

## Public Distribution System - Sustainability and Challenges

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### Abstract

Public Distribution System (PDS) has evolved over in the 20<sup>th</sup> century. The beneficiaries access food grains through Fair Price Shops which are a crucial link in the network of PDS in India. There are total of 5,38,158 Fair Price Shops in India, meeting the requirements of distributing monthly food grains to 79.35 crore beneficiaries across India. The objective of the present research work is to study the Sustainability of PDS in the State of Goa. The required data is collected from 503 beneficiaries of PDS in the State of Goa. The sample size of beneficiaries is selected based on the proportion of total number of beneficiaries in the State from all the 12 Talukas of Goa. The Exploratory Factor Analysis and Multiple Regression Analysis are used to analyse the data. The present study will help to understand the factors contributing to sustainability of PDS from the perspective of beneficiaries.

**Keywords:** *Public Distribution System, Fair Price Shop, Beneficiary, Sustainability.*

### Introduction

The Public Distribution System (PDS) is an arrangement to distribute essential commodities through network of fair price shops to the beneficiaries across the country (Goradia & Doshi, 2015). The important task in PDS is to provide food security to beneficiaries. However, the issues such as corruption and inefficiencies hamper the system of distributing the food grains to the end beneficiaries (Tarozzi, 2005). Fair Price shops are an integral part in whole PDS network. The fair price shops enjoy commission on the monthly distribution of food grains to the beneficiaries. However, the commission provided to the fair price shop owners is negligible in comparison to cost incurred in operating a fair price shop. There is a

need to provide an all-inclusive approach to fair price shops where in the monthly footfall in form of beneficiaries can be given access to variety of services and not limited to food grains. This would help in sustaining the fair price shops in PDS and providing a much needed boost to the fair price shops which in turn can encourage fair price shop owners to provide best service to the beneficiaries.

Sustainability can be studied from the point of view of economic, environmental and social ways(Longo et al., 2023). In the present study, an attempt is made in order to study the sustainability of PDS from point of view of beneficiaries of PDS.

### **Literature Survey**

The literature survey of prior studies is undertaken to understand the work studied by earlier researchers in the area of PDS.

The outbreak of Covid-19 has led to the disruptive effects on the supply chain in PDS (Longo et al., 2023). There have been attempts made to suggest measures to reduce the food grain leakage in PDS (Singh et al., 2021).

A previous study has considered artificial intelligence as one of the popular technology and have identified 18 critical adoption barriers to India's PDS network(Sharma et al., 2021). The previous studies have also pointed out differences with respect to India's PDS at national-level and at the subnational level (Chhotray et al., 2020).

The prior studies have also made an attempt to understand the environmental sustainability and the ways in which the same has been integrated into national food policy in India(Sharma et al., 2021). The previous studies have also examined the household food security in flood-prone rural areas of India considering food security dimensions(Sam et al., 2021).

The available literature from the field of marketing and social policy related to social inclusion of migrant population is being studied during the COVID-19 pandemic (Voola et al., 2022). The previous studies have found that during pandemic, the access to food is a major challenge. A social inclusion framework is developed keeping in focus the needs of migrants as consumers and market places (Voola et al., 2022).

During COVID-19 pandemic, a study on COVID-19 lockdown and prices of essential food items of India was taken up to examine law of one price (Akber & Paltasingh, 2022). The study found that there were massive price deviations in essential commodities during the situation of COVID-19 pandemic and the law of one price did not hold true. The severe implications were faced with reference to the food security (Akber & Paltasingh, 2022). Hence, the sustainability of PDS becomes essential to continue taking efforts to ensure food security at affordable prices to the vulnerable section of the society.

### **Research Problem**

The literature survey reveals that adequate research has not been carried out with respect to sustainability of PDS.

The prior studies are been conducted in the areas of food security, nutrition security, benefits of PDS to beneficiaries, role of fair price shop owners in PDS, sustainable food distribution network, state-wise differences in PDS, artificial intelligence, disruptive effects of pandemic on supply chain of PDS and many more (Chhotray et al., 2020; Longo et al., 2023; Sam et al., 2021; Sharma et al., 2021; Singh et al., 2021; Yadav et al., 2021). However, there are no adequate studies conducted to study the sustainability of PDS.

Hence, the present research work is unique and pioneer in nature to study the factors contributing to sustainability of PDS.

### **Research Questions**

In order to address the research problem identified from the literature survey, the following research questions are framed;

What are the challenges related to the PDS?

What are the factors contributing to the sustainability of PDS?

### **Objectives of the Study**

The main objective of the present research work is to study the sustainability of PDS. However, the specific objectives of the study are;

To study the challenges related to the PDS.

To identify and analyse the dimensions of beneficiary satisfaction contributing towards the sustainability of PDS.

### **Hypothesis of the Study**

The following hypothesis is framed and tested empirically in further part of the study.

**Ho** – The dimensions of beneficiary satisfaction do not contribute significantly to the sustainability of PDS.

### **Data and Methodology**

In order to study the above stated objectives, the following research methodology has been adopted and executed.

### **Universe of the Study**

There are total of 1328324 beneficiaries of PDS in the State of Goa. Hence, the total number of 1328324 beneficiaries of PDS is considered as the Universe for this study.

### **Sample size of the Study**

For the purpose of the study, a sample size of 503 beneficiaries of PDS in Goa has been selected and studied.

### **Adequacy of Sample Size**

The sample size of 384 beneficiaries of PDS are adequate as per the Krejcie and Morgan table for determining sample size (1970) for the Universe of 1328324 respondents at 5% level of significance. Therefore, 503 beneficiaries are considered to be an adequate sample size for the present study.

### **Scope of the Study**

The study is mainly based on the perception of beneficiaries towards the sustainability of PDS.

## Sources of Data

The required and relevant data for the study is collected through both primary and secondary sources. The primary data is collected from 503 beneficiaries in PDS, from the State of Goa. The secondary data has been collected from various journals and mainly collected from the various internet resources for conducting literature survey to understand the work carried out in the area of PDS.

## Period of the Study

The period of study is the period of survey i.e. from 1<sup>st</sup> July 2022 to 31<sup>st</sup> January 2023.

## Data Analytical Tools

The collected data has been analysed by using the Exploratory Factor Analysis and Multiple Regression Analysis.

## Discussion and Analysis

With reference to the first objective of the study, the challenges in the PDS have cropped up over a period of time. In response to the challenges, the PDS has evolved drastically since its inception. The primary focus of PDS initially was to provide food security to all the beneficiaries of PDS. However, the focus has now shifted rightly to provide nutritional security to the beneficiaries. The situations such as that of pandemic have even increased the importance of PDS for the citizens of the country. The Scheme of One Nation One Ration Card has been launched accurately at a right time during the pandemic to benefit migrants who travel to different states away from their native place for earning livelihood. In addition to the continued efforts in PDS to reach out to the eligible families, one of the key challenges is to eliminate the error of inclusion and error of exclusion from PDS.

The data collected from the beneficiaries of PDS with reference to the second objective of the study is analysed by using statistical tools, namely, the **Exploratory Factor Analysis** and **Multiple Regression Analysis**.

Before applying exploratory factor analysis, the data was checked for reliability by calculating Cronbach's alpha value. Total of 17 variables (identified from exploratory factor analysis) are used in the structured questionnaire. The minimum **Cronbach's Alpha value** accepted for internal consistency of the data is 0.70. The Cronbach's value of 0.826 for 17 variables is obtained and considered strong to judge the internal consistency of the data.

Further, the adequacy of data for carrying out factor analysis is determined through **Kaiser-Meyer-Olkin (KMO) Test**. KMO values between 0.8 and 1 indicate that the data is adequate for carrying out factor analysis. The KMO value of 0.837 is calculated signifying that the data is adequate for further analysis. Three factors are identified from Table No.1 (Refer Table No.1 in the annexure) comprising of **Accessibility of Food Grains, Shop Owner Support and Quality of Food Grains**. These factors of beneficiary satisfaction are identified based on the scores of Eigen Values which are more than one, calculated by applying the statistical tool of Exploratory Factor Analysis.

These factors are analysed further through **Multiple Regression Analysis** (Refer Table No.2 in the annexure) to study the relationship between the Accessibility of Food Grains, Shop Owner Support and Quality of Food Grains and the sustainability of PDS. The three factors (derived from exploratory factor analysis), namely, Accessibility of Food Grains, Shop Owner Support and Quality of Food Grains are

considered as independent variables. These independent variables are studied with reference to the dependent variable 'Sustainability of PDS'.

Since the p-values for Accessibility of Food Grains ( $\beta=.242$ ,  $p<0.01$ ), Shop Owner Support ( $\beta=.335$ ,  $p<0.01$ ), and Quality of Food Grains ( $\beta=.443$ ,  $p<0.01$ ) are less than 0.05 at 5% level of significance, the null hypothesis  $H_0$  is rejected. Hence, it can be concluded that the dimensions of beneficiary satisfaction contribute significantly to the sustainability of PDS.

### **Discussion, Conclusion and Policy Implications**

The present research work has attempted to study the Sustainability and Challenges of PDS. The Sustainability of PDS is studied with reference of Dimensions of Beneficiary Satisfaction towards PDS. The Dimensions of Beneficiary Satisfaction in the form of Accessibility of Food grains, Shop Owner Support and Quality of Food grains supplied through PDS contribute significantly to the Sustainability of PDS.

The quality of food grains is a largest concern of beneficiaries in PDS. The beneficiaries expect the monthly quota of food grains distributed to them should meet the requirements of whole family. However, the beneficiaries get disappointed when the quality of food grains are not as per the expectations. It is recommended that the food grains distribution for each month should maintain the quality standards which would meet the dietary needs of the beneficiaries from time to time. A lapse in quality even for one month would lead to dissatisfaction of beneficiaries and thereby further creating a sense of disloyalty towards the whole PDS network.

Inorder to ensure a sustainable PDS network, the shop owner support to beneficiaries is of paramount importance. The fair price shop owners should provide individualised service to the beneficiaries wherever possible. The co-operation, help and information provided by the fair price shop owners can make the whole experience of visiting the fair price shops a convenient one to the beneficiaries. The fair price shop owners should also solve queries of beneficiaries, from time to time.

Lastly, the accessibility of fair price shops to the beneficiaries need to be ensured. There should not be any instances of beneficiaries returning from fair price shops without lifting the monthly quota due to closure of fair price shops or on account of lack of stock at fair price shops. The civil supplies inspectors and the fair price shop level vigilance committees can be instrumental in checking the day-to-day operations of fair price shops by conducting surprise visits at the fair price shops.

### **Scope for Further Research**

The present study has attempted to understand whether dimensions of beneficiary satisfaction which contribute to the sustainability of PDS. The future studies can explore the sustainable food supply chain taking into consideration the procurement, storage and distribution of food grains from farmer to beneficiary. The future studies can also focus on role of Food Corporation of India in the PDS.

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## Annexures

Table No.1

### Identification of Dimensions of Beneficiary Satisfaction towards Public Distribution System

Derived Dimensions of Beneficiary Satisfaction	Derived Factor Loadings		
	Accessibility of Food grains	Shop Owner Support	Quality of Food grains
The location of the fair price shop is within my locality.	.791		
The travel time involved in visiting the fair price shop is not burdensome.	.754		
The fair price shop can be conveniently accessed.	.720		
The staff employed at the fair price shop are approachable.	.682		
The staff employed at the fair price shop is cooperative.	.635		

There is ample space at the fair price shop for storage of food grains.	.623		
The food grains are stored in hygienic condition at the fair price shop.	.615		
Fair price shop owner extends support to me whenever required.		.843	
Fair price shop owner willingly provides necessary information to me.		.749	
Fair price shop owner reasonably handle the queries in timely manner.		.654	
Fair price shop owner provides the individualised attention to each beneficiary.		.636	
Fair price shop owner is not indifferent.		.602	
Co-operation extended by the staff at the fair price shop makes it a pleasing experience to me to visit the fair price shop.		.514	
Reasonable quality food grains are supplied through fair price shops.			.834
The arrangement of commodities is systematically done at the fair price shop.			.680
The food grains supplied through fair price shop add to my nutritional intake.			.563
<b>Eigen Values</b>	4.160	3.419	2.809
<b>% of Variance</b>	24.472	20.112	16.523
<b>Cumulative %</b>	24.472	44.584	61.107

Source: Computed from Primary Data

**Table No.2**

***Analysis of Relationship between the Dimensions of Beneficiary Satisfaction and Sustainability of Public Distribution System***

Independent Variables	Unstandardized Coefficients		t-test	P-value
	B	Std. Error		
(Constant)	3.845	.029	133.630	.000
Accessibility of Food grains	.242	.029	8.391	.000
Shop Owner Support	.335	.029	11.642	.000
Quality of Food grains	.443	.029	15.368	.000
<b>R Square .685, Adjusted R Square .467, P-value &lt; 0.05</b>				
<b>Dependent Variable: Sustainability of Public Distribution System</b>				

Source: Computed from Primary Data