agricultural Costs and Prices (CACP), GoI, New Delhi

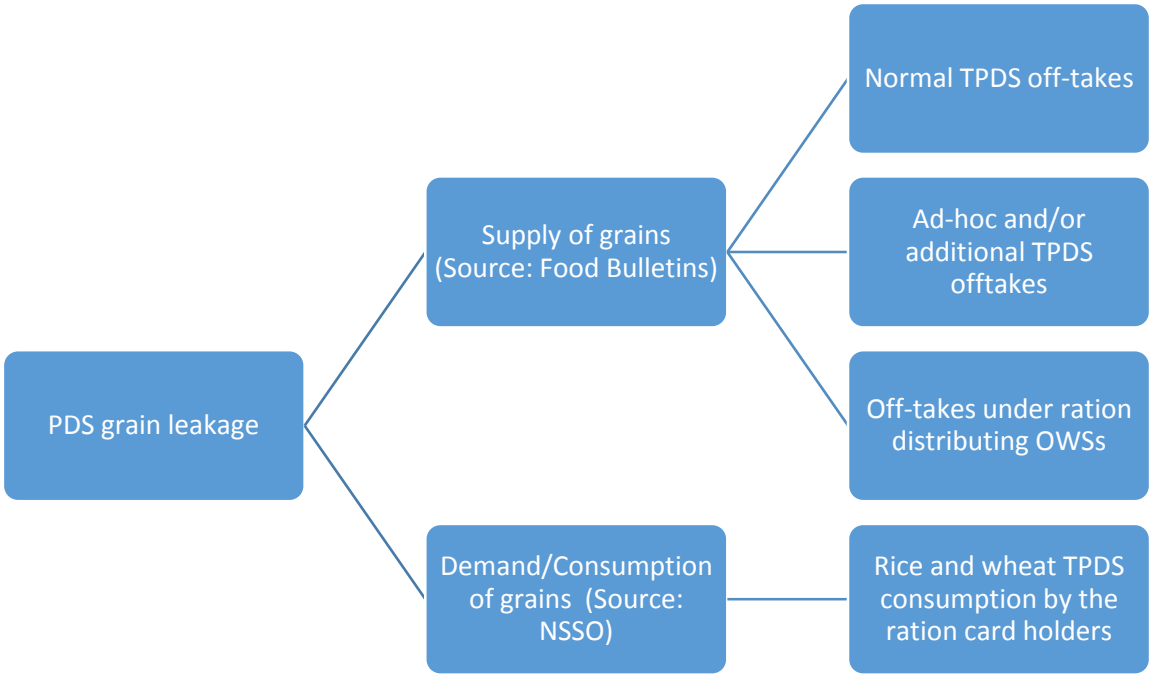
[5] NSSO (2014). Household Consumption of Various Goods and Services in India 2011-12. Report No. 558 (68/1.0/2)

First some clarity about the methodology followed in estimating this leakage or pilferage, whatever the way one likes to term it.

Methodology

As indicated earlier, 'leakage' or 'pilferage' is defined as the difference between the supply of grains (off-take) that is supplied by the Central agencies, namely FCI, to the states and Union Territories (states/UTs) and actual demand (consumption from PDS) as reported by households through NSSO (68th round). So, a precise idea of this can be had by estimating accurately how much has been the off-take of grains by states/UTs from central agencies on one hand, and how much households received from PDS system as per NSSO consumption survey on the other. (Figure 1) This is what is attempted below for 2011-12 data, which is the latest information on the consumption side available in the country. (Annexure 1 elaborates on the methodology and presents detailed calculations)

Figure 1 Framework of the methodology followed in calculating PDS grain leakages



Two points need a special mention here.

First- any literature on the PDS leakage warrants the study of both- the exclusion errors (where based on consumer expenditure levels, actual BPL families are issued APL cards and sometimes are devoid of any cards, thus excluding them from getting the benefits under the system) and the inclusion errors (where based on expenditure levels, people who should have been categorised as APL are issued BPL cards). However, in the paper, we limit the estimation of grain leakage to the

more macro-level. We estimate the total level of grain that was off-taken by the state but that did not get reflected in the consumption of intended beneficiaries (which include AAY, BPL and APL card holders). To understand how much of the total grain was received by the BPL families, who were actually APL and how many BPL families were excluded from the system will demand an extension of the existing analysis by looking at the state-wise MPCE data for different income deciles. We limit the scope of the present paper to estimating the total quantum of grain leakage from the system.

Second is the inclusion of handling and/or transit losses caused to grains, between the off-take and delivery stages. In the absence of concrete data on these losses, the leakage numbers calculated in the paper will include any such losses caused at the state-level.

We now proceed with the methodology outlined above.

Estimating the supply side: Off-take by states/UTs from central agencies

Rice and wheat are supplied by the Central government to the various states/UTs to meet the subsidized grain distribution commitments under the various food based welfare schemes like TPDS, other welfare schemes (OWSs) etc. Due to the level of grain commitment and the depth of coverage of populations, TPDS absorbs the highest percent of the total annual off-taken grain. In 2013-14, of the total 59.8 MMTs of grains off-taken from the central pool, more than 78 per cent was to meet the TPDS needs alone. So, in a year a state typically gets grains from the Centre, to meet the food grain distribution commitments under TPDS and OWSs.

Apart from the "normal" TPDS allocation of grains, the Centre also issues ad-hoc and additional grains to states/UTs. So, a state that covers a greater percentage of its population and/or offers a greater entitlement to its cardholders, or is faced by a natural calamity or just has an excessive seasonal demand, requests for additional grain through the ad-hoc or the additional grain allocation route. The price at which these additional grain needs are met by the Centre may vary depending on the need.

Apart from these TPDS allocations, the states also get grain allocations under OWSs. The Centre runs seven *other welfare schemes* (OWSs) at present. (Village grain bank (VGB) scheme that was functional in 2011-12, is discontinued at present.) Of these seven (eight for the year 2011-12), only five- SABLA, VGB, SC/ST Hostel, Annapurna and WBNP- are understood to distribute raw rations (Annexure 2 gives a brief on the schemes) through the FPSs or the anganwadis. The grain is provided by the Centre. Given that the NSSO-PDS consumption figures are understood to include all the subsidized grain consumption, we thus felt the need to adjust the supply side-number to include the off-take of grains under these five schemes too. (Annexure 2 gives brief of the four OWSs)

After adding the three components, namely TPDS normal off-takes, TPDS ad-hoc/additional off-takes and the off-take under the 5 OWSs- we arrive at the total quantum of grains off-taken by each of the 36 Indian States/UTs in the year 2011-12. (Annexure 3) The data source for this was the Foodgrain Bulletin from the Department of Food and Public Distribution (DFPD).

After calculating the total off-taken grains by each state, one has to get the consumption numbers from PDS so that one can compare the two to arrive at the quantum of grain leakages.

Calculating the annual state-wise consumption of rice and wheat from PDS

NSSO Report[6] gives the state-wise monthly per capita (MPC) quantity consumed (kgs) of rice and wheat from PDS - for rural and urban, separately. Using the Census 2011 numbers for the percent of rural and urban population in each state, a combined state figure of monthly per capita rice and wheat quantity consumed from PDS is calculated. (Annexure 3) The monthly per capita number is then converted into annual figures for each state. (Annexure 4)

As the TPDS is supposed to benefit only a select section of the population of the state, so to convert this per capita number into a total state number, one needs the total number of ration-cards in each state. By multiplying the per capita number with the total number of ration-card beneficiaries[7], one gets the total quantum of rice and wheat consumed under the various food-based welfare schemes in each state/UT. (Annexure 5)

Now, there are states like Chhattisgarh, Andhra Pradesh, Tamil Nadu, Kerala- where the number of ration card beneficiaries is estimated to be greater than the state population, which implies that by following the above mentioned method of evaluating total consumption of the state, we are over-estimating their PDS consumption. Consequently this means that the figures for grain leakages estimated in the next section will really be under-estimating the actual leakage.

Estimating Leakages

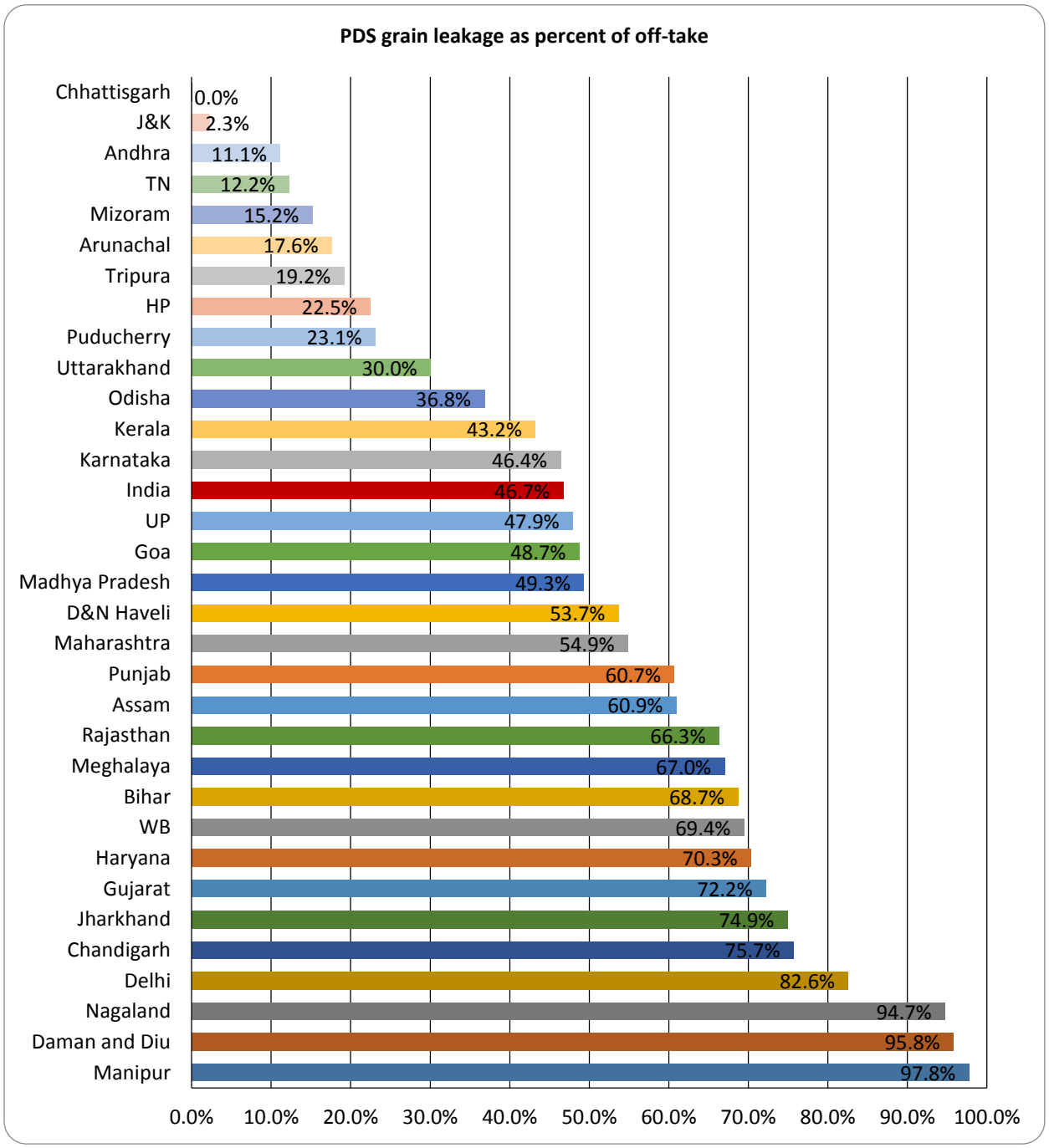
The grains off-taken by each state gives the total grain supply in the year and the consumption figures give how much is received by the targeted consumer. The excess of what is supplied over what is consumed should reflect the extent of leakage of grain from the system. Our calculations show that in 2011-12, 25.9 MMTs or 46.7 per cent of the off-taken grain leaked from the PDS. More than 50 per cent grain off-taken by the state/UT did not reflect in the consumption figures of more than 15 States, some of these states are: Delhi (82.6 per cent), Gujarat (72.2 per cent), Haryana (70.3 per cent), West Bengal (69.4 per cent), Bihar (68.7 per cent) Punjab (60.7 per cent).

[6] NSSO (2014). Household Consumption of Various Goods and Services in India 2011-12. Report No. 558 (68/1.0/2)

[7] We multiplied the number of ration cards in each state (Source: Food Bulletins) with the average household size (Source: Census 2011), to get the total number of ration card beneficiaries in the state.

Some north-eastern states like Nagaland and Manipur show leakages even up to 95-97 percent, but the absolute quantities are low. Figure 2 (based on estimates given in Table 1) shows these states/UTs in ascending order of percentage of off-taken grains that leaked from PDS.

Figure 2: State/UTs wise Percentage Leakages of grains from PDS (2011-12)

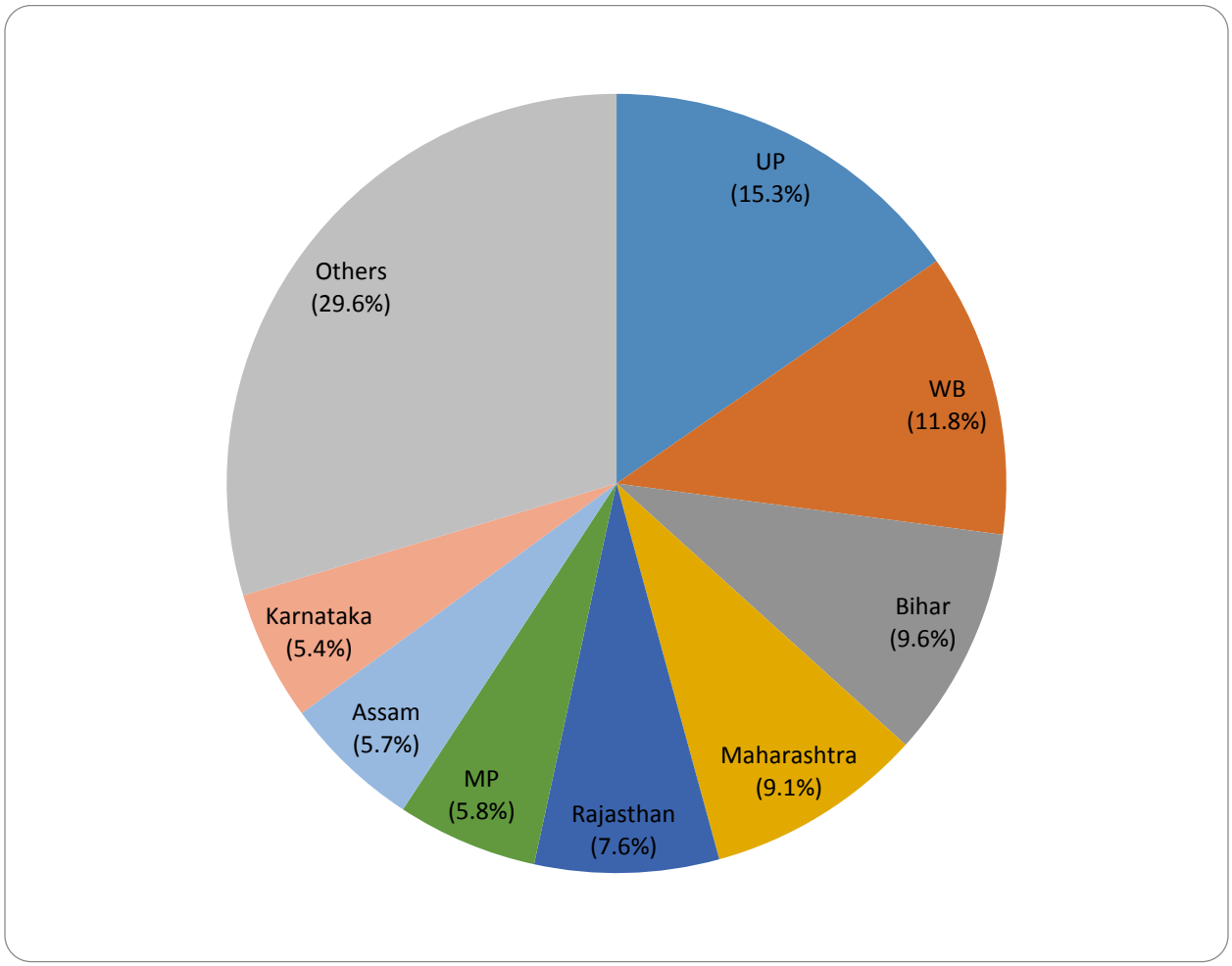


Source: Authors' caculation based on data from Food Bulletin and NSSO (68th round)

However, in terms of absolute quantity of grains pilfered, of the total quantity of 25.91 MMT pilfered, UP stands at the top with almost 4 MMT (15.3%) pilfered from PDS in 2011-12, followed by West Bengal (3 MMT; 11.8%), Bihar (2.5 MMT; 9.6%), Maharashtra (2.34 MMT; 9.1%), Rajasthan (2 MMT; 7.6%), Madhya Pradesh (1.51MMT; 5.8%), Assam (1.49MMT; 5.7%) and Karnataka (1.4MMT; 5.4%). These eight states together pilfered more than 70 percent of total grains pilfered from PDS. This is where the biggest holes are in PDS, and unless they are plugged, there is not much sense in pouring more grains in PDS. Figure 3 gives the relative share of leakages in selected states that account for more than 70 percent of the total leakages in the country (details are also given in Table 1)

Figure 3: Relative shares (%) in Leakages for selected states (2011-12)

(Total Leakage: 25.9MMT)



Source: Authors' caculation based on data from Food Bulletin and NSSO (68th round)

Table 1: Estimating leakages from PDS

	Total Consumption of Rice and wheat from PDS (based on NSSO, 68th round) (MMTs)	Off-take 2011/12 (MMTs)	Leakage (MMTs)	Leakage (%)
	1	2	3=2-1	4=3/2
Andhra	3.61	4.07	0.45	11.1%
Arunachal	0.08	0.10	0.02	17.6%
Assam	0.95	2.44	1.49	60.9%
Bihar	1.13	3.62	2.49	68.7%
Chandigarh	0.01	0.05	0.04	75.7%
Chhattisgarh	1.67	1.67	0.00	0.0%
D&N Haveli	0.01	0.01	0.01	53.7%
Daman and Diu	0.00	0.01	0.01	95.8%
Delhi	0.10	0.60	0.49	82.6%
Goa	0.04	0.08	0.04	48.7%
Gujarat	0.44	1.57	1.14	72.2%
Haryana	0.22	0.73	0.52	70.3%
HP	0.49	0.63	0.14	22.5%
J&K	0.88	0.91	0.02	2.3%
Jharkhand	0.31	1.24	0.93	74.9%
Karnataka	1.62	3.01	1.40	46.4%
Kerala	1.14	2.01	0.87	43.2%
Madhya Pradesh	1.55	3.07	1.51	49.3%
Maharashtra	1.93	4.27	2.34	54.9%
Manipur	0.00	0.20	0.20	97.8%
Meghalaya	0.08	0.25	0.17	67.0%
Mizoram	0.09	0.11	0.02	15.2%
Nagaland	0.01	0.20	0.19	94.7%
Odisha	1.54	2.44	0.90	36.8%
Puducherry	0.05	0.07	0.02	23.1%
Punjab	0.34	0.87	0.53	60.7%
Rajasthan	1.01	2.98	1.98	66.3%
TN	3.95	4.50	0.55	12.2%
Tripura	0.27	0.33	0.06	19.2%
UP	4.32	8.29	3.97	47.9%
Uttarakhand	0.46	0.66	0.20	30.0%
WB	1.34	4.39	3.05	69.4%
India	29.55	55.45	25.91	46.7%

Following a similar methodology for estimating PDS grain leakage, we estimated grain leakage for the year 2009-10. Annexure 6 brings together a summary of the estimated leakages for seven studied years (namely 1999-2000, 2001-02, 2004-05, 2006-07, 2007-08, 2009-10 and 2011-12). The table is a snap shot of the estimated leakages by the present paper, Khera (2011) and Himanshu and Sen (2011). For the interested readers, the table gives an inter-temporal study of changes in the leakages in the Indian states.

A decile-wise study of the MPCE of various states will help unearth the exclusion and the inclusion errors in the system. However, we limit the scope of the present study to estimating the overall leakage and submit that under the present scheme of things (where of the total ration card beneficiaries, 54 per cent are APL, 10 per cent are AAY and remaining 36 per cent are BPL), close to 47 per cent grains off-taken by states, leaked from the system. The leakage includes handling and/or transit losses in the delivery chain, caused at the state-level[8].

Caution has to be used in interpreting the figures of grain leakages for states like Chhattisgarh, Tamil Nadu and Andhra Pradesh- who have extended the existing food based welfare schemes as run by the Centre. These states have a greater percent coverage of their populations, (Chhattisgarh covers 90% of its population while Tamil Nadu covers close to 100% of its populations) and have greater per card entitlement relative to the centre-run scheme. Some of these states, especially Chhattisgarh and Andhra Pradesh, are net food surplus and they maintain their own stock levels to feed their respective extended schemes. An average consumer in such states would be getting subsidized grains not only under the Centre-run schemes but also under the state-specific schemes, including extensions of the former. Therefore, while the consumption figures from the NSSO for these states will be reflecting the total consumption, the supply side figures (as calculated in the paper) only reflect what has been supplied by the Centre. Reliable data on the level of grains distributed (over and above the Centre-run schemes) by these states is not available. Therefore, estimates of zero or near-zero leakage in the states like Chhattisgarh, should be read with caution. They do not necessarily imply better-than-normal efficiency of the respective PDSs. It may be attributed to a possible under-estimation of their supply side and thus under-reported leakages. To cite a specific example in this context, it may be worth dissecting the case of Chhattisgarh a little bit more.

In her study, Khera (2011) also takes up the case of Chhattisgarh as the state showed leakage rate of minus (-) 1.5 percent for 2007-08. She digs deeper, and collects the data from the state, which was 'top up' by the state on top of the supplies from the Central pool. Once this information was added on the supply side, she found that the leakage rate in Chhattisgarh shot up from -1.5 percent to 37.7 percent, which was quite close to the all India average figure of 43.9 percent for the year

[8] There are also instances reported where the PDS grains get leaked between state borders, however, due to the non-availability of such data, we cannot quantify such leakages.

2007-08. The author rightly advises that similar studies must be undertaken for at least Tamil Nadu and Andhra Pradesh, which run expanded PDS, before coming to any conclusion regarding their low diversion rates.

But the information on this 'top up' supplies by some of these states is not easily accessible. In Chhattisgarh, what we know is that the present PDS rules are such that it gives 35 kgs of grains on per household (HH) basis. This incentivizes individuals to hold separate ration cards so as to get a family entitlement of 35 kgs per month. Chhattisgarh is the only state that passed a food security act called the Chhattisgarh food security act (CFSA) a year before the NFSA was enacted at the national level. The CFSA has a greater coverage (90 per cent) of the state's population than NFSA (78.6 per cent); the CIP for AAY and BPL families is Re. 1/kg for both rice and wheat as compared to NFSA's CIP of Rs.3/Rs.2 per kg for rice and wheat, respectively; and finally, unlike the NFSA- the entitlement for AAY and BPL is on a per card basis and not on a per person basis. This has led to a peculiar situation in the state where each person, who is 18 years and above, has an incentive to get a separate card so as to benefit from the monthly entitlement of 35 kgs each. The result is that today, there are 3.1[9] crore ration card beneficiaries in the state where its total population is only 2.6 crore! As a result, within last three years since 2011-12, Chhattisgarh's food subsidy expenses have increased more than six times, i.e. from Rs. 717 crores in 2011-12 to Rs. 4600 crores in 2014-15 (Source: Department of Food, Chhattisgarh). In wake of this dramatic food subsidy increase, according to recent news[10], Chhattisgarh government is already thinking on revisiting the CFSA caveats. There is particular emphasis on replacing the existing system of per card entitlement, which is encouraging splitting of families for getting higher amounts of food grain entitlements, with a per person entitlement. This move, as per the news report, will cut the grain requirement by 25-30 per cent from the present levels.[11]

IV: Does PDS help poorer states?

It would be interesting to see how far India's TPDS is tuned to help abolish poverty. A crude way to examine this is to see where the off-takes of subsidized food are large, leakages low, and poverty high. If that is the case, one can say it is serving a good purpose. We proceed by looking first at the state-wise poverty ratios in the country (Figure 4), which will give us the percentage of poor population vis-a-vis the total population of the state (Source: Planning Commission[12]). Later to

[9] There are 69.1 lakh ration cards issued in the state, as on June 2014, and multiplying it with the average HH size of 4.54 (Source: Census 2011), the total number of people with ration cards become 313.7 lakh or about 3.1 crore.

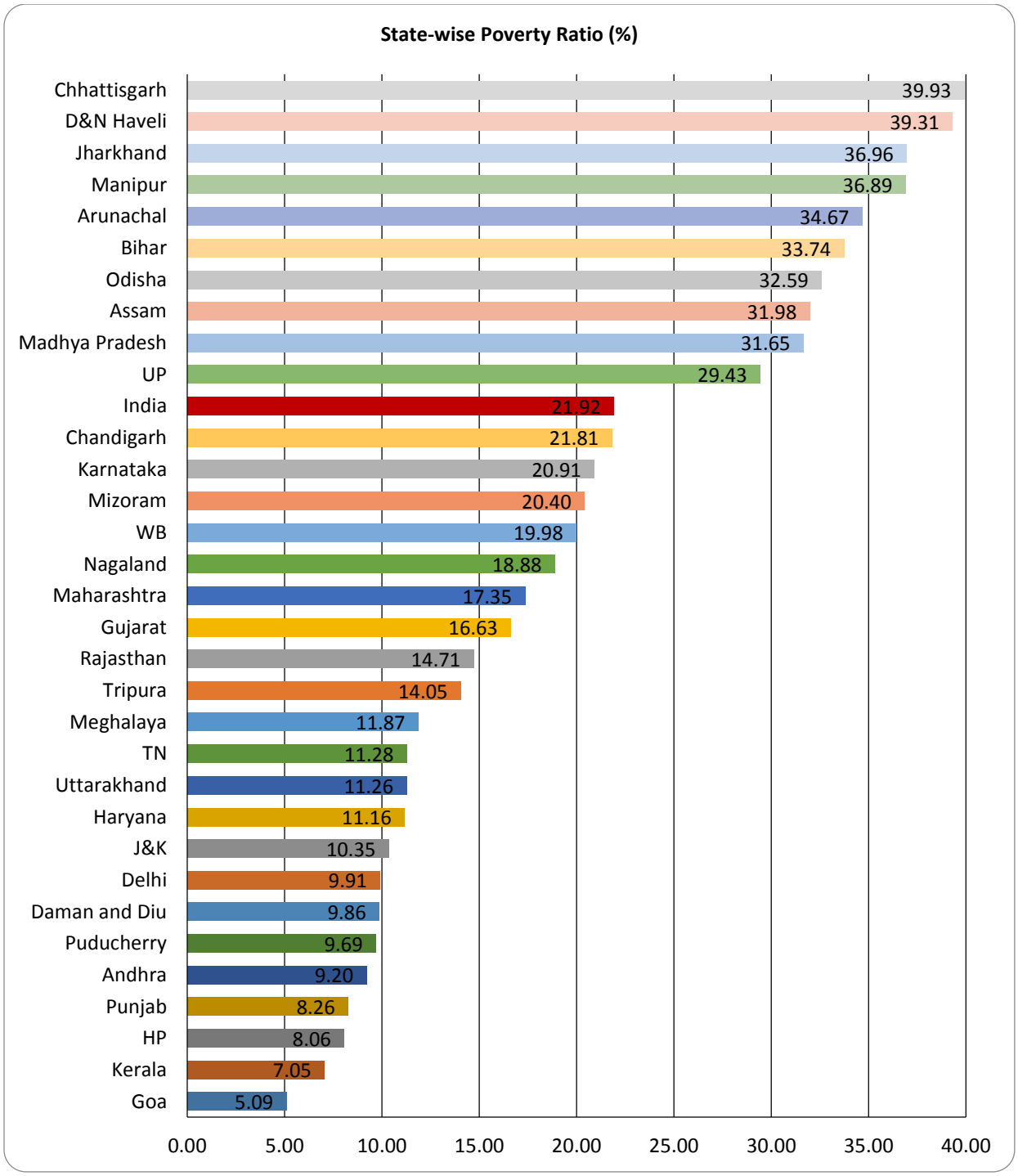
[10] Financial Express (2015). Chhattisgarh rethinks food scheme, to focus on individuals, not families. Sandip Das. January 2. http://www.financialexpress.com/article/fe-columnist/column-govt-must-fast-track-agri-reforms/25220/

[11] Our interactions with the bureaucracy and political leaders in the state of Chhattisgarh revealed that they are quite seized with the problem of 'excessive' withdrawals and even 'recycling' (20-30 percent diversion is very much acknowledged), and looking for ways to plug these loopholes and streamline the PDS functioning. The pressures are coming from galloping food subsidies in the state, making it financially a very expensive program.

[12] Planning Commission. (2013). Press Note on Poverty Estimates, 2011-12 (No. id: 5421).

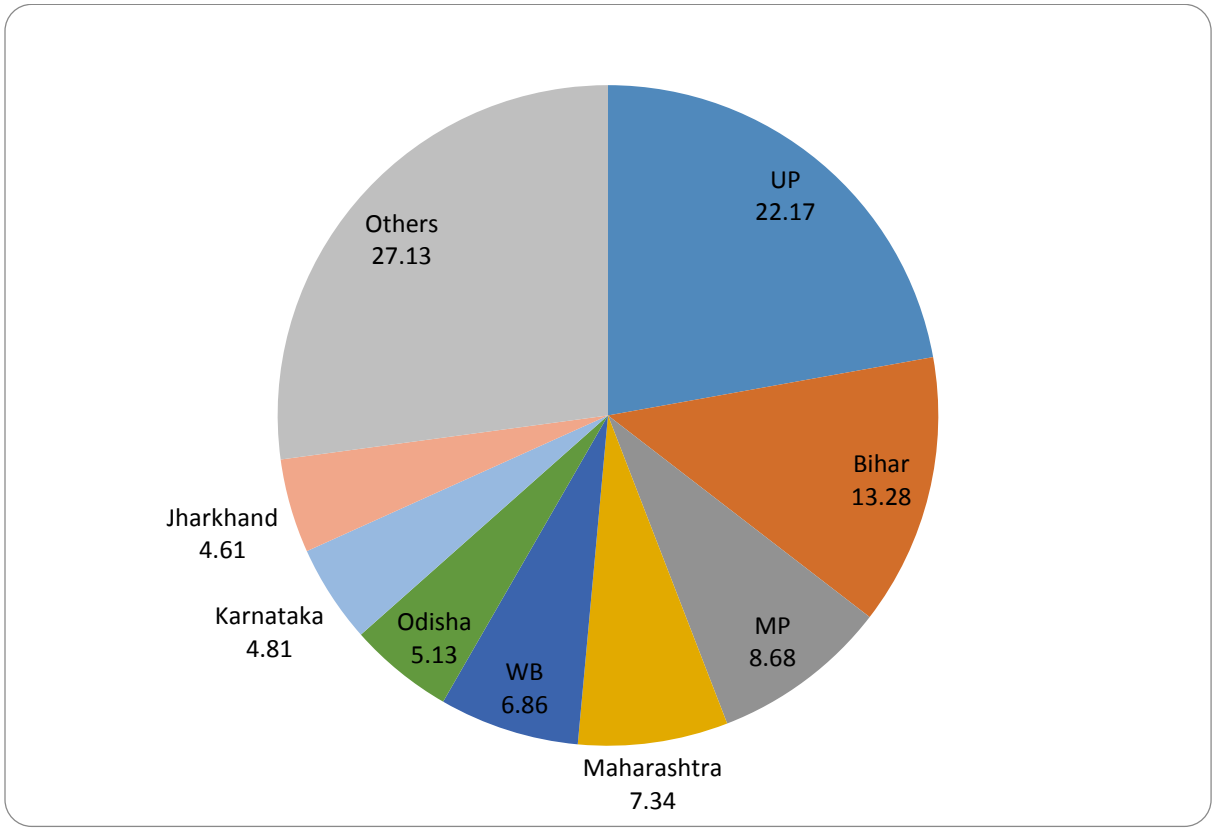
understand better the national spread of the poor, we estimate the relative share of India's poor that reside in each state. (Figure 5)

Figure 4 State/UTs wise Poverty percentages (2011-12)



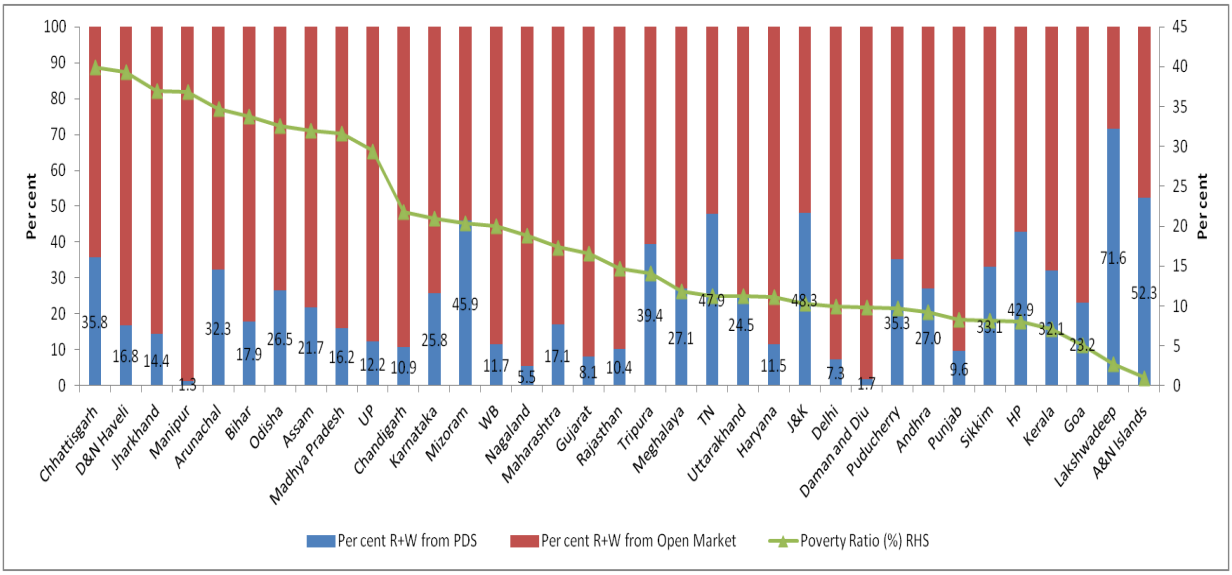
Source: Planning Commission (2011-12)

Figure 5 Relative shares (%) of Selected states in India's poor (2011-12)



Source: Authors' caculation based on data from Planning Commission (2011-12)

Figure 6: State-wise PDS and open-market consumption of rice and wheat vs. poverty ratios



Source: Authors' caculation based on data from Planning Commission (2011-12) and NSSO

As can be seen in Figure 6, of the states with more than 30 per cent of the population below the poverty line, less than 20 per cent of total consumption was met through PDS.

So, one can deduce that the major beneficiaries of PDS are people from those states that have smaller number of poor. In a way, it helps more the better offs than the real poor of the country. In fact, reading together of two state-wise series of poverty and leakage buttressed our statement above. Upon reading the state-wise series of relative shares of each state in the national leakage and the national poor, we found the two series to have a strong positive correlation of 0.89, which implies that the percent contribution to leakage increased with states where greater percent of India's poor resided. In particular, we found that 5 states which are home to close to 60% of India's poor accounted for close to 50% of the total grain leakage in the country in the year 2011-12.

	Percent of India's total poor	**Percent of total leakage from PDS**
UP	22.17	15.3
WB	6.86	11.8
Bihar	13.28	9.6
Maharashtra	7.34	9.1
MP	8.68	5.8
Total of the 5 states	58.32	51.60

Therefore, it is not just the inefficiency of PDS (in terms of high leakages), but its existence is also questioned on equity grounds. If one has to pour more grains under NFSA in this TPDS, it is important to fix it first or better still- find an alternative mechanism that can help the poor more and plug these large leakages. (Gulati and Saini, 2014)

V. Way Forward

Plugging high leakages in PDS is a major challenge. Himanshu and Sen (2011) argue for making PDS universal or near universal to plug leakages as they show in their calculations that states with expanded coverage have very low leakages. But as Khera (2011) very convincingly shows that once the 'top-up' supplies are added on the supply side in case of Chhattisgarh, the leakage rate shot up from -1.5 percent to 37.7 percent. We concur with this view and advise caution in interpreting low leakages in states that have expanded PDS system.

The NFSA, 2013 makes a strong case for using IT, end to end computerization of PDS, and setting up of vigilance committees and courts, etc. to plug leakages from PDS. Technically, even chips can be put in each bag to track their movement through GPS, and biometrics can be introduced at the FPS-level.

The recently released HLC report recommends a leaner and a more nimble FCI structure in an effort towards modernizing the whole grain management system. To plug grain leakages, reduce overall costs and losses of the system, and to induct economic efficiency in it, the report, suggests outsourcing of FCI's three major functions, namely- procurement, stocking and distribution- to states or other agencies like Central Warehousing Corporation (CWC), State Warehousing Corporation (SWC) and private parties. This can help in streamlining the existing system. While we do acknowledge the importance and urgency of these actions, yet we have to consider the fundamental flaw in the design of the policy. The system tries to achieve an equity objective (extending economic access to food for the poor) by using a price policy instrument, instead of an income policy instrument. Fundamental principles of policy making suggest that there is a high probability that the system will fail to deliver on the promises made (as corroborated by the various evaluative studies), or will deliver at a huge cost, which may not be worth the price because the efficiency losses may exceed welfare gains that it is trying to achieve. So, what is the solution?

The answer lies in substituting the present system of state agencies physically distributing grains with cash transfers, direct or conditional. Literature on the best global practices (e.g., in Brazil, Mexico, etc, as elucidated in Gulati *et al*, 2012) also suggest that we move from price policy approach to income policy to help the poor. Chauhan *et al* 2014 also suggest similar approach in a policy brief presented as part of Phase V Training program in LBSNAA, Mussorrie. Research shows successful adoption of conditional cash transfer schemes around the world. The success of the conditional cash transfer (CCT) scheme is demonstrated well by studies on Brazil (Higgins, 2012), Mexico (Rawlings and Rubio, 2005; Behrman and Hoddinott (2005)) and many other countries. The main argument in favour of income policy (direct cash transfers) is that it can plug leakages of grain by linking cash transfer to UID under Aadhaar, reduce efficiency losses as it would be less trade/market distorting and cut down on 'rent seeking' by various intermediaries in the grain-chain.

In fact, one can estimate the likely monetary savings that the country can get by substituting the existing physical grain management system with cash transfers, without giving up the basic objective of helping the poor. This is studied under three main scenarios:

Scenario-1: Where cash transfer per beneficiary equals the effective subsidy being given under the present scheme of things of physical grain distribution under NFSA;

Scenario-2: Where cash transfer per beneficiary equals the difference between the representative market price and the CIPs under NFSA- this income transfer delivers economic access to the beneficiaries by supporting their open market purchase; and

Scenario-3: Given that 75% of the total NFSA beneficiaries are from rural areas, we associate the cash transfer per beneficiary with the difference between the MSPs and the CIPs. In that case,

cash transfer (per beneficiary) is calculated as the difference between MSP and the CIPs- among other things, this transfer will help the system in two ways. Apart from the evident benefits of a cash transfer system, this method would encourage farmers (particularly small and medium farmers who were incentivized under NFSA, to bring their self-consumption grain to be sold, at MSPs, in the procurement mandis only to receive it back at marginal CIPs) to retain their self-consumption grain away from the re-circulation route.

Scenario 2 represents the most likely scenario. Our estimates (details in Annexure 7 show that by substituting the existing physical grain system (under TPDS) with cash transfers, direct or conditional, the country will save the exchequer an amount ranging between Rs. 1,428 crores (Scenario 1) to Rs. 48,657 crores (Scenario 3). Under Scenario 2, which is the most likely scenario, by giving Rs. 17.75 per kilogram per month cash transfer - that is Rs. 621.25 to AAY families and Rs. 443.75 to priority families- the country can save Rs. 33,087 crores annually!

These are large savings for an otherwise fiscally constrained developing economy like India. Ploughing these savings back into agriculture as investments can help agriculture to boost its rate of growth and augment farmers' incomes in a sustainable manner. Apart from this, these savings can also be used to support various other targeted welfare schemes.

It is important to note that the idea of cash transfers is mainly to reduce the involvement of physical grains and give greater autonomy to the beneficiaries to choose their basket of consumption. It should be noted that we are not advocating overnight full substitution of the entire physical grain distribution mechanism with cash, as there will still be need for stocking of grains for strategic reserves and for supplying food to some mountainous, remote and difficult areas, which are food deficit (such as Jammu and Kashmir, north-eastern hill states (NMMT) etc.) and/or identified as so by the State governments. The idea is to link the benefit transfer with the Aadhar card based identification and start by offering a choice between cash and grains to people in the food surplus states and to people living in major cities with a more than a million (53 cities at present have population greater than 1 million). \Next, the offer can be extended to include areas which are food deficit.

The overall sequencing should start in all states, with the farmers who are selling their produce to government agencies under the procurement system and later expand to those left. Obviously, financial inclusion of each household is a pre-condition for implementing such a policy of cash transfers, and the Jan-Dhan Yojana can be a great assistance in this entire policy setting.

Some skeptics have often expressed the view that such cash transfers will lead to increased alcohol consumption and households will remain food insecure. In this connection, it is worth noting that a study by the Government of Delhi and SEWA, under the GNCTD-UNDP project, tested the effects of substituting PDS rations by cash transfers for BPL families in a west Delhi region in the

year 2011. It found that the consumption of the studied food items did not fall, and interestingly, the consumption of items like pulses, eggs, fish and meat went up. Contrary to expectations, the alcohol consumption did not increase; rather, the efficiency of PDS shops surely increased!

Some experimentation with regard to cash transfers in certain schemes at state or national level is already underway. The government of Andhra Pradesh, e.g., has successfully transitioned its social program payments (under NREGS and SSP) to direct benefit transfer via UID- linked bank accounts in the last two years. The roll-out was implemented in 158 sub-districts and affected 19 million people of the state. Muralidharan (2014) shows that the new system of cash transfer, delivered faster, was more predictable, and less corrupt and did not adversely affect the program access. India can learn from the success. Apart from this, PAHAL- the direct benefits transfer for LPG Consumers Scheme, launched earlier in June 2013 by the Ministry of Petroleum and Natural Gas and recently re-launched in November 2014, is a classic current case of delivering cash subsidy directly into the consumer's bank account. Utilizing the evolving IT platform created under the UID scheme and the financial inclusion drive, triggered under the *Pradhan Mantri's Jan-Dhan Scheme*, cooking gas subsidy is already being transferred through cash. Earlier the experimentation was done in 54 districts, but from January 1st, 2015, it is based scaled at pan India level. It may be too soon to anticipate the efficiency of the move, but it surely rids the current inefficient system of the redundant intermediaries and thus of the massive leakages. Extending this to include food subsidy in cash would be a step in the right direction.

Overall, a case is there for reducing the role of the government in food management systems of the country given that the nation has evolved away from its earlier days of famines of 1940s and acute scarcity of 1960s (Saini and Kozicka, 2014) . Today, the nation has emerged as large exporter of cereals, and its godowns are overflowing. This is the right time to switch gears in policy, moving from price policy of highly subsidized grains being distributed through PDS to income policy support (cash transfers) to the poor. If India can make this switch in the next 2-3 years, it can reap huge economic gains, both in terms of efficiency and better equity.

References

Behrman, J. R. and Hoddinott, J. (2005), Programme Evaluation with Unobserved Heterogeneity and Selective Implementation: The Mexican PROGRESA Impact on Child Nutrition. Oxford Bulletin of Economics and Statistics, 67: 547–569. doi: 10.1111/j.1468-0084.2005.00131.x

Government of India (various issues), Monthly Foodgrains Bulletin, (New Delhi: Ministry of Food and Consumer Affairs)

Gulati, A., Gujral, J., & Nandakumar, T. (2012). National Food Security Bill Challenges and Options. Discussion Paper No. 2. Commission for Agricultural Costs and Prices (CACP), GoI, New Delhi

Gulati, Ashok and Shweta Saini (2014). "The National Food Security Act: Challenges and Options ", Chapter 13 in Uma Kapila (ed.), Indian Economy Since Independence. 25th Edition. New Delhi: Academic Foundation.

Higgins, S. (2012). The Impact of Bolsa Família on Poverty: Does Brazil's Conditional Cash Transfer Program Have a Rural Bias?. The Journal of Politics and Society, 23(1), 88-125.

Himanshu and Sen, A. (2011): "Why Not a Universal Food Security Legislation", Economic & Political Weekly, 46(12), 38-47

HLC (2015). Report of the High Level Committee (HLC) on Reorienting the Role and Restructuring of Food Corporation of India. Submitted to Prime Minister by HLC Chairman Shri. Shanta Kumar on January 21, 2015

Khera, R, (2011). Trends in diversion of PDS grain. Economic and Political Weekly, 46(21), 106-114

Muralidharan, K., Niehaus, P., & Sukhtankar, S. (2014). Building State Capacity: Evidence from Biometric Smartcards in India. NBER Working Paper No, 19999.

NSSO (2013). Key Indicators of Household Consumer Expenditure in India, 2011-12 (July 2011-June 2012), vol. KI of 68th round. National Sample Survey Office, Ministry of Statistics & Programme Implementation, Government of India

NSSO(2013). Perceived Adequacy of Food Consumption in Indian Households, (July 2009-June 2010), vol. 547 of 66th round. National Sample Survey Office, Ministry of Statistics & Programme Implementation, Government of India

NSSO (2012). Household Consumption of Various Goods and Services in India 2009-10. Report No. 541 (66/1.0/3)

Planning Commission (2005). Performance Evaluation of the Targeted Public Distribution System (TPDS), Programme Evaluation Organization (PEO), Planning Commission, Government of India

Planning Commission. (2013). Press Note on Poverty Estimates, 2011-12 (No. id: 5421)

Policy Brief on Food Security (2014). UKS Chauhan, BS Bhullar and MK Parida. Made during the Phase V Mid-Career Training Program at Lal Bahadur Shastri National Academy of Administration (LBSNAA), Mussoorie (2014)

Rawlings, L. B., & Rubio, G. (2003). Evaluating the impact of conditional cash transfer programs: Lessons from Latin America (Vol. 3119). World Bank Publications

Saini, S., & Kozicka, M. (2014). Evolution and Critique of Buffer Stocking Policy of India (No. id: 6153)

UNDP (2012). An experimental pilot cash transfer study in Delhi. An initiative under the GNCTD and UNDP project, Government of Delhi. By SEWA Bharat

Annexure 1: Methodology followed to calculate the quantity and the percent of PDS grains that leaked from the system in the year 2011-12

Section #1

The steps followed to calculate "annual" "total" rice and wheat PDS consumption are:

Step1: We take the PDS- rice and wheat monthly per capita consumption data from NSSO. The numbers are given separately for rural and urban areas and for rice and wheat.

Step 2: Using the Census 2011 rural and urban population percent break-up for each state, we convert the numbers in Step 1 to a state number.

Ex. For Andhra, urban areas consume 1.99 kgs of rice from PDS and rural areas consume 3.5 kgs from PDS. Census 2011 says that 33.4% of the Andhra population is urban and remaining is rural. Using this percentage break-up as weights, we calculate the total state number (1.99*0.334+3.5*0.666). This means that in the state of Andhra, per capita monthly PDS rice consumption is 3 kgs.

Total Rice-PDS MPCE 2011/12 (kgs)					
Rice-PDS	Urban	Rural	**Urban(%) Census 2011**	**Rural(%) Census 2011**	Total
Andhra	1.99	3.519	33.4	66.6	3.0

We do a similar exercise for all states and UTs and for wheat. We now have the monthly per capita PDS- rice and wheat consumption figures for all states/UTs. Details in Annex 2

Step 3: We now have to convert the monthly figures to annual figures by multiplying the numbers with 12.

We thus have the annual PDS-rice and wheat per capita consumption figures. (Annex 3)

Step 4: Convert the per capita number to a total state number. For this, we used the total number of persons benefitting from PDS in each state.

The DFPD site gives us the total number of ration cards in each state. Census 2011 gives the average HH size in each state. Assuming that these are family ration cards (which should be the case), we multiply the number of ration cards with the HH size to get the total number of persons

benefitting from PDS. By multiplying the total number of PDS beneficiaries with the per capita PDS consumption number (from Step 3), we get the total PDS consumption number for a state. (Annex 4)

Step 5: We add the annual PDS-rice and wheat consumption figures for each state, to get the total annual PDS consumption of rice and wheat in each state in the year 2011-12.

Section # 2

The steps followed to evaluate the total PDS supply or the total off-take of rice and wheat by all states/UTs under the TPDS in 2011/12

- Food Bulletin gives the total off-take of rice and wheat under TPDS, for each state/UT in all years. We take the TPDS off-take figures for 2011/12 and call this "normal" off-take;
- Apart from this, the DFPD site shows that states/UTs have off-taken grains under ad-hoc allocations four times in the year. These off-takes were in addition to the "normal" allocations above;
- Other than TPDS, centre runs seven (earlier eight, where Village Grain Bank (VGB) scheme, which was functional in 2011/12, was discontinued recently) other welfare schemes (OWSs). Like under TPDS, four schemes out of these, also distribute raw grains. The grain is provided by the Centre. Given that the NSSO-PDS consumption figures are understood to include all the subsidized grain consumption, we thus have to adjust this supply side- number to include the off-take of grains under these four (and VGB) schemes too. (Annexure 2 gives brief of the four OWSs)
- Adding all three heads above, we get the figures for total off-take of grains, which are supplied to States/UTs for subsidized distribution to identified beneficiaries. Details in Annexure 3.

Annexure 2: Brief on the four other welfare schemes (OWSs)

	Scheme Name	Year of launch	Beneficiary	Entitlement	Price at which the Centre Releases grains
1	Annapurna	2001	65 years above not getting Pension under NOAPS	10 kg/person/month- Free of Cost	BPL Rates
2	Wheat-Based Nutrition Program(ICDS)		to children below 6 years of age and expectant/lactating women		BPL Rates
3	SABLA	2010	adolescent girls of 11-18 years	100 grams of grains per beneficiary per day for 300 days in a year	BPL Rates
4	SC/ST/OBC Hostels	1994	residents of the hostels having 2/3rd students belonging to SC/ST/OBC are eligible	15 kg/resident/month	BPL Prices

Source: DFPD

Annexure 3: Off-take of grains in 2011-12

Offtake in 2011-12 (million tonnes)				
States/UTs	**Normal**	**Total AdHoc**	**Total OWSs**	**Total OWS n TPDS**
	1	**2**	**3**	**4=1+2+3**
A&N Islands	0.02	0.00	0.00	0.02
Andhra Pradesh	3.07	0.92	0.08	4.07
Arunachal Pradesh	0.08	0.02	0.00	0.10
Assam	1.66	0.77	0.01	2.44
Bihar	2.76	0.85	0.01	3.62
Chandigarh	0.03	0.01	0.00	0.05
Chhattisgarh	1.09	0.54	0.04	1.67
D&N Haveli	0.01	0.00	0.00	0.01
Daman &Diu	0.00	0.00	0.00	0.01
Delhi	0.55	0.05	0.00	0.60
Goa	0.06	0.02	0.00	0.08
Gujarat	1.24	0.32	0.01	1.57
Haryana	0.59	0.14	0.00	0.73
Himachal Pradesh	0.51	0.12	0.00	0.63
J&K	0.74	0.16	0.00	0.91
Jharkhand	1.02	0.22	0.01	1.24
Karnataka	2.23	0.74	0.04	3.01
Kerala	1.43	0.58	0.01	2.01
Lakshdweep	0.00	0.00	0.00	0.01
Madhya Pradesh	2.65	0.40	0.02	3.07
Maharashtra	3.54	0.70	0.03	4.27
Manipur	0.14	0.06	0.00	0.20
Meghalaya	0.18	0.06	0.00	0.25
Mizoram	0.07	0.04	0.00	0.11
Nagaland	0.14	0.05	0.01	0.20
Orissa	2.06	0.35	0.03	2.44
Puducherry	0.05	0.02	0.00	0.07
Punjab	0.69	0.19	0.00	0.87
Rajasthan	2.08	0.89	0.02	2.98
Sikkim	0.04	0.01	0.00	0.06
Tamil Nadu	3.70	0.77	0.04	4.50
Tripura	0.28	0.05	0.01	0.33
Uttar Pradesh	6.65	1.63	0.01	8.29
Uttarakhand	0.46	0.20	0.00	0.66
West Bengal	3.28	1.10	0.01	4.39
India	**43.10**	**11.96**	**0.39**	**55.45**

Source: Foodgrains Bulletin DFPD

Annexure 4: State-wise MPCE of PDS- rice and wheat

NSSO's monthly per capita (MPC)consumption (kgs) in 2011/12					Census 2011	
States/UTs	Rice-PDS		Wheat-PDS			
	Urban	Rural	Urban	Rural	Urban (%)	Rural (%)
A&N Islands	4.0	4.9	0.6	0.8	37.7	62.3
Andhra	2.0	3.5	0.0	0.0	33.4	66.6
Arunachal	4.2	3.9	0.1	0.0	22.9	77.1
Assam	1.1	2.9	0.0	0.0	14.1	85.9
Bihar	0.6	1.3	0.4	1.0	11.3	88.7
Chandigarh	0.1	0.0	0.8	0.5	97.3	2.7
Chhattisgarh	2.6	4.3	0.6	0.4	23.2	76.8
D&N Haveli	0.4	2.2	0.0	0.0	46.7	53.3
Daman and Diu	0.1	0.0	0.0	0.0	75.2	24.8
Delhi	0.1	0.1	0.5	0.5	97.5	2.5
Goa	1.5	2.2	0.2	0.3	62.2	37.8
Gujarat	0.1	0.3	0.2	0.7	42.6	57.4
Haryana	0.0	0.0	0.7	1.2	34.9	65.1
HP	1.0	2.1	2.0	3.2	10	90
J&K	4.4	4.4	1.6	1.6	27.4	72.6
Jharkhand	0.4	2.1	0.0	0.0	24	76
Karnataka	1.3	2.5	0.2	0.4	38.7	61.3
Kerala	2.0	2.6	0.3	0.4	47.7	52.3
Lakshwadeep	6.4	6.6	0.1	0.1	78.1	21.9
Madhya Pradesh	0.2	0.5	1.1	1.5	27.6	72.4
Maharashtra	0.2	1.1	0.3	1.3	45.2	54.8
Manipur	0.2	0.2	0.0	0.0	32.5	67.5
Meghalaya	1.2	3.2	0.0	0.0	20.1	79.9
Mizoram	4.7	6.7	0.1	0.1	52.1	47.9
Nagaland	0.4	0.8	0.0	0.0	28.9	71.1
Odisha	1.4	3.6	0.3	0.2	16.7	83.3
Puducherry	2.3	3.0	0.7	0.7	68.3	31.7
Punjab	0.0	0.0	0.4	1.2	37.5	62.5
Rajasthan	0.0	0.0	0.7	1.3	24.9	75.1
Sikkim	0.1	4.4	0.0	0.0	25.2	74.8
TN	3.2	4.5	0.4	0.4	48.4	51.6
Tripura	3.4	5.8	0.1	0.1	26.2	73.8
UP	0.3	0.9	0.5	0.7	22.3	77.7
Uttarakhand	0.6	1.8	0.8	1.7	30.2	69.8
WB	0.4	0.9	0.4	0.6	31.9	68.1
India	0.9	1.7	0.4	0.7	31.2	68.8

Source: NSSO

Annexure 5: Converting monthly figures into annual figures

	Monthly per capita consumption (kgs)				Annual per capita consumption (kgs)			
	Rice-PDS	**Wheat-PDS**	**Total PDS-R+W**	**Total Cereals Consumed**	**Rice-PDS**	**Wheat-PDS**	**Total PDS-R+W**	**Total Cereals Consumed**
A&N Islands	4.5	0.7	5.2	10.0	54.2	8.6	62.9	120.3
Andhra	3.0	0.0	3.05	11.3	36.1	0.5	36.6	135.3
Arunachal	4.0	0.1	4.1	12.5	48.0	0.7	48.7	150.5
Assam	2.7	0.0	2.7	12.4	32.0	0.5	32.4	149.4
Bihar	1.2	0.9	2.2	12.0	14.8	11.0	25.9	144.5
Chandigarh	0.1	0.8	0.9	7.9	1.0	9.3	10.3	94.5
Chhattisgarh	3.9	0.4	4.3	12.1	46.9	4.9	51.8	145.0
D&N Haveli	1.3	0.0	1.4	8.2	16.0	0.5	16.5	98.1
D and D	0.1	0.0	0.1	7.1	1.3	0.2	1.5	85.2
Delhi	0.1	0.5	0.6	8.0	1.4	5.6	7.0	95.6
Goa	1.8	0.3	2.0	8.6	21.1	3.0	24.1	103.8
Gujarat	0.2	0.5	0.7	8.4	2.7	5.5	8.2	100.4
Haryana	0.0	1.0	1.0	9.1	0.1	12.5	12.6	109.3
HP	2.0	3.1	5.0	11.7	23.6	36.7	60.3	140.6
J&K	4.4	1.6	6.0	12.4	52.6	19.4	72.1	149.4
Jharkhand	1.7	0.0	1.7	11.6	19.8	0.3	20.1	139.4
Karnataka	2.1	0.4	2.4	9.4	24.8	4.2	29.0	112.5
Kerala	2.3	0.4	2.7	8.4	27.7	4.6	32.3	100.5
Lakshwadeep	6.5	0.1	6.5	9.1	77.5	0.8	78.3	109.3
MP	0.4	1.4	1.8	11.1	4.8	16.8	21.6	133.7
Maharashtra	0.7	0.9	1.6	9.2	8.5	10.4	18.9	110.4
Manipur	0.2	0.0	0.2	13.9	2.2	0.0	2.2	166.4
Meghalaya	2.8	0.0	2.8	10.2	33.1	0.1	33.2	122.7

	Monthly per capita consumption (kgs)				Annual per capita consumption (kgs)			
	Rice-PDS	**Wheat-PDS**	**Total PDS-R+W**	**Total Cereals Consumed**	**Rice-PDS**	**Wheat-PDS**	**Total PDS-R+W**	**Total Cereals Consumed**
Mizoram	5.7	0.1	5.8	12.5	68.3	0.8	69.1	150.4
Nagaland	0.7	0.0	0.7	13.2	8.6	0.1	8.7	158.5
Odisha	3.3	0.2	3.5	13.1	39.2	2.3	41.5	156.9
Puducherry	2.6	0.7	3.2	9.1	30.8	8.0	38.7	109.7
Punjab	0.0	0.9	0.9	9.0	0.0	10.4	10.4	107.7
Rajasthan	0.0	1.2	1.2	11.4	0.1	14.1	14.2	136.8
Sikkim	3.4	0.0	3.4	10.2	40.4	0.1	40.5	122.4
TN	3.9	0.4	4.3	9.0	46.5	5.3	51.7	108.1
Tripura	5.2	0.1	5.3	13.4	61.9	1.2	63.2	160.4
UP	0.7	0.6	1.4	11.1	8.8	7.4	16.2	132.9
Uttarakhand	1.5	1.4	2.9	11.8	17.5	17.2	34.7	141.4
WB	0.8	0.5	1.3	11.2	9.2	6.4	15.6	133.9
India	1.4	0.6	2.1	10.6	17.1	7.7	24.8	127.4

Source: Authors' Calculations from NSSO data

Annexure 6: Converting per capita annual numbers into state numbers

States/UTs	Ration card persons (lakhs)	Annual consumption-million tonnes		
		Rice-PDS	Wheat-PDS	Total PDS-R+W
	1	2	3	4
A&N Islands	4.3	0.0	0.0	0.0
Andhra	987.4	3.6	0.0	3.6
Arunachal	16.8	0.1	0.0	0.1
Assam	293.7	0.9	0.0	1.0
Bihar	438.4	0.7	0.5	1.1
Chandigarh	11.0	0.0	0.0	0.0
Chhattisgarh	321.3	1.5	0.2	1.7
D&N Haveli	3.4	0.0	0.0	0.0
Daman and Diu	1.5	0.0	0.0	0.0
Delhi	148.9	0.0	0.1	0.1
Goa	17.7	0.0	0.0	0.0
Gujarat	535.5	0.1	0.3	0.4
Haryana	173.0	0.0	0.2	0.2
HP	80.8	0.2	0.3	0.5
J&K	122.7	0.6	0.2	0.9
Jharkhand	155.2	0.3	0.0	0.3
Karnataka	556.8	1.4	0.2	1.6
Kerala	354.0	1.0	0.2	1.1
Lakshwadeep	1.1	0.0	0.0	0.0
Madhya Pradesh	719.2	0.3	1.2	1.6
Maharashtra	1022.8	0.9	1.1	1.9
Manipur	20.6	0.0	0.0	0.0
Meghalaya	24.7	0.1	0.0	0.1
Mizoram	12.9	0.1	0.0	0.1
Nagaland	11.9	0.0	0.0	0.0
Odisha	371.0	1.5	0.1	1.5
Puducherry	13.4	0.0	0.0	0.1
Punjab	330.0	0.0	0.3	0.3
Rajasthan	708.8	0.0	1.0	1.0
Sikkim	21.4	0.1	0.0	0.1
TN	764.1	3.6	0.4	4.0
Tripura	42.0	0.3	0.0	0.3
UP	2658.0	2.3	2.0	4.3
Uttarakhand	132.3	0.2	0.2	0.5
WB	859.5	0.8	0.6	1.3
India	11936.6	20.4	9.1	29.5

Source: Authors' Calculations

Annexure 7 Leakages of PDS grains as evaluated under various studies- Since 1999-200 to 2011-12

	1999-2000*			2001-02*			2004-05*≈			2006-07*			2007-08*≈			2009-10^			2011-12#		
	Rice	wheat	food grains	Rice	wheat	food grains	Rice	wheat	food grains	Rice	wheat	food grains	Rice	wheat	food grains	Rice	wheat	total	Rice	wheat	total
Andhra`	15.2	14.4	15.2	12.3	-210.8	11.2	22.3 (24.6)	93 (87.1)	23.2 (25.4)	16.1	66.9	17	19.2 (16.4)	50.3 (53.2)	19.6 (16.8)	15.9	25.9	16.0	11.65	53.64	11.13
Assam	54.7	100	65.3	69.4	98.1	74.9	83.5(83.2)	100(99.9)	88.7(88.5)	72.4	98.4	76.6	73 (71.3)	97.5 (97.2)	77.5 (76.1)	64.4	98.8	69.9	49.25	97.71	60.94
Bihar	94.6	75.2	80.2	77.3	91.6	88.3	84.8(85.3)	92.8 (93.1)	91 (91.3)	83.6	84.4	84	92.4 (92.1)	85.1 (85.3)	89.5 (89.3)	87.8	86.1	87.0	70.49	65.78	68.68
Chhattisgarh`				45.8	33.4	43.2	45.1(45.4)	82.6 (84.6)	51.8 (52.1)	28.9	65.3	30.9	-3.1 (-6.3)	57 (72)	-1.5 (-3)	-15.0	42.7	-6.0	-5.38	47.93	-0.04
Gujarat	-23.9	8.2	-2.5	35.6	27.3	29.8	52.7(51.6)	51.3 (52.7)	51.7 (52.3)	66.1	39.6	53.2	73 (72.5)	53.3 (50.5)	63.1 (61.6)	43.9	52.2	49.7	64.07	76.47	72.20
Hayrana	0	100	100		94	94	-	82.7 (83)	82.7 (83)	39.5	29.4	31.4	61.8 (64.4)	48.8 (46.8)	51.1 (50.2)	0.0	26.0	25.7	64.06	71.83	70.34
HP	-	-	-	26	43.8	31.2	7(7.1)	46.2 (43.1)	27 (25.1)	11.6	32.4	21.8	12.9 (13.1)	14.3 (13.7)	13.6 (13.4)	10.6	15.8	13.8	20.08	25.83	22.49
J&K`	-1.4	-80.3	-12.3	54.1	79	60.7	-8.9()	79.4 ()	23 ()	-36.5	66.4	-1	7.6 ()	59.1 ()	24.3 ()	-25.6	17.6	-12.9	-1.45	13.76	2.28
Jharkhand				71.5	83	79.1	82.3 (81.2)	87.9 (87.6)	85.2 (84.6)	86.4	80.9	84.4	83.3 (81.5)	85.2 (84)	84 (82.4)	72.2	73.8	72.8	74.94	74.54	74.93
Karnataka`	17.1	21	18	47	53.7	48.4	25.8(28.4)	41.7 (39.9)	28.7 (30.4)	32.6	34.4	32.9	42.2 (40)	33.4 (30.6)	41 (38.6)	13.5	5.9	12.4	46.90	44.92	46.40
Kerala	-44.7	5.9	-36.9	-28.6	66.9	0	-1.9 (-0.2)	78.9 (77.8)	25.6 (25)	0.8	55.3	14.8	3.5 (2.9)	55.6 (56.8)	16.2 (16.4)	28.8	51.3	32.9	38.39	62.57	43.22
MP	59.3	18.2	46.9	50.8	46.4	47.4	12.9 (11.5)	56.7 (54)	50.1 (47.2)	52.8	64	61.1	20.8 (24.5)	39.9 (38.5)	35.5 (35.1)	-22.8	51.0	44.8	37.35	55.69	49.32
Maharashtra	24.4	33.3	29.9	40	53.2	48.3	46.5 (44.4)	51 (52.2)	49.3 (49.4)	44.6	38.5	41.4	40.7 (36.3)	44.1 (39.1)	42.5 (37.8)	45.7	49.1	47.7	50.95	58.82	54.86
Odisha	26.8	87.5	36.7	21.4	-	21	74.1(72.8)	99 (100)	76.3 (75.5)	53.4	91.5	57	46.2 (41.2)	97.1 (97.3)	50.2 (45.9)	25.3	87.4	36.4	30.21	81.29	36.83
Punjab	100	-107	-52.9	92.5	87.7	87.9	100 ()	93.1 (94.3)	93.2 (93.9)	71.9	81.1	78.5	17.6 (81.6)	18.4 (1.2)	18.4 (5.2)	0.0	62.2	62.2	91.94	61.08	60.67
Rajasthan	100	53	53.4	76.1	75.8	75.8	100 ()	93.9 (55.8)	93.9 (55.8)	69.8	83.5	81.9	75.7 (75)	82 (52.3)	81.2 (55.4)	0.0	62.1	62.0	-19.17	66.81	66.31
TN`	-12.3	-21.7	-13	-79.2	-	0	9.4 (4.5)	-86.7 (-16.7)	7.3 (4)	2.4	-105.6	-0.7	8.7 (9.9)	-186.1 (-33.3)	4.4 (8.9)	-1.5	-69.6	-5.2	17.81	-28.23	12.22
UP	46.6	17.4	31.1	77.4	67.1	69.7	85.4 (84.4)	36.7 (83.5)	58 (83.9)	72.3	7.8	50.5	52.9 (52.8)	-14.5 (50.9)	26.7 (52.1)	20.0	58.4	43.5	34.76	59.93	47.92
Uttarakhand				-109.8	-810	0	44.2 ()	84.8 ()	59.4 ()	44.2	88.3	63.3	33.3 ()	70.9 ()	48.5 ()	31.6	56.3	45.7	24.13	35.20	30.05
WB	23.8	70.9	57.3	42.4	84	67.3	70.4 (68.9)	85 (92.4)	80.6 (85.2)	72.4	80.4	76.8	70.8 (65.7)	77.9 (86.2)	74.8 (77.9)	61.6	79.9	72.7	52.69	79.70	69.45
Manipur																91.8	99.8	92.7	97.5	100.0	97.8
Meghalaya																38.7	99.8	45.7	61.80	99.04	67.00
Mizoram																-13.5	91.1	-3.2	9.82	90.31	15.17
Nagaland																100.0	100.0	100.0	93.31	99.83	94.72
Tripura																38.6	80.5	42.3	19.49	71.99	19.17
India	9.9	48.6	23.9	18.2	66.8	39	41.3 (40.5)	70.3 (73.1)	54 (54.8)	39.6	61.9	46.7	37.2 (35.9)	57.7 (57.2)	43.9 (42.8)	45.9	59.7	41.2	36.15	62.88	46.72

* From Khera (2011)

^ Authors' estimates. Off-takes are normal TPDS off-takes and PDS MPC numbers are from NSSO with ration card numbers for the year 2011.

As calculated in the paper

Values in the parenthesis are as calculated by Himanshu and Sen (2011)

Source: NSSO and Foodgrains Bulletin

The PDS grain leakage estimates for 2009-10 are done by finding the difference between off-takes (TPDS normal grain off-take in the year) from the Centre and total grain consumed under TPDS by the PDS beneficiaries. The latter number is calculated scaling-up the MPC numbers (from the NSS 66th Round Report[13]) to the annual level first and then to the state level (using the number of ration card as given in the Food Bulletin published for the months of October and November, 2011)

[13] NSSO (2012). Household Consumption of Various Goods and Services in India 2009-10. Report No. 541 (66/1.0/3)

Annexure 8: Calculating savings to the Exchequer resulting from cash transfers substituting physical grain transfer

We study this under three main scenarios:

1. Where the per beneficiary cash transfer equals the effective subsidy given under the present scheme of things of physical grain distribution under NFSA- Under this we give an NFSA beneficiary, a cash transfer equal to the existing effective subsidy of the government;
2. Where the cash transfer per beneficiary equals the difference between the representative market price and the CIPs under NFSA- this income transfer delivers economic access to the beneficiaries by supporting their open market purchase;
3. Given that 75% of the total NFSA beneficiaries are from rural areas, we associate the cash transfer per beneficiary with the difference between the MSPs and the CIPs. In that case, cash transfer (per beneficiary) is calculated as the difference between MSP and the CIPs- among other things, this transfer will help the system in two ways. Apart from the evident benefits of a cash transfer system, this method would encourage farmers (particularly small and medium farmers who were incentivized under NFSA, to bring their self-consumption grain to be sold, at MSPs, in the procurement mandis only to receive it back at marginal CIPs) to retain their self-consumption grain away from the re-circulation route.

Methodology of Calculation

1. Grain Commitment under NFSA

Annual food grain requirement to feed schemes (mainly TPDS, WBNP- ICDS and MDM) under NFSA, is estimated as 61.43 million tonnes. Close to 55 MTs of this total amount is needed to feed the TPDS alone.

Commitment (mntns)	
NFSA TPDS grain commitment	51.9
Tide Over	3
Total NFSA grain commitment	54.9

Compensation of 3 million tonnes, to the 20 states/UTs who got lower TPDS-NFSA entitlement compared to their three year average TPDS off-takes under the old system is referred to as the tide-over allocation.

2. Number of beneficiaries under NFSA

NFSA Beneficiaries (crores)	
AAY- HH	2.4
AAY-persons	12.2
Priority-persons	69.3
Priority-HH	13.9
Total persons-NFSA	81.4
Total HHs-NFSA	16.28

Approximately 81.35 crore persons or 16.57 crore households are to benefit under the TPDS. An average size of an Indian household (Census 2011) is 4.9 or 5.

3. Effective Subsidy under NFSA

Effective subsidy cost under NFSA equals the net costs borne by exchequer. It is the difference between the total adjusted economic costs (which includes procurement cost (MSP and procurement incidentals), distribution cost and adjusted buffer carrying cost) incurred by FCI and the total revenue received by it from its sale.

The TPDS grain need of 54.9 million tonnes, as shared above, includes 51.9 million tonnes to feed the NFSA and the 3 million tonnes as the tide-over. As per the Act, while the 51.9 mntns is sold to states/UTs at the CIPs of Rs.3 and Rs2 per kg for rice and wheat respectively, the tide-over allocation is done at the above poverty line (APL)-CIP of Rs.8.3 and Rs. 6.1 per kg.

Due to the difference in the revenue received by the exchequer the effective subsidy in both the case, needs to be separately calculated.

a. For 51.9 million tonnes under TPDS, NFSA

Base Case: Calculating Effective subsidy (INR/k): Present system of TPDS under NFSA for 51.9 mntns			
	Rice	Wheat	Weighted (55:45)
MSP (INR/kg)	20	14	17.3
Total adjusted economic cost (INR/kg)	30	22	26.4
CIP(INR per kg)	3	2	
Effective Subsidy (INR/kg)	27	20	23.85

We use these values of the *effective subsidy* point 4, to calculate the savings to the exchequer, resulting from substituting the system of physical grain distribution with a cash transfer. We call this the Base case.

b. For 3 million tonnes of tide-over allocation given to 20 states under NFSA

Calculating Effective subsidy (INR/k): For TPDS Tide-over, under NFSA, of 3mntns			
	Rice	Wheat	Weighted (55:45)
MSP (INR/kg)	20	14	17.3
Total economic cost(acquisition, distribution and adjusted annual buffer carrying) (INR/kg)	30	22	26.4
CIP(INR per kg)	8.3	6.1	
Effective Subsidy (INR/kg)	21.7	15.9	19.09
Savings compared to the base case (INR/kg)	5.3	4.1	4.76
Total savings of Exchequer (INR crores)			**1428**

As mentioned before, the difference between the above two tables is in the CIPs received by the exchequer. This results in lower effective rate of subsidization in case b. A saving of Rs.4.8 per kg above would translate into a saving of Rs.1,428 crore for the 3 million tonnes of the tide-over amount.

4. Scenarios under NFSA

Using the effective subsidy calculations in "a" above, we next estimate the likely savings to the exchequer when cash transfers substituted physical grain distributions as under the three scenarios given at the beginning of the note.

Movement to Cash Transfers					
	Row No.	Calculation	Rice	Wheat	Weighted (55:45)
Scenario 1: Complete effective subsidy passed on to the consumer, as a cash transfer					
Cash Transfer (INR/kg)	1	Equals effective Subsidy-base case	27	20	23.85
AAY-HH (INR/HH)(Entitlement is 35kg/month)	2	(1)x35	945	700	834.75
Priority person (INR/HH) (Entitlement is 5kg/month and avg HH size is 5)	3	(1)x25	675	500	596.25
Savings in Scenario 1 compared to Base Case	**4**		**0**	**0**	**0**
Scenario 2: Difference between market price and CIP is given as a cash transfer					
Market Price (INR/kg)	5		23	17	
CIP(INR/kg)	6		3	2	
Cash Transfer (INR/kg)	7	(5)-(6)	20	15	17.75
AAY-HH (INR/HH)(Entitlement is 35kg/month)	8	(7)x35	700	525	621.25

Movement to Cash Transfers					
	Row No.	Calculation	Rice	Wheat	Weighted (55:45)
Priority person (INR/HH) (Entitlement is 5kg/month and avg HH size is 5)	9	(7)x25	500	375	443.75
Savings in Scenario 2 compared to Base Case (INR/kg)	10	Effective Subsidy - (7)	7	5	6.1
Annual savings in Scenario 2 compared to Base Case (INR cores) for 51.9mntns	**11**				**31,659.00**
Scenario 3: Relating cash transfer of effective consumer subsidy to a farmer with MSP					
MSP (INR/kg)	12		20	14	
CIP(/kg)	13		3	2	
Cash Transfer (INR/kg)	14	(12)-(13)	17	12	14.75
AAY-HH (INR/HH)(Entitlement is 35kg/month)	15	(14)x35	595	420	516.25
Priority person (INR/HH) (Entitlement is 5kg/month and avg HH size is 5)	16	(14)x25	425	300	368.75
Savings in Scenario 3 compared to Base Case (INR/kg)	17	Effective Subsidy - (14)	10	8	9.1
Annual savings in Scenario 3 compared to Base Case (INR cores) for 51.9mntns	**18**				**47,229.00**

Thus, the savings to the exchequer in each case would be as follows:

Savings to the exchequer (INR crores)			
	On 51.9 mntns	On 3 mntns	Total Savings
Scenario 1	0	1,428.00	1,428.00
Scenario 2	31,659.00	1,428.00	33,087.00
Scenario 3	47,229.00	1,428.00	48,657.00

LATEST ICRIER'S WORKING PAPERS

NO.	TITLE	Author	YEAR
293	INDIA-PAKISTAN TRADE: PERSPECTIVES FROM THE AUTOMOBILE SECTOR IN PAKISTAN	VAQAR AHMED SAMAVIA BATOOL	JANUARY 2015
292	THE POTENTIAL FOR INVOLVING INDIA IN REGIONAL PRODUCTION NETWORKS: ANALYZING VERTICALLY SPECIALIZED TRADE PATTERNS BETWEEN INDIA AND ASEAN	MEENU TEWARI C. VEERAMANI MANJEETA SINGH	JANUARY 2015
291	INDIA-PAKISTAN TRADE: A CASE STUDY OF THE PHARMACEUTICAL SECTOR	VAQAR AHMED SAMAVIA BATOOL	DECEMBER 2014
290	MACROECONOMIC REFORMS: RISKS, FLASH POINTS AND THE WAY FORWARD	JAIMINI BHAGWATI ABHEEK BARUA M. SHUHEB KHAN	NOVEMBER 2014
289	WHAT EXPLAINS THE PRODUCTIVITY DECLINE IN MANUFACTURING IN THE NINETIES IN INDIA?	SAON RAY	NOVEMBER 2014
288	MEDIA UNDERREPORTING AS A BARRIER TO INDIA-PAKISTAN TRADE NORMALIZATION: QUANTITATIVE ANALYSIS OF NEWSPRINT DAILIES	RAHUL MEDIRATTA	OCTOBER 2014
287	BILATERAL INDIA-PAKISTAN AGRICULTURAL TRADE: TRENDS, COMPOSITION AND OPPORTUNITIES	RAMESH CHAND RAKA SAXENA	OCTOBER 2014
286	CREATING JOBS IN INDIA'S ORGANISED MANUFACTURING SECTOR	RADHICKA KAPOOR	SEPTEMBER 2014
285	MAPPING THE FUTURE OF HIGH VALUE MANUFACTURING IN INDIA	RAJAT KATHURIA MANSI KEDIA UTTARA BALAKRISHNAN	SEPTEMBER 2014
284	ASSESSING THE FUTURE OF TRADE IN THE AUTOMOBILE SECTOR BETWEEN INDIA AND PAKISTAN: IMPLICATIONS OF ABOLISHING THE NEGATIVE LIST	BISWAJIT NAG	SEPTEMBER 2014

About ICRIER

Established in August 1981, ICRIER is an autonomous, policy-oriented, not-for-profit, economic policy think tank. ICRIER's main focus is to enhance the knowledge content of policy making by undertaking analytical research that is targeted at informing India's policy makers and also at improving the interface with the global economy. ICRIER's office is located in the institutional complex of India Habitat Centre, New Delhi.

ICRIER's Board of Governors includes leading academicians, policymakers, and representatives from the private sector. Dr. Isher Ahluwalia is ICRIER's chairperson. Dr. Rajat Kathuria is Director and Chief Executive.

ICRIER conducts thematic research in the following seven thrust areas:

- Macro-economic Management in an Open Economy
- Trade, Openness, Restructuring and Competitiveness
- Financial Sector Liberalisation and Regulation
- WTO-related Issues
- Regional Economic Co-operation with Focus on South Asia
- Strategic Aspects of India's International Economic Relations
- Environment and Climate Change

To effectively disseminate research findings, ICRIER organises workshops, seminars and conferences to bring together academicians, policymakers, representatives from industry and media to create a more informed understanding on issues of major policy interest. ICRIER routinely invites distinguished scholars and policymakers from around the world to deliver public lectures and give seminars on economic themes of interest to contemporary India.