Reducing Public Distribution System Leakages and its strategy

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Abstract: *Government of India implemented Public distribution system (PDS), to remove the food insecurity from the country; it is now in debate for its implementation day by day. This brings more challenge due to several issues like Government has to spend 3.65 rupees to transfer 1 rupee to a Below Poverty Line family, to deliver the available food grains to the real beneficiaries with minimizing the leakages with more cost effective manner. After National Food Security act, 2013, the Government is coming with number of strategies and welfare schemes to minimize the leakages so as to feed the 75% of rural and 50% of rural population of India with highly subsidized food grains. This leakage is increasing day by day due to some avoidable reasons especially for five states like UP, Bihar, MP, Maharashtra and West Bengal which is considered as 60% of India's poor population. This paper attempts to find the reasons of leakages in Public Distribution system and suggest some remedial measures.*
Key words: *Public Distribution System, Leakages, Strategy*

I. Introduction:

The PDS depends upon central and state level policies. The PDS is collecting food grains from farmers through FCI and other agencies and stored at FCI and private hired godowns for distributing to different states on the basis of pre-determined number of beneficiaries on various welfare schemes. The PDS is always facing problems like corruption and leakage. Leakage means the proportion of food grains released from Government of India that fails to reach the real beneficiaries. The leakage is considered as the mismatch between the off-take and distribution of food grains to the consumer. The main reason of leakage is 'diversion'. Where the actual amount of food grains is not reaching the intended beneficiaries. Some states have reported better performance of PDS where the consumption was much where as some states reported low consumption of PDS food grain. The real poor mass is deprived from the subsidized food grains due to the leakages in PDS system, where in Odisha the percentage of poor is 32.59% and the state Goa is having the lowest rate i.e., 5.0%

State/UTs wise percentage leakages of food grains from PDS (2011-12)

PDS grain Leakages as percent of offtake			
Chhattisgarh	0.0 %	D&N Haveli	53.7%
J&K	2.3%	Maharashtra	54.9%
Andhra	11.1%	Punjab	60.7%
TN	12.2%	Assam	60.9%
Mizoram	15.2%	Rajasthan	66.3%
Arunachal	17.6%	Meghalaya	67.0%
Tripura	19.2%	Bihar	68.7%
HP	22.5%	WB	69.4%
Puducherry	23.1%	Haryana	70.3%
Uttarakhand	30.0%	Gujarat	72.2%
Odisha	36.8%	Jharkhand	74.9%
Kerala	43.2%	Chandigarh	75.7%
Karnataka	46.4%	Delhi	82.6%
India	46.7%	Nagaland	94.7%
UP	47.9%	Daman and Diu	95.8%
Goa	48.7%	Manipur	97.8%
Madhya Pradesh	49.3%		

(Source: Gulati Saini 2015)

After the introduction of targeted PDS program in 1997, the individual states were responsible to identify the BPL families to distribute the ration cards and ensure them the entitled food grains as the rice allotment increased from 10 kg to 35 kg. Despite of leakages in PDS, the system is improving in terms of securing food grains to the real needy poor mass. We have taken one attempt to find out the cause of leakage and trying to suggest on that basis.

II. Literature Review:

As per the 2011 census, the population of Odisha was 41947358, where the off take in 2011-12 was 2058000 tones. The five states like UP, Tamilnadu, Maharashstra, West Bengal and Andhra Pradesh getting 46.93% of total PDS off take but other states getting the rest of the food grains (Kavita 2014). There is a huge regional disparity in distributing food grain where some states are getting maximum and some states are getting very less portion of PDS food grain, (Swaminathan 2000). Mishra (2008) pointed out that 58% subsidized food grains from central pool do not reach the real needy families due to leakage. The interstate variation can be minimized by distributing the food grains on the basis of size of population and its requirements, (Kavita, 2014). In order to deliver 5 kg per person per month the Government will have to allocate 8.3 kg per person per month at subsidized price which will increase the real expenditure of the Government, (Dipa sinha, 2012). The idea of cash transfer to the account of PDS beneficiaries will reduce the involvement of physical grains and a choice to the user between cash and grain, (Gulati Saini 2015). The cash transfer can be a problem as in the survey it was found that , buying ration with money would entail first going to bank and then to the market for purchasing the food grains, would result in wastage of money and time as both are far away from the respondent's place, (Ankita Aggarwal 2011). Gulati saini (2015) has pointed out the leakage in PDS by comparing the supply of grains and demand/ consumption of grains. Praveen Jha (2013) has done an analysis of financial provision to ensure food security for all in the country. The current PDS can improve the food consumption but not sufficient to overcome the problem of malnutrition in India, (Radhakrishna Reddy, 2002). As per Khera (2011), initially the percentage of food grain leakage was 24% then 54% grains leaked during 2004-05 and at the end of the period 44% of PDS grain was diverted in all over the India. In 1993-94, about 24.1% population was using the PDS rice and wheat , where as in 2011-12, it was increased to 45.6% of Indian population,i.e, the average consumption per household per month in 1993-94 increased from 4.58 kg to 9.56 kg in 2011-12, (Deepankar Basu, Debarshi 2014). Kotwal et al (2011) pointed out that the states procurement and distribution system is in fault where it is being argued that the poor should be provided cash through biometric cards, they can purchase food grains at market price. Mihika (2013) in one of the survey on koraput district of Odisha found that, 61% of households have access to PDS out of which 38% BPL card holders and 62% having other cards and the major problem was due to the 'exclusion error', i.e, maximum households are deprived from PDS access. Lack of access to FPSs is very important in rural states. In 2001, the state Chhattisgarh granted licenses to private owners under the Sarvajanik Nagrik Poorti Vitran (SNPV) scheme resulting the number of FPSs became doubled between 2001 and 2004, (Krishnamurty, Pathania and Tandon 2014). The impact of PDS on riral poverty is very low as (Dreze Jean 2013) in his studty compared and calculated the impact of food grain purchase from PDS and the open market. The reduction in food grain subsidy will decrease the market price of ffod grain,resulting the PDS users will not switch their purchasing habit from PDS,(Ramaswami,Balakrishnan 2002). Both the inclusion and Exclusion error is important. The problem is to identifying the BPL households who should be included in the PDS transactions.(Sharan 2011).

Case Analysis: We have done the analysis on Odisha, by taking the views of ten respondents of different villages of Dhenkanal District through questionnaire (Annexure-1). We have taken some parameters to judge the leakage in Odisha.

Govt. Level problems for leakage
1. Regional disparities in PDS allocation
2. Monopoly in distributing the ration cards.
3. No vigilance committee and courts.
4. Distributing to APL families more than the BPL families.
5. Lost due to storage capacity.
6. Lack of digitization of PDS.
7. Not keeping proper track of food grains carrying vehicles.
   FPS level problems for leakage
1. Diversion of food grains in the open market.
2. Duplicate cards/ bogus cards.
3. Misappropriation in weight during delivery.

We have applied Friedman Two-way ANOVA in our analysis. Milton Friedman, an economist and noble laureate introduced the test in 1937. It is well known as "friedman ANOVA". The test is widely used as the computation is very easy where the normality of population sample is not required. This test is used for analyzing the ordinal scaled responses given to several attributes or elements by 'n' numbers of objects or individuals. The variables are the ordinal scaled variables and the sample size can be any.

Procedure:
1. Formulate hypothesis of no difference in the ranking of different treatments (columns) by different elements (blocks).
2. Ensure that the ranks are assigned by each element across all the treatments. If the responses to treatments were measured in numerical scores (rather than ranks), they need to be ranked first for each block separately.
3. Sum up the ranks formed for each treatment (Column).
4. Square the sum of ranks obtained for each treatment (Column).
5. Apply the Friedman statistical formula.

$$X_r^2 = \frac{12}{NK(k+1)} \sum_{j=1}^{k} R_j^2 - 3N(k+1)$$

Where N= number of blocks, that is number of rows
K= number of treatments, that is number of columns
R= Sum of ranks in the jth treatment group.

III.   Analysis:

Using a sample of 25 PDS users, it was decided to find out the major factors influencing the leakage in PDS. Ten factors such as regional disparities on PDS allocation (RDA), diversion of food grains in open market (DFOM), lack of storage capacity (LSC), Not keeping proper records (NKPR), no vigilance committee and court (NVCC), Monopoly in distributing the ration card (MDRC), Distributing to APL families more than the BPL families (DAFTBF), Lack of digitization of PDS (LDP), Duplicate cards/ bogus cards (DC/BC), Misappropriation in weight during delivery (MWDD) were identified and presented to those 25 respondents who were asking to rank order the major factors that influence the leakage in PDS. They were told to assign rank '1' to the factor that was most influential, rank '2' for more influential and so on for 10 factors.

Factors influencing the leakages in PDS

Respondents	RDA	MDRC	DAFTBF	DFOM	LDP	LSC	NKPR	DC/BC	NVCC	MWDD
					Ranks assigned					
Respondent 1	3	7	6	1	9	8	4	2	10	5
Respondent 2	4	8	5	1	10	7	3	2	9	6
Respondent 3	3	7	6	2	8	9	5	1	10	4
Respondent 4	1	9	5	3	10	7	6	2	8	4
Respondent 5	3	6	7	4	10	8	1	2	9	5
Respondent 6	1	6	5	2	9	8	4	3	10	7
Respondent 7	3	7	6	1	9	10	5	2	8	4
Respondent 8	4	6	7	2	9	8	3	1	10	5
Respondent 9	2	8	5	1	9	7	4	3	10	6
Respondent 10	4	7	6	3	10	8	1	2	9	5
Respondent 11	3	6	7	2	10	8	5	1	9	4
Respondent 12	2	7	5	1	9	8	4	3	10	6
Respondent 13	3	8	5	2	10	7	6	1	9	4
Respondent 14	3	6	8	1	7	9	4	2	10	5
Respondent 15	4	6	5	1	10	9	3	2	8	7
Respondent 16	1	7	5	2	8	9	4	3	10	6
Respondent 17	3	9	4	2	10	7	5	1	8	6
Respondent 18	5	6	7	2	9	8	4	1	10	3
Respondent 19	6	8	4	3	7	10	1	2	9	5
Respondent 20	3	7	6	2	10	8	4	1	9	5
Respondent 21	5	8	7	2	9	6	1	3	10	4
Respondent 22	3	9	6	1	10	7	4	2	8	5
Respondent 23	4	7	5	1	10	9	3	2	8	6
Respondent 24	2	6	7	1	9	8	5	3	10	4
Respondent 25	3	7	5	2	10	8	4	1	9	6

 (Source: Data from the questionnaire)

Is there any significance difference among the factors influencing the leakages in PDS, i.e. can we identify the factors that are most likely to influence the leakage in PDS.

Step-1

Formulate a null and an alternate hypothesis:

Ho = There is no significance difference among the factors influencing the leakage in PDS.

H2 = There is a significance difference among the factors influencing the leakage in PDS.

Step-2

Assign ranks for each treatment by rows. The present data itself is in the form of ranks awarded by each firm (row) across the factors (column). Thus, there is no need for us to convert the data into ranks again. Therefore, let us retain the same ranking pattern.

Step-3

Sum the ranks formed for each treatment and square them as shown in the following table:

Respondents					Ranks assigned					
	RDA	**MDRC**	**DAFTBF**	**DFOM**	**LDP**	**LSC**	**NKPR**	**DC/BC**	**NVCC**	**MWDD**
Respondent 1	3	7	6	1	9	8	4	2	10	5
Respondent 2	4	8	5	1	10	7	3	2	9	6
Respondent 3	3	7	6	2	8	9	5	1	10	4
Respondent 4	1	9	5	3	10	7	6	2	8	4
Respondent 5	3	6	7	4	10	8	1	2	9	5
Respondent 6	1	6	5	2	9	8	4	3	10	7
Respondent 7	3	7	6	1	9	10	5	2	8	4
Respondent 8	4	6	7	2	9	8	3	1	10	5
Respondent 9	2	8	5	1	9	7	4	3	10	6
Respondent 10	4	7	6	3	10	8	1	2	9	5
Respondent 11	3	6	7	2	10	8	5	1	9	4
Respondent 12	2	7	5	1	9	8	4	3	10	6
Respondent 13	3	8	5	2	10	7	6	1	9	4
Respondent 14	3	6	8	1	7	9	4	2	10	5
Respondent 15	4	6	5	1	10	9	3	2	8	7
Respondent 16	1	7	5	2	8	9	4	3	10	6
Respondent 17	3	9	4	2	10	7	5	1	8	6
Respondent 18	5	6	7	2	9	8	4	1	10	3
Respondent 19	6	8	4	3	7	10	1	2	9	5
Respondent 20	3	7	6	2	10	8	4	1	9	5
Respondent 21	5	8	7	2	9	6	1	3	10	4
Respondent 22	3	9	6	1	10	7	4	2	8	5
Respondent 23	4	7	5	1	10	9	3	2	8	6
Respondent 24	2	6	7	1	9	8	5	3	10	4
Respondent 25	3	7	5	2	10	8	4	1	9	6
R_j	78	178	144	45	231	201	93	48	230	127
R_j^2	6084	31684	20736	2025	53361	40401	8649	2034	52900	16129

$$\sum_{j=1}^{k} R_j^2 = 6084+31684+20736+2025+53361+40401+8649+2034+52900+16129=234003$$

Step-4

Calculate the Friedman statistic value:

$$X_r^2 = \frac{12}{NK(k+1)} \sum_{j=1}^{k} R_j^2 - 3N(k+1)$$

= 12/25x10(10+1) x (234003)-3x25(10+1)

= 12/2750x234003-825

= 0.004363x234003-825

= 1020.96-825

= 195.96

Step-5

Calculate the Friedman critical value. We have the number of columns (k) that is 10, we can refer to table 1 found, which gives the chi-square critical value. The table value for 10 per cent level of significance for (k-1) degrees of freedom (that is, 9) is 14.648.

Step-6

Compare the calculated and critical Friedman value and make a decision. Since the calculated Friedman statistic of 195.96 is greater than critical value of 14.648, we conclude by stating that the ranking of factors assigned by sample in influencing the leakage in PDS is significantly different. That is, at least one factor is most influential in the leakage in PDS. Hence, we reject the null hypothesis of no significant difference in the factors influencing the leakage in PDS. Looking at the Rj scores, we find that Diversion of food grains in the open market (DFOM) is the most influential factor (because the R value is too small compare to R value of other columns) in the decision of leakage in PDS.

IV. Conclusion

The aim of this article was to highlight the corruption in terms of leakages in Public Distribution system in the state of Odisha. The survey made on seven villages of Dhenkanal District like Bhapur, Nuagan, sankarpur, ranapasi, Mangalpur, khajuria, Indipur. During the survey the data was collected through questionnaire from the respondents from the said villages and the conclusion drawn from this it that the leakages is due to the diversion of food grains to the open market where the actual PDS users are not getting the actual food grains at right amount at right time. Another problem observed that the losses of food grains due to the lack of storage capacity in respective areas and to the some extend the leakage is happening during the transit of food grains from the Government to the FPSs. So we are suggesting to keep restriction on the appointment of dealers to ensure the actual food grains coming from the central pool should reach to the actual beneficiaries. There should be proper storage capacity to minimize the losses of food grains and properly identifying the BPL families to decrease the duplicate cards in the market which is the main reason of diversion of food grains to the open market. To keep a proper track of requirements of different areas for better allotment resulting minimize in the leakage of food grains.

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