

ROLE OF PUBLIC DISTRIBUTION SYSTEM ON FOOD SECURITY AND NUTRITIONAL STATUS: A COMPARATIVE STUDY BETWEEN RURAL AND URBAN HOUSEHOLDS IN ODISHA

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ABSTRACT

This study substantiates the role of public distribution system in food security by evaluating the expansion of the state-run food aid program in the state of Odisha, India. Over the years, percentage of households' consumption of rice, wheat and sugar from PDS has been increasing whereas there has been a decrease in consumption of kerosene from 2009-10 to 2011-12. Comparisons of rural and urban households of Odisha, show that rural households hold a major share in PDS consumption of all items except for wheat. Also, majority of the rural households possess ration cards whereas majority of the urban population do not possess. In rural Odisha, calorie intake has seen moderate improvement from 1995 calories per capita in 1972-73 to 2116 calories per capita in 2011-12. Intake of fat has also increased significantly from 8 per cent to 24 per cent during the same period whereas protein intake has remained stagnant. Thus, provision of pulses and protein-rich foods through PDS can improve the situation. The overall study suggests that the PDS has positively impacted the households' food security in the region, however, it does not entirely meet the adequate calorie requirements.

KEY WORD: PDS, Food Security, Per-Capita Calorie, Odisha,

1. INTRODUCTION

The Public Distribution System (PDS) in India is the largest distribution network in the world. The PDS was introduced during the Second World War as a measure of public rationing in wartime. Prior to the 1960s, distribution through the PDS was generally dependent on food imports. The system was expanded in the 1960s due to the current food shortages. Subsequently, the Indian government established the Agricultural Price Commission and the Food Corporation of India to improve the domestic food supply and storage of food grains for PDS. By the 1970s, the PDS had become a universal subsidized food distribution system. In the 1990s, the program was revised to improve access to food for people in hilly, remote and inaccessible areas where a significant portion of the poor lived. A restructured Targeted Public Distribution System (TPDS) was launched in 1997, under which households were classified as Above Poverty Line (APL) or Below Poverty Line (BPL), based on the economic status of householders. While BPL households have continued to receive subsidised foodgrains through TPDS, the subsidies for APL households have gradually been phased out. The Government of India also introduced the Antyodaya Anna Yojana (AAY) in December 2000 to provide highly subsidised food to millions of the poorest families, and the Annapurna Yojna in 2001 for those persons not enlisted for the National Old Age Pension Scheme (NOAPS) who are entitled to receive 10 kg of foodgrains (6 kg of wheat + 4 kg of rice) per month free of cost as a Food Security measure. Eligible households are given a ration card that entitled them to buy fixed rations of selected commodities. The products are offered through a network of shops at the fair price (FPS). The main products distributed via FPS are wheat, rice, sugar and kerosene, which are supplied to rural and urban populations. Surpluses of foodgrains generated by increasing crop yields are also managed by the Food Corporation of India (FCI), which was established under the Food Corporation Act 1964. The FCI procures foodgrains under its minimum support prices (MSP) systems and levy schemes, and stores, preserves and maintains PDS food stocks, while supplying foodgrains to the States/Union Territories, in accordance with the broad national policy on food security. PDS can thus be regarded as one of the most important and stable elements of food policy, in India's fight against hunger and poverty. The main objectives of the PDS system are threefold: (a) to provide foodgrains to the poor at affordable prices; (b) to support farmers by purchasing foodgrain stocks from them at reasonable prices, and (c) to maintain national food security by holding stockpiles of foodgrains for the future.

1.1 Statement of the Problems

Odisha is the second poorest state of India comprising of 4.74 percent of India's land mass and 3.6 percent of the country's population and 5 percent of the country's poor (Xaxa, 2014). According to the census 2011, 83.31 percent of the population lives in rural Odisha. The Scheduled Caste (SC) and Scheduled Tribe (ST) population comprised 17.13 and 22.85 percent respectively of the total population of the state (Census 2011). About 45 percent of the geographical area of the state has been declared as Scheduled area. According to the report of Planning Commission (2008), the incidence of poverty among ST and SC was 46.4 percent compared to 27.5 percent of national ST, SC population both in rural and urban areas are poor. As per the official poverty line figures, 17.29 percent of the urban and 35.69 percent of the rural population was found to be poor in 2011-12 (Planning Commission, 2013). India State Hunger Index, 2008 reports Odisha to be suffering from "alarming" level of hunger (Menon et. al., 2009). High level of food insecurity is evident in the form of higher mortality and under-nutrition, especially amongst the scheduled tribes (STs) and the scheduled castes (SCs). Against the overall 43 percent of the children being highly underweight in the state, the share of the scheduled tribes (STs) and (SCs) was found to be much at 59 percent and 59.4 percent respectively (World Food Program & Institute for Human Development, 2008). In rural areas, the incidence of poverty among STs was the highest in Odisha was 46.4 percent. As per the Planning Commission of Government of India, 32.6 percent of the population lives BPL line in Odisha and 52 percent population of the state were dependent on the PDS for the rice consumption (Planning Commission 2011-12). The per capita income in Odisha is one of the lowest among 17 major states (Food Security Atlas of Rural Odisha, 2008). Beside all these food insecurities, Odisha is facing chronic poverty and the state has been placed in the category of the "severely food insecure" regions. Hence, the PDS was started with an objective to provide the poor and vulnerable sections of society, certain essential commodities of daily use at subsidized prices. This system, in turn, will bring about stability of the market price of different essential commodities, availability of food grains and equity in distribution.

2. LITERATURE REVIEW

The literature review is based on the necessary guidelines as well as feedback for the fulfillment of objectives of the study. It has been divided into two parts; first one is PDS in India and its impact; second, food security and nutritional status.

2.1 PDS and its impact on Food Security:

Kumar et al. (2016) have studied on PDS in Bihar, where it has been demonstrated that the PDS has a positive impact on food security and nutritional status due to better physical access of food items through FPS network. Kumar et al. (2015) documented the success of the PDS to tackle the double problem of poverty and malnutrition. However, there has been a positive and significant impact of PDS on food security and nutritional intake (Kumar et al., 2012; 2017). Similarly PDS have a positive impact on household food security. However complete food security has not been provided to the beneficiary's families as they were more dependent on non-PDS sources (Takri & Choubey, 2022). In the same way in Odisha, there has been seen significant improvement in the implementation of the PDS between 2004 and 2010 (Khera 2011b; 2011c). The PDS system is having a significant impact on malnutrition in India by household per capita consumption of calories and proteins, where the efficiency has a different effect on different regions in the country (Jha et al., 2010). In another comparative study on PDS by the same authors (Jha et al., 2013) based on factors such as food subsidies, income transfer and poor participation, the program was not targeted and the poor benefited from subsidies. Radhakrishna et al. (1997) noted that the PDS welfare gains in income transfer were very low and that the impact on poverty and nutrition was also low. The ineffectiveness of PDS is existing due to the corruptions are occurring in black market (Jha & Ramaswami, 2010). Ahluwalia (1993) investigated PDS issues that revealed that about one-third of the food grains and sugar and more than half of the edible oil that feeds the PDS are exiting the program. Parappurathu et al. (2015) showed that the households with access to PDS have greater dietary diversity score. FPS's are the most easily available source of food grains, especially for rural beneficiaries (Balasubramanian, 2016). The impact of the PDS and the elasticity of income transfers do not correspond to the amount of money transferred to non-food items (Dreze 2010, Khera 2011a). There is a positive impact on food security on population, where government expenditure on rural development maintains as a macro variable (Applanaidua et al. 2014).

2.2 Nutrition and Food Security

The National Food Security Act (2013) focuses primarily on ensuring food security through the expansion of PDS. However, to what extent this would lead to food security depends on how families respond to the availability of cheap grain. For instance, families that depend on PDS for buying cheap cereals save money to buy other nutritious foods like milk, fruit, nuts and perhaps eggs and meat (Bhargava, 2014). This should significantly improve the income diversification opportunities of rural households by an optimum combination of interventions

to enhance the food security Abafita and Kim (2014). Rahman (2016) has found that the calorie intake and food security has improved by PDS through food subsidies and the PDS system has a positive impact on households' nutritional intake. The availability of food followed by the food accessibility a study has been done in rural household's food security of 20 regions from Africa and Asea (Bashir and Schilizzi, 2013). Prosekov and Ivanova (2018) have studied that the hunger does not occur as a consequence of food grain limitation but due to the scarcity of income sources of households in most of the developing countries making food products inaccessible for a large number of households. The food insecurity also causes growth of non-communicable diseases like, cardiovascular, diabetes and cancer in India (Upadhyay, 2012). Bhat and Hussain (2012) have considered PDS to be the largest nutritional support program in India and perhaps worldwide affecting nearly 10.5 crores of households in the country and supplies grain at subsidized prices. With increase in income, families consume more of processed foods and abandon healthier cereals considering them as inferior foods (Mohan et al., 2010). To some extent, this shift in consumption pattern has led to growth in the incidence of diseases like diabetes in India (Ghaffar et al., 2004). A study by Chakravarty and Dand (2006) on food insecurity in Gujarat of Rajkot district, has shown that several children are suffering from malnutrition due to lack of proper nutrition and around 73.66 percent population of this district are found to be food insecure for more than six months.

3. METHODOLOGY

This study has been evaluated in the hunger prone state of Odisha in India. It is based on the role of Public Distribution System in food security and nutritional status of rural households in Odisha. In this study simple statistical tool has been used to draw the table, pie chart and result of the study. In this study it has been used secondary data only. It is an empirical study based on the quantitative data only. The data used in this paper comes from the national representative consumer expenditure survey (CES) conducted by the National Sample Survey Organisation (NSSO). The household data is based on quantity consumed of PDS items, monthly per capita consumption of PDS food items, and the nutritional intake and its measurement from NSSO survey data under the 68th round covering the year 2011-2012.

In this study attempted to analyse how the PDS has served the rural and urban areas according to the ration card possessed by different social group in Odisha. We also describe the households quantity consumed and its value, percentage of households share in rice, wheat/atta, sugar and kerosene consumption of PDS during last 30 days and type of ration card and their average quantity and value of average monthly household's consumption of PDS items.

4. RESULT AND DISCUSSION

The following table No.1 shows contribution of PDS to total quantity of consumption for each of the 4 items: rice, wheat/atta, sugar and kerosene, and also percentage of households reporting consumption from PDS during a 30-day period during 2004-05, 2009-10 and 2011-12. Rice purchased by households from PDS in rural India, or the share of PDS in rice consumption was 13.2%, 23.5%, and 27.9% in 2004-05, 2009-10, and 2011-12, respectively.

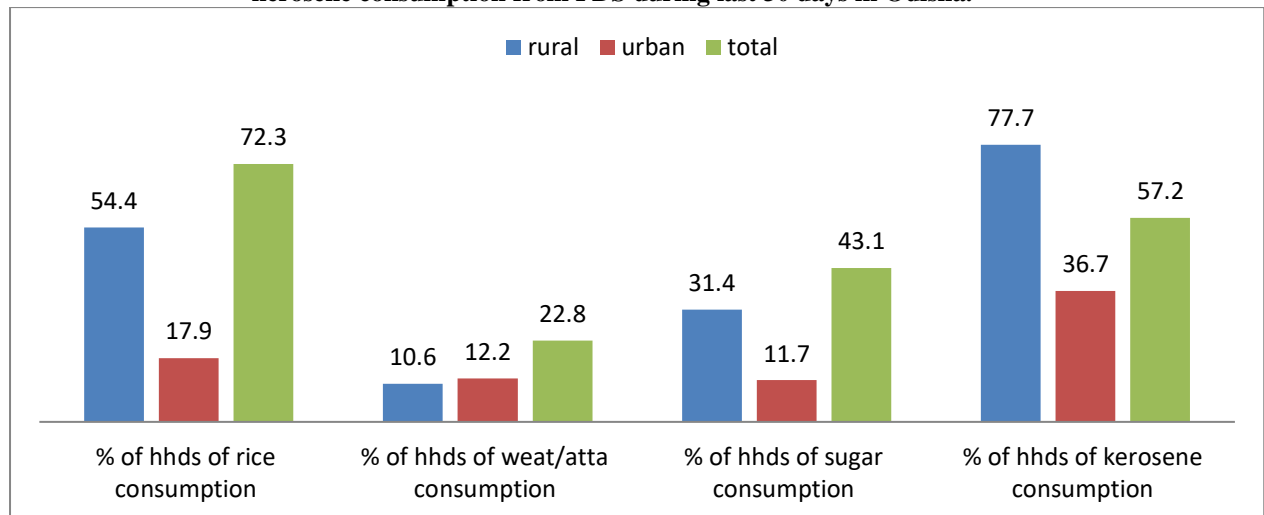
The rice consumption has increased from 2004-05 to 2011-12. There has been also an increase in the share of consumption in wheat/atta, and sugar, where the monthly per capita consumption also increased but in the kerosene consumption, there has been a decrease from 2009-10 to 2011-12. This may be due to households shifting to alternate sources of cooking like LPG. The percentage of household's consumption from PDS remain the same trends in rice, wheat/Atta and sugar but in kerosene it has been declined from 2009-10 to 2011-12.

Table 1: Per capita consumption and percentage of household consumption in PDS, wheat / atta, sugar and kerosene from 2004-05 to 2009-10 and 2011 across India.

Items	2004-05		% Share of PDS in Qty. Consumed	2009-10		% Share of PDS in Qty. Consumed	2011-12		Share of PDS In Qt. Consumed(%)	% of hhs Consumption from PDS during 30 Days		
	Monthly Per Capita Consumption (Kg)			Monthly consumption per capita (Kg)			Monthly Per Capita Consumption (Kg)			2004-05	2009-10	2011-12
	PDS	Other Sources	PDS	Other Sources	PDS	Other Sources	2004-05	2009-10	2011-12			
Rice	0.8	5.5	13.2	1.4	4.6	23.5	1.7	4.3	27.9	24.4	39.1	45.9
Wheat/ Atta	0.3	3.9	7.3	0.6	3.6	14.6	0.7	3.5	17.3	11.0	27.6	33.9
Sugar	0.1	0.6	9.6	0.1	0.6	14.7	0.1	0.6	15.8	15.9	27.8	33.7
Kerosene	0.5	0.1	77.1	0.5	0.1	86.3	0.4	0.1	80.8	72.8	81.8	75.6

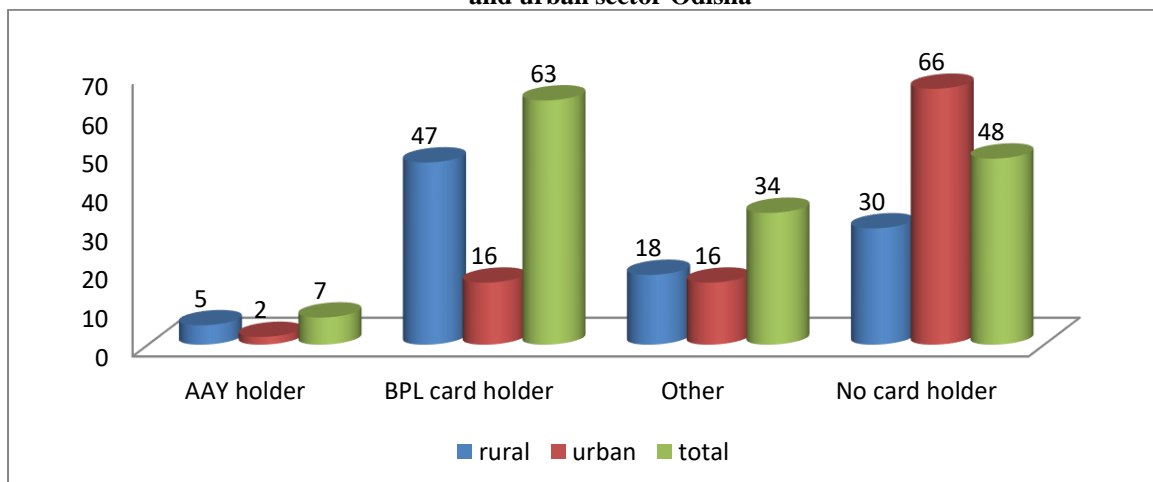
Sources: NSSO report 68 round 2011-12

Odisha is one of the predominant states of India in rice consumption (Figure No. 1). The percentage of PDS rice consumption of hhds in 2011-2012 was about 54.4% in the rural sector and the about 17.9% in the urban sector. The PDS items consumption percentage in all items in the rural sector has consumed more as compare to urban sector. The kerosene and rice has been consumed in highest percentage of households in the rural sector Odisha. As per this data the rice consumption in both rural and urban sector in Odisha is highest as compare to wheat/atta consumption.

Figure 1: Rural and urban household's difference in percentage of share in rice, wheat/atta, sugar and kerosene consumption from PDS during last 30 days in Odisha.

Sources: NSSO report 68 round 2011-12

In the rural area, ration card possession is higher as compared to urban area (Figure No. 2). Around 47% households possess BPL ration card in the rural sector Odisha which is higher than in the urban sector. There are only 5% households possessing Antyodaya ration card in rural sector and 2% in urban sector. The highest percentage of no card holders exist in urban sector i.e. 66% of households.

Figure 2: Percentage distribution of households in different type of ration card possessed in both rural and urban sector Odisha

Sources: NSSO report 68 round 2011-12

The quantity consumed and value of rice, wheat/atta, sugar and kerosene from PDS is lowest than from other sources, thus the highest average quantity consumed from PDS items was rice which is 14.96 kg and from other sources was 36.81 kg (Table No.2). The quantity consumed of wheat/atta from PDS was very few only 0.05 kg, where the amount of value was 0.53 rupees only. Lower quantity of rice and wheat were consumed from PDS as compared to from other sources. In terms of value also, households were spending very less compared to other sources.

Table 2: Quantity and value of average monthly household's consumption of rice, wheat/atta, sugar and kerosene from PDS and other sources in rural sector of Odisha

Items	Quantity Consumed (kg)				value (Rs.)			Total
	From PDS		From other sources	Total	From PDS		From other sources	
	hhs with BPL/AAY ration card	by other hhs			hhs with BPL/AAY ration card	by other hhs		
Rice	14.96	0.86	36.81	52.64	30.11	3.16	581.67	614.94
Wheat/Atta	0.05	0.67	2.19	2.92	0.53	5.55	42.79	48.87
Sugar	0.41	0.04	1.27	1.71	6.35	0.57	43.47	50.38
Kerosene	1.33	0.66	0.44	2.43	21.25	10.67	11.53	43.45

Sources: NSSO report 68 round 2011-12

Table 3: Per 1000 distribution of rural households of different social groups by type of ration card possessed in Rural Odisha

Social Group	AAY	BPL	Other	No. ration card	All
ST	46	598	76	281	1000
SC	59	539	151	251	1000
OBC	58	412	205	325	1000
Others	52	319	298	331	1000
All Odisha	54	469	177	300	1000

Sources: NSSO report 68 round 2011-12

In the rural Odisha the entire social group has possessed low Antyodaya ration card which is on 54 (5.4%) out of 1000 sample households (Table No.3). There was highest number of BPL card holder out of 1000 sample households in Odisha which is 59.8% ST, 53.9% SC and 41.2% OBC, where in all Odisha there was 46.9% BPL households out of 1000 sample households. There were only 30% households were not possessed ration card according to this data.

Per day per consumer unit of calories, protein and fat in both rural and urban area is higher than per day per capita because of the difference between households in terms of age and gender (Table No. 4). For a household without children, the two measures are therefore much closer than for a household with a high proportion of children and babies. The quantity protein and fat in urban area is more than the rural area in both consumer unit and per capita but in calories the rural household's quantity is more than urban.

Table 4: Estimation value of average intake of calorie, protein and fat in per capita and per consumer unit in Odisha

Nutrients	Per Day Per Capita		Per Day Per Consumer Unit	
	Rural	Urban	Rural	Urban
Calories	2215	2191	2750	2665
Protein	53.4	55.9	66.3	68.1
Fat	27.1	37.7	33.6	45.9

Sources: NSSO report 68 round 2011-12

The average per capita intake of calorie, protein and fat per day in rural Odisha is showing that the highest calorie intake was 2199 in 1993-1994, which has decline to 2116 in 2011-12 (Table No.5). The quantity of protein has also declined after 1993-94. There has been increased the consumption of fat from 8 to 24.4 since the year 1972-73 to 2011-12.

Table 5: Change in average per capita intake of calorie, protein and fat per day in rural Odisha

Nutrients	1972-1973 27 Round	1983-1984 38 Round	1993-1994 50 Round	1999-2000 55 Round	2004-2005 61 Round	2009-2010 66 Round	2011-2012 68 Round
Calories	1995	2103	2199	2119	2023	2126	2116
Protein	49	51	52.7	49.9	48.3	49.7	49.9
Fat	8	13	14.8	16.3	17.8	23.2	24.4

Sources: NSSO report 68 round 2011-12

The total meal of female is highest at home in both rural and urban Odisha while the number of meals in rural area is higher than the urban (Table No.6). The male population is taking highest free and payment meals as compare to female and including this entire three male are taking highest meals in rural and female are taking highest meals in urban area in Odisha.

Table 6: Average No. of meals consumed per person at home and obtain elsewhere on payment or free during a period of 30 days.

Sector	At home		Any way from home				All	
			Free		On Payment			
	M	F	M	F	M	F	M	F
Rural	80.22	80.65	3.41	2.99	0.35	0.05	83.98	83.69
Urban	69	71.7	2.42	2.3	2.31	0.67	73.73	74.67

Sources: NSSO report 68 round 2011-12

The percentage of calorie and protein are obtaining highest from cereals from both rural and urban sector households (Table No.7). The urban sector households are consuming more milk and milk products, egg, fish and meat than the rural sector according to this data.

Table 7: Percentage of total intake of calorie and protein derived from different groups

Sector	% of Total intake of calories from		% of Total intake of protein from				
	Cereals	Other food	Cereals	Pulses	Milk & milk product	Egg, fish & meat	Other food
Rural	69.7	30.3	64.8	8.8	3.3	6.6	16.5
Urban	59.6	40.4	56	9.9	7	7.8	19.3

Sources: NSSO report 68 round 2011-12

5. POLICY SUGGESTIONS AND RECOMMENDATIONS

- In Odisha, most of the PDS beneficiary households are not using kerosene to prepare their food. So kerosene should be excluded from the PDS items and it should be replaced by other food items in order to improve the household's food security (Takri & Choubey, 2022).
- The higher MPCE households are not consuming the PDS items as they are selling the PDS items to others. Therefore the government should take the right decision to eliminate such higher MPCE households group as per their income, expenditure, and other socioeconomic status.
- In Odisha, most of the people are consuming rice, so the quantity of rice should be increased and there more food items like pulses and cereals should be included as like in other states such as West Bengal, Sikkim, and Haryana to improve the household's food security.

6. CONCLUSION

High level of food insecurity and nutritional deficiency has been observed in this study in rural sector of Odisha. Over the years, percentage of household's consumption from PDS has been increasing for rice, wheat and sugar whereas there has been a decrease in case of kerosene from 2009-10 to 2011-12. Between rural and urban households of Odisha, rural households were found to have a major share in PDS consumption of all items except for a minor exception in case of wheat consumption. Also, majority of households in the rural sector possess ration cards whereas a large share of urban population does not possess such cards at all. In rural Odisha, calorie intake has seen moderate improvement from 1995 calories per capita in 1972-73 to 2116 calories per capita in 2011-12. Intake of fat has also increased significantly from 8 per cent to 24 per cent whereas protein intake has remained stagnant. Thus, provision of pulses and protein-rich foods through PDS can improve the situation. Because there are the significant deficiencies in the consumption of vegetable, pulses, milk, and their products, sugar, fruits and edible oils consumption. The overall study suggests that the PDS has positively impacted the households' food security in the region, however, it does not entirely meet the adequate calorie requirements.

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