IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 1, April 2022
Impact Factor: 6.252

Quantity Difference in the Commodities Distributed Under Public Distribution System (PDS) in Rural Kerala

Dr. Shanand K. P.
Assistant Professor, Department of Commerce
Christ Nagar College, Maranalloor, Kerala, Trivandrum, India

Abstract: *Kerala, one of the southern states in India has a renowned Public Distribution System (PDS). But due to various reasons the effectiveness of Kerala's PDS is in question. As a food deficit state affected by rise in price of essential commodities we cannot dismantle the Public Distribution System (PDS) in Kerala. Thus, the proper functioning of PDS is inevitable in Kerala to ensure regular supply and stabilize the price of essential commodities. Provision of commodities to the beneficiaries accurate as per the entitlement is necessary for ensuring the effectiveness of the PDS. There are so many complaints noticed by beneficiaries regarding quantity difference in the commodities received. Hence the study inquired with the households whether there is any difference in quantity received from the PDS.*

Keywords: Essential Commodities

I. INTRODUCTION

Food is the pedestal for every human being. Now the world has sufficient food to feast its population but millions of people still suffer from starvation around the globe. If the entire food available in the world is equally distributed it will be more than the minimum requirement for each and every person(FAO,2009). But the food is not distributed wisely, and hence a considerable number of people die every year due to starvation.

In order to improve the food security for the poor, Government of India depends on a number of policy instruments like food for work programme, employment generation programme, school feeding, Public Distribution System (PDS) etc. Among these different policy measures, the Public Distribution System is considered as the most imperative because of the population covered and the volume of transaction.

The PDS as seen today evolved through a series of transformation during its history. Alarming drought and consequent food scarcity led to the birth of this type of a food-based safety net programme in India. A step in this regard was taken by the British rulers during 1939 when the Second World War started(Mukherjee, 2011). People were faced with severe food scarcity during this period and the British Government decided to distribute food grains to the poor people in the selected cities. This Government-owned distribution system was extended to some more cities after the Bengal famine in 1943. During its initial stage the PDS functioned merely as a rationing system to distribute the essential commodities during the periods of scarcity. But later it was transformed into Fair Price Shop (FPS) which is competing with the Private traders.

In Kerala which is a food deficit state PDS, is a matter of hot discussion. The demand-supply gap in the case of rice broadened tremendously in Kerala (Karunakaran, 2013). Since the state depends heavily on other states for food grains and other essential commodities, the price increases at an alarming rate. The natural beauty of Kerala is well known in the world and the paddy field with its greenery adds to this beauty. The greenery is disappearing gradually, and Kerala is faced with a chronic food deficit situation.The area under paddy cultivation in Kerala is declining on a regular basis(Karunakaran, 2018)

Kerala has a history of a well known Public Distribution System in terms of its coverage and volume of food grains distributed(Cyriac, Sam, & Jacob, 2008). But due to various reasons the effectiveness of Kerala's PDS is in question. As a food deficit state affected by rise in price of essential commodities we cannot dismantle the Public Distribution System (PDS) in Kerala. Thus, the proper functioning of PDS is inevitable in Kerala to ensure regular supply and stabilize the price of essential commodities.

Provision of commodities to the beneficiaries accurate as per the entitlement is necessary for ensuring the effectiveness of the PDS. There are so many complaints noticed by beneficiaries regarding quantity difference in the commodities received. Hence the study inquired with the households whether there is any difference in quantity received from the PDS.

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1.1 Objectives

1. To assess the quantity difference in the commodities received from PDS
2. To examine whether the quantity difference is associated with the schemes of PDS

1.2 Hypotheses

1. There is no significant association among the different schemes of PDS with regard to the opinion about the quantity difference in the commodities received from fair price shops.
2. There is no significant difference among the different schemes of PDS with regard to the mean value of quantity difference in the commodities received from fair price shops.

III. Research Methodology

A multi-stage sampling method was employed for the selection of the sample households. The various stages involved in sampling method are given below:

1. Selection of sample districts
2. Selection of sample Fair Price Shops(FPSs)
3. Selection of sample households

There are 1905842 rural ration card holders in the three selected districts, out of which 384 households were selected as sample households by using sample size calculator (Confidence level 95%, Confidence Interval 5). Simple random sampling method was employed for the selection of sample households in the three sample districts. From each district sample households were selected proportionately.

IV. Data Analysis, Results and Discussion

4.1 Quantity Difference in the Commodities Distributed through the PDS

Provision of commodities to the beneficiaries accurate as per the entitlement is necessary for ensuring the effectiveness of the PDS. There are so many complaints noticed by beneficiaries regarding quantity difference in the commodities received. Hence the study inquired with the households whether there is any difference in quantity received from the PDS. The opinion of the households in this regard is shown in the table given below.

Table 1.0: Quantity difference in the commodities distributed through the PDS

Scheme	Yes	Percent	No	Percent	Total	Percent
AAY	20	76.92	6	23.08	26	100
Priority	98	60.87	63	39.13	161	100
NPS	62	47.69	68	52.31	130	100
NPNS	5	7.46	62	92.54	67	100
Total	185	48.18	199	51.82	384	100

Source: Survey Data

It can be observed from the above table that out of the 384 sample households 48.18 percent claimed that there are differences in the quantity received and quantity entitlement of commodities distributed under PDS. The remaining 51.82 percent of the households stated that there is no quantity differences in the commodities received under PDS.

It is clear from the above table that the quantity difference is highest in the case of AAY category and lowest for NPNS households. It is important to note that there is a higher rate of difference in the quantity of commodities received and quantity entitled in all the categories except NPNS. It is evident from the analysis that the PDS is ineffective in ensuring the beneficiaries on receiving the entitled quantity of commodities.

4.2 Association among the Different Schemes of PDS with Regard to Quantity Difference

The Chi-Square test results show the association among the different schemes of PDS with regard to the opinion about the quantity difference in the commodities received from fair price shops are presented in table 1.1

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Table 1.1: Chi-Square test results: Association among the different schemes of PDS with regard to quantity difference

Value	DF	p-value
64.678	3	.000

Source: Survey Data

Table 1.1 shows that the p-value is < 0.05 and hence the results suggest that there is significant association among the different schemes of PDS with regard to the opinion about the quantity difference in the commodities received from fair price shops. It reveals that the quantity difference in the commodities received from the fair price shops is depended on the different schemes of PDS under which the sample households are included.

4.3 Testing of Hypothesis

H_0: There is no significant association among the different schemes of PDS with regard to the opinion about the quantity difference in the commodities received from fair price shops.

The opinion of the household customers regarding the association among the different schemes of PDS with regard to the quantity difference in the commodities received from fair price shops was analysed with the help of Chi-Square test. The Chi-Square test results show that the differences in opinion of households are statistically significant at 5 percent level. Hence the null hypothesis is rejected.

4.4 Descriptive Statistics on the Quantity Difference of Commodities Distributed under PDS

Descriptive statistics such as mean, standard deviation, mean percentage and standard deviation percentage of the quantity difference in the commodities are computed. The quantity difference (kg) is computed by comparing the quantity of the commodities received by the beneficiaries and entitled quantity as per the provisions of the National Food Security Act (NFSA). The quantity of commodities entitled to different categories of households as given on the website of the Civil Supplies Department is taken into account to compute the quantity difference.

The commodities such as rice and wheat are considered for measuring the quantity difference. The kerosene has avoided while computing quantity difference because the quantity difference is insignificant as the quantity entitled is meagre. The difference in quantity received as a percentage of entitled quantity is also computed. The results of the analysis are given below.

Table 1.2: Descriptive statistics on the quantity difference of commodities distributed under PDS

	Scheme	Mean	Std. Deviation	N	Mean %	Std. Deviation %
Rice	AAY	2.269	3.093	26	8.091	11.026
	Priority	2.509	4.271	161	11.093	16.870
	NPS	0.800	1.229	130	8.840	13.248
	NPNS	0.030	0.171	67	0.846	5.265
	Total	1.482	3.126	384	8.339	14.277
Wheat	AAY	3.154	2.796	26	45.035	39.942
	Priority	1.780	2.202	161	33.224	36.386
	NPS	0.223	0.517	130	16.026	36.326
	NPNS	0.060	0.239	67	4.478	18.932
	Total	1.046	1.888	384	23.186	36.288

Source: Survey Data

It is clear from the analysis that the mean values of quantity difference in rice and wheat are higher among AAY and Priority households. As compared to rice, the quantity difference is higher in the case of wheat. Among all the categories except NPNS, there is a considerable percentage of difference in quantity received and the quantity entitled by the beneficiary households. It points out the distribution ineffectiveness of the PDS. This difference in quantity is diverted to the open market and the subsidised PDS commodities sold at market price.

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MANOVA to test the quantity difference in the commodities received from fair price shops

The MANOVA test results show the quantity difference in the commodities received from fair price shops among the different schemes of PDS are presented in table 1.3

Table 1.3: MANOVA test results: quantity difference in the commodities received from fair price shops among the different schemes of PDS

	Effect	Value	F	Hypothesis DF	Error DF	p-value
Intercept	Wilks' Lambda	.714	75.906	2.000	379.000	.000
Scheme	Wilks' Lambda	.714	23.22	6.000	758.000	.000

The Table 1.3 shows that the p-value is < 0.05 and hence the results suggest that there is a significant difference in the mean values of quantity difference in rice and wheat (F (6, 758) = 23.22, p-value < 0.05) among the different schemes of PDS.

4.5 Testing of Hypothesis

H_0: There is no significant difference among the different schemes of PDS with regard to the mean value of quantity difference in the commodities received from fair price shops.

The quantity difference in the rice and wheat received from fair price shops among different schemes of PDS is analysed with the help of MANOVA. The MANOVA test results show that the differences in quantity are statistically significant at 5 percent level. Hence the null hypothesis is rejected. Since there is a significant difference among the different schemes of PDS with regard to the mean value of quantity difference in the commodities received, the test of between-subject effects are conducted. The results are given in table 1.4.

Table 1.4: Test of between-subject effects of quantity difference

Source		Type III Sum of Squares	DF	Mean Square	F	p-value
Corrected Model	Rice	387.781	3	129.260	14.644	.000
	Wheat	355.5	3	118.500	44.599	.000
Intercept	Rice	467.439	1	467.439	52.958	.000
	Wheat	404.433	1	404.433	152.212	.000
Scheme	Rice	387.781	3	129.260	14.644	.000
	Wheat	355.500	3	118.500	44.599	.000
Error	Rice	3354.092	380	8.827		
	Wheat	1009.673	380	2.657		
Total	Rice	4585.000	384			
	Wheat	1785.180	384			
Corrected Total	Rice	3741.872	383			
	Wheat	1365.173	383			

Source: Survey Data

Test of between-subject effects was conducted to understand whether there is a significant difference in the quantity difference among the rice and wheat which are supplied through PDS. The above results suggest that there is significant difference in the mean value of quantity difference in rice (F (3, 380) = 14.644, p-value < .001) and wheat (F (3, 380) = 44.599, p-value < .001) supplied through PDS. As there is a significant difference in mean values of quantity difference in the rice and wheat among the schemes, LSD post-hoc test is used to test for the pair wise difference.

Table 1.5: Post-hoc test of quantity difference

	(I) Scheme	(J) Scheme	Mean Difference (I-J)	Std. Error	p-value
Rice	AAY	Priority	-0.240	0.628	0.702
		NPS	1.469	0.638	0.022
		NPNS	2.239	0.686	0.001
	Priority	AAY	0.240	0.628	0.702
		NPS	1.709	0.350	0.000
		NPNS	2.479	0.432	0.000

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	NPS	AAY	-1.469	0.638	0.022
		Priority	-1.709	0.350	0.000
		NPNS	0.770	0.447	0.086
	NPNS	AAY	-2.239	0.686	0.001
		Priority	-2.479	0.432	0.000
		NPS	-0.770	0.447	0.086
Wheat	AAY	Priority	1.374	0.345	0.000
		NPS	2.931	0.350	0.000
		NPNS	3.094	0.377	0.000
	Priority	AAY	-1.374	0.345	0.000
		NPS	1.557	0.192	0.000
		NPNS	1.720	0.237	0.000
	NPS	AAY	-2.931	0.350	0.000
		Priority	-1.557	0.192	0.000
		NPNS	0.163	0.245	0.506
	NPNS	AAY	-3.094	0.377	0.000
		Priority	-1.720	0.237	0.000
		NPS	-0.163	0.245	0.506

Source: Survey Data

It can be inferred from the above table that in the case of rice, quantity difference is highest for Priority households followed by AAY, NPS and NPNS households. But in the case of wheat, quantity difference is highest among the AAY households followed by Priority, NPS and NPNS households. The quantity difference in both rice and wheat is lower among the NPNS category.

An error bar is drawn to compare the mean values for each group visually. The error bar represents the variability of the data. In the graph below, the data point rounded is the mean values, and the length of the bar represents the confidence interval (95 percent). These graphs also help us to compare two values visually; if they are significantly different they will not overlap. The error bar is also given below.

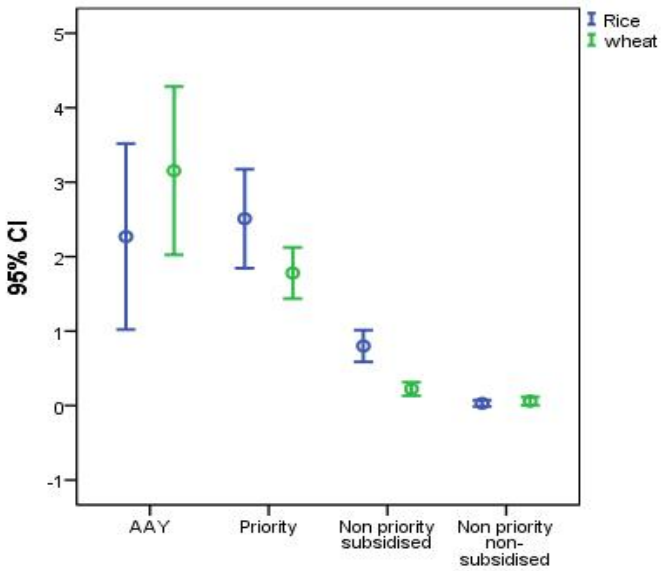

Figure 4.1: Error bar for quantity difference in rice and wheat

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V. Conclusions and Suggestions

It is evident that 48.18 percent of the households have the opinion that there are differences in the quantity of commodities received and quantity entitled. The quantity difference is highest (76.92 percent) for AAY households and lowest (7.46 percent) for NPNS households. The Chi-Square test results show that there is significant association among the different schemes of the PDS with regard to the opinion about the quantity difference in the commodities received from fair price shops. In order to avoid the problem of differences between the quantity received and the quantity entitled, the e-POS machine should be linked with the electronic weighing machine so that bills are generated for the transactions automatically only after the entitled quantity is weighed.

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