



# Consumer Satisfaction with Food Grains Distributed through Public Distribution Systems in Kerala and Andhra Pradesh- An Economic Analysis

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

## Article Information

DOI: <https://doi.org/10.9734/ajaees/2024/v42i62469>

## Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/114937>

Original Research Article

Received: 01/02/2024

Accepted: 04/04/2024

Published: 16/05/2024

## ABSTRACT

The study analyzed consumer satisfaction with food grains distributed through the public distribution system in Kerala and Andhra Pradesh. A multi-stage random sampling technique was adopted for the data collection and information was obtained from 240 respondents. Percentages and Likert's Scale Technique were used to analyze the level of consumer satisfaction. The survey in Kerala and

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**Cite as:** D, V., T P, L., Thasnimol, F., A C, C., & P P, G. (2024). Consumer Satisfaction with Food Grains Distributed through Public Distribution Systems in Kerala and Andhra Pradesh- An Economic Analysis. *Asian Journal of Agricultural Extension, Economics & Sociology*, 42(6), 126–136. Retrieved from <https://journalajaees.com/index.php/AJAEES/article/view/2469>

Andhra Pradesh gauges public perceptions and satisfaction with the Public Distribution System (PDS). Key findings revealed that a notable satisfaction rate in both states regarding the quality of food grains, the helpfulness of PDS dealers, and the functioning of local outlets. While uncertainties persist regarding accessibility, regularity, and quantity sufficiency, the majority of the respondents in both states opined that PDS is significantly contributing to household food security. Respondents express contentment with billing systems, with slightly higher satisfaction in Kerala, and commend the E-POS and biometric systems. Security measures, such as biometric authentication, receive positive feedback. Overall, the survey indicates positive sentiments towards the PDS in both states, highlighting its pivotal role in ensuring food security and meeting public expectations.

*Keywords: AAY; APL; BPL; E-POS; public distribution system; PHH.*

## 1. INTRODUCTION

Ensuring access to food is crucial for the well-being of individuals, as outlined by the Food and Agriculture Organization [1]. The Public Distribution System (PDS) in India stands as a vital food security initiative established by the Government of India under the Ministry of Consumer Affairs, Food, and Public Distribution initiated in June 1997. The PDS operates in conjunction with state governments with the primary objective of distributing essential grocery items to the economically disadvantaged, specifically those possessing valid ration cards. Traditionally, the PDS entails providing food grains to individuals and families with valid ration cards, acting as a mechanism to monitor eligibility and allocate subsidized food items to those in need. Commodities, including rice, wheat grains, wheat atta, sugar, red gram, and kerosene, are distributed through a network of PDS outlets, commonly known as ration shops, established in various states across the country. Patnaik [2] described the PDS as an expression of the economic unity of the constituent states of the Indian Union. In Kerala, individuals classified as below the poverty line (BPL) cardholders are entitled to receive 35 kg of specified food grains, while those above the poverty line are allocated 15 kg of food grains according to PDS regulations. In Andhra Pradesh, families below the poverty line are eligible for 35 kg of rice or wheat per month for Antyodaya Anna Yojana cardholders, whereas households with Priority House Hold (PHH) cards receive 5 kg of food grain per unit each month. However, concerns have been raised regarding the effectiveness of the allocation process. In this context, the present study analysed consumer satisfaction of food grains distributed through the PDS system in Kerala and Andhra Pradesh.

## 2. RESEARCH METHODOLOGY

Primary data on consumer satisfaction towards food grains distributed through Public Distribution

System will be collected from the respondents using a pretested structured interview schedule. The primary data was used for analysing the specific objectives of the study by using percentage analysis, tabular analysis and Likert scale. The questionnaire consists of open-ended and close-ended questions. A form containing a set of questions was submitted to the BPL and APL cardholders to gain statistical information. Structured questions in which possible answers are suggested and they had to choose from the given options. Possibility sampling is a sampling technique, wherein the samples are assembled in a process that gives all the individuals in the population, who have equal chances of being selected. One block panchayat (mandal) will be purposively selected with maximum BPL cards from each district. From the selected block panchayat, two gram panchayaths will be selected randomly. In Kerala, from each of the two selected grama panchayaths, 30 BPL beneficiaries and 30 non-BPL beneficiaries will be selected randomly. In Andhra Pradesh, from each of the two selected grama panchayaths, 60 BPL beneficiaries will be selected randomly. Thus the total sample size of the respondents will be two hundred and forty.

## 2.1 Analytical Tools and Techniques

### 2.1.1 Likert's scale technique

A Likert scale is a psychometric scale commonly involved in research that employs questionnaires. It is the most widely used approach to scaling responses in survey research. A Likert item is simply a statement that the respondent is asked to evaluate according to any kind of subjective or objective criteria and the level of agreement or disagreement is measured and the score is given. This Likert scale technique was used for the analysis of the satisfaction of consumers towards food grains through PDS [3].

Sl. No	Response	Score
1	Excellent	5
2	Good	4
3	Undecided	3
4	Bad	2
5	Very bad	1

The Scores were summed up, and the mean of each attribute was calculated and satisfaction levels were ranked based on it. The mean score was used for a simple comparison of the level of satisfaction. The mean score was calculated by using the following formula.

$$\text{Mean score} = \frac{\sum_{i=1}^n W_i X_i}{\sum_{i=1}^n X_i}$$

where,

W<sub>i</sub>: Weight of the variable.

X<sub>i</sub>: No of respondents.

### 3. RESULTS AND DISCUSSION

#### 3.1 Perception about the Quality of Food Grains

In Kerala, 16.67 per cent of the respondents expressed an excellent opinion about the quality of food grains received from PDS, while 66.67 per cent of the respondents reported that the quality was good. About 15.83 per cent of the respondents remained undecided and 0.83 per cent of the respondents expressed their dissatisfaction with the quality of food grains. In Andhra Pradesh, only 3.33 per cent of the respondents expressed that the quality was excellent, while 60 per cent of the respondents reported that the quality of food grains was good, and 36.67 per cent of the respondents were undecided about the food grain quality. Notably, none of the respondents rated the quality of food grains as very bad (Fig. 1).

Among the 240 respondents, the majority of them (63.33%) felt that the quality of food grains was good. The mean score of the perception of ration card holders about the quality of food grains was more in Kerala (3.99) when compared to that in Andhra Pradesh (3.66).

The study conducted by Ghumaan and Dhiman [4] regarding the Public Distribution System (PDS) in Punjab disclosed the diverse

perspectives provided by the respondents on the quality of ration food grains. They rated the quality of food grains as excellent, good and bad. 53 per cent of the respondents residing from both rural and urban areas responded that the quality of food grains as excellent whereas only 17 per cent of total opined negative thus, it shows more positive side of public distribution system.

#### 3.2 Perception of Consumers about the Attitude of PDS Dealer

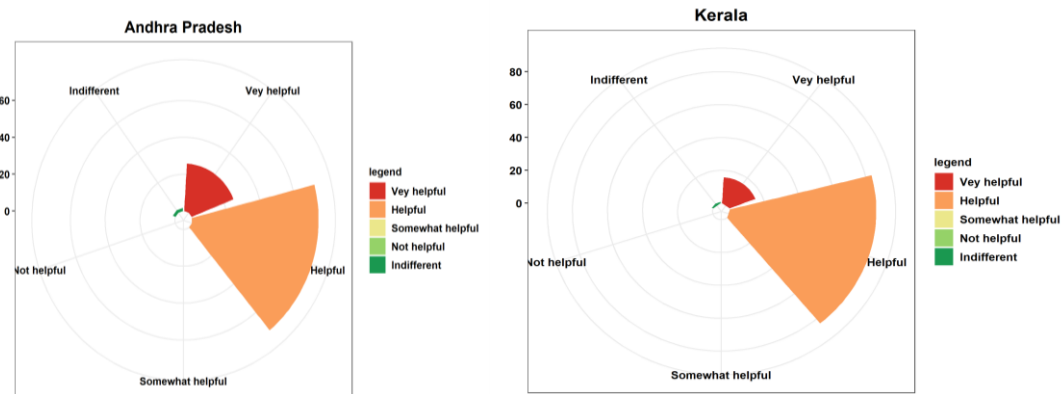
The Fig. 2 showed that in Kerala, the majority of the respondents (83.34%) expressed that the attitude of dealers was found to be helpful and 15.83 per cent of the respondents expressed that the dealers were very helpful. Only a small per cent of respondents (0.83%) were undecided about the attitude of PDS dealers. It was also noted that none of the respondents in the study area felt that dealers were somewhat helpful and not helpful. In Andhra Pradesh, 72.50 per cent of the respondents felt that PDS dealers were helpful, 25.83 per cent of the respondents felt that dealers were very helpful and only 1.67 per cent of the respondents were undecided and none of the respondents felt somewhat helpful and not helpful about the attitude of PDS dealers.

Among the 240 respondents, the majority of them (77.92%) felt helpful with the perception of consumers about the attitude of PDS dealers. The mean score of the perception of ration card holders about the attitude of PDS dealers was more in Andhra Pradesh (4.24) when compared to that in Kerala (4.12).

According to Ghumaan and Dhiman's [4] survey in Punjab, the majority of households there said that the FPS sellers were helpful overall. Out of fifty respondents from rural areas, the results showed that forty-two percent were satisfied, ten percent were at an average level of satisfaction, thirty-four percent were dissatisfied, and fourteen percent were extremely dissatisfied with the way the FPS dealer treated them. Regarding the behaviour of FPS dealers in metropolitan areas, 4 percent of respondents are extremely satisfied, 34 percent are satisfied, 24 percent are at an average satisfaction level, 4 percent are dissatisfied, and 4 percent are severely dissatisfied.



**Fig. 1. Perception about the quality of food grains**



**Fig. 2. Perception of consumers about the attitude of PDS dealer**

### 3.3 Level of Satisfaction with the Function of the Local PDS Outlet

The Fig. 3 showed that in Kerala state, 42.5 per cent of the respondents were highly satisfied with the local PDS outlet, 55.83 per cent of the respondents were satisfied and 1.67 per cent of the respondents were somewhat dissatisfied. Notably, none of the respondents were undecided and fully satisfied about the functioning of local PDS outlet. In Andhra Pradesh, 27.50 per cent of the respondents were highly satisfied with local PDS outlet, 40 per cent of the respondents were satisfied, 26.67 per cent of the respondents were undecided. Only 3.33 per cent of the respondents were somewhat dissatisfied and 2.5 per cent of the respondents were fully dissatisfied towards the functioning of local PDS outlet.

Among the 240 respondents, the majority of them (47.97%) were satisfied. The mean score of

the perception of ration card holders about the level of satisfaction with the functioning of local PDS outlet was more in Kerala (4.14) when compared to that in Andhra Pradesh (3.86).

### 3.4 Accessibility to PDS Outlet by the Respondents

The Fig. 4 showed that in Kerala, 26.67 per cent of the respondents felt highly accessible, 30 per cent of the respondents felt accessible, 43.33 per cent of the respondents were undecided and none of the respondents felt accessible with some difficulty and not accessible. In Andhra Pradesh state, 3.33 per cent of the respondents felt excellent, 35 per cent of the respondents felt good, 61.67 per cent of the respondents were undecided and none of the respondents felt accessible with some difficulty and not accessible about the accessibility of PDS.

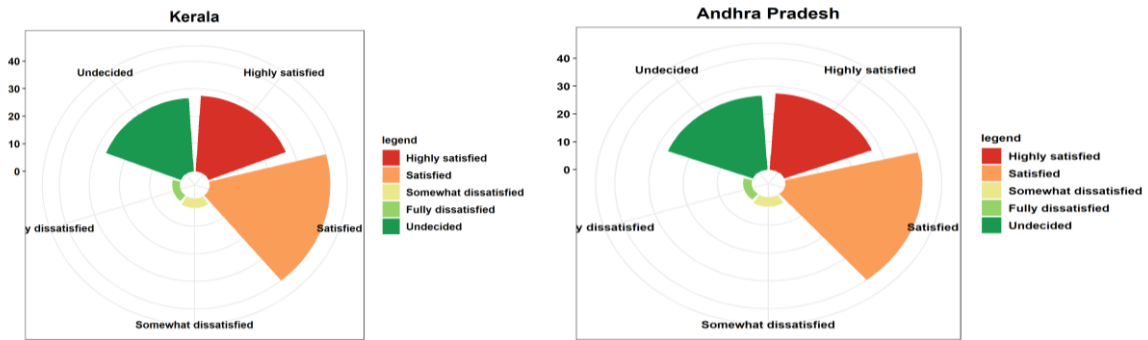


Fig. 3. Level of satisfaction with the function of the local PDS outlet

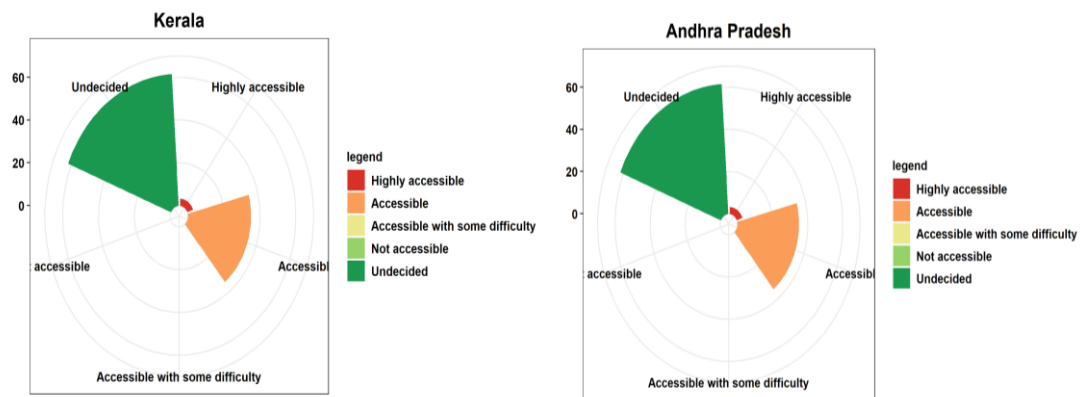


Fig. 4. Accessibility to PDS outlet by the respondents

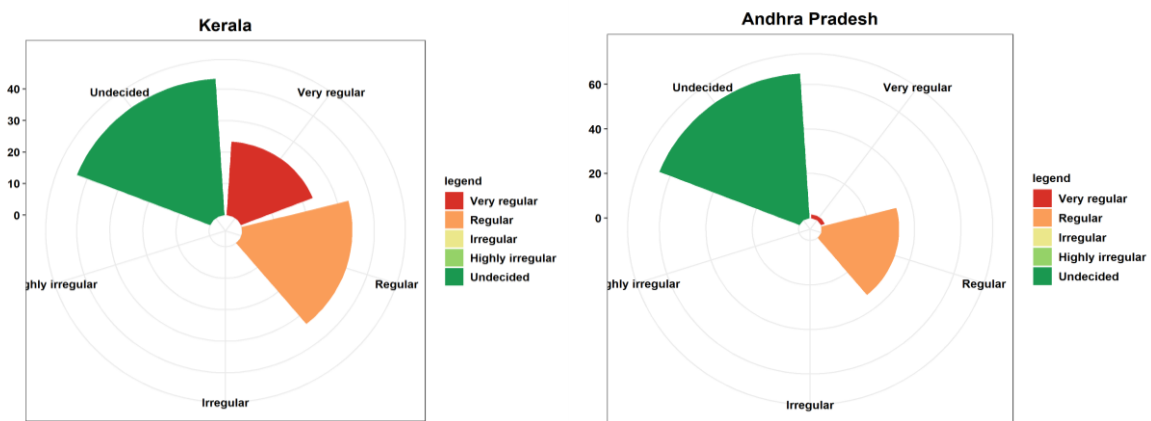


Fig. 5. Regularity in functioning of PDS outlet

Among the 240 respondents, the majority of them (52.5%) were undecided with the accessibility of PDS. The mean score of the perception of ration card holders about the accessibility to PDS outlet by the respondents

was more in Kerala (3.83) when compared to that in Andhra Pradesh (3.41).

The observations were in line with the results of the study conducted by Nair [5] in

Thiruvananthapuram district, where the accessibility of PDS of 56 per cent of respondents was better, 39 per cent of respondents felt the same, 1 per cent respondents felt worse and 4 per cent respondents felt can't say.

### 3.5 Regularity in Functioning of PDS Outlet

The Fig. 5 shows that in Kerala state, 23.33 per cent of the respondents felt very regular, 33.33 per cent of the respondents felt regular, 43.34 per cent of the respondents were undecided and none of the respondents felt irregular and highly irregular. In Andhra Pradesh state, 1.67 per cent of the respondents felt very regular, 33.33 per cent of the respondents felt regular, 65 per cent of the respondents were undecided and none of the respondents felt irregular and highly irregular about the regularity in the functioning of PDS.

Among the 240 respondents, the majority of them (54.7%) were undecided about the regularity in the functioning of PDS. The mean score of the perception of ration card holders about the regularity in functioning of PDS outlet was more in Kerala (3.82) when compared to that in Andhra Pradesh (3.36).

The observations were in line with the results of the study conducted by Nair [5] in Thiruvananthapuram district, where 29 per cent of respondents felt better, 61 per cent of respondents felt the same, 6 per cent of respondents felt worse, 1 per cent respondent

felt can't say and 3 per cent respondents felt unclear the regularity in the functioning of PDS.

### 3.6 Sufficiency of Quantity of Food Grains Supplied to Households through PDS

The Fig. 6 shows that in Kerala state, 27.5 per cent of the respondents felt highly sufficient, 22.5 per cent of the respondents felt sufficient, 50 per cent of the respondents were undecided and none of the respondents felt insufficient and grossly insufficient. In Andhra Pradesh state, 3.33 per cent of the respondents felt highly sufficient, 20.83 per cent of the respondents felt sufficient, 75.84 per cent of the respondents were undecided and none of the respondents felt insufficient and grossly insufficient about the quantity supplied to households through PDS.

Among the 240 respondents, the majority of them (62.92%) were undecided about the quantity supplied to households. The mean score of the perception of ration card holders about the regularity in functioning of PDS outlet was more in Kerala (3.77) when compared to that in Andhra Pradesh (3.27).

The observations corroborated the findings of a study by Nair [5] in the Thiruvananthapuram district, wherein 40% of respondents felt that the quantity supplied to households through PDS was better, 43% felt that it was the same, 15% felt that it was worse, and 2% felt that it was impossible to say.

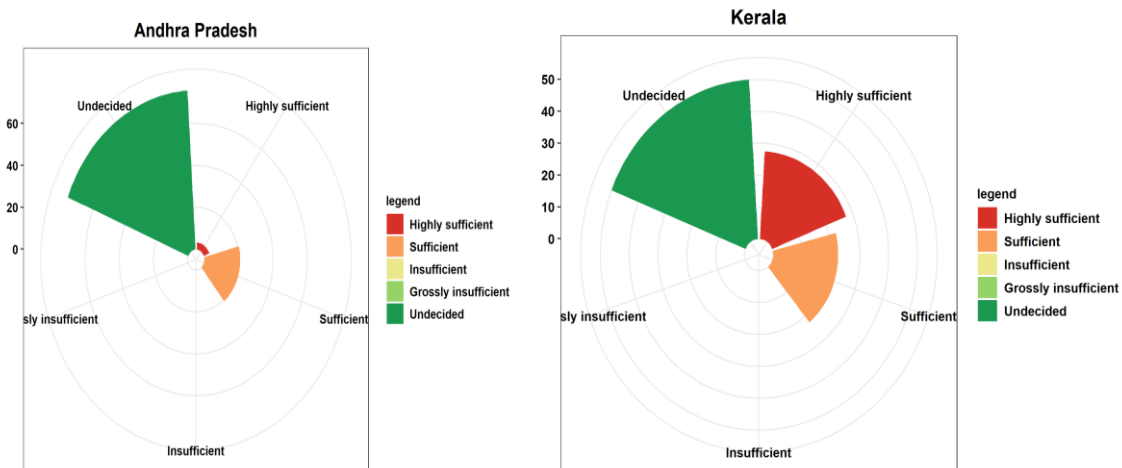


Fig. 6. Sufficiency of quantity of food grains supplied to households through PDS

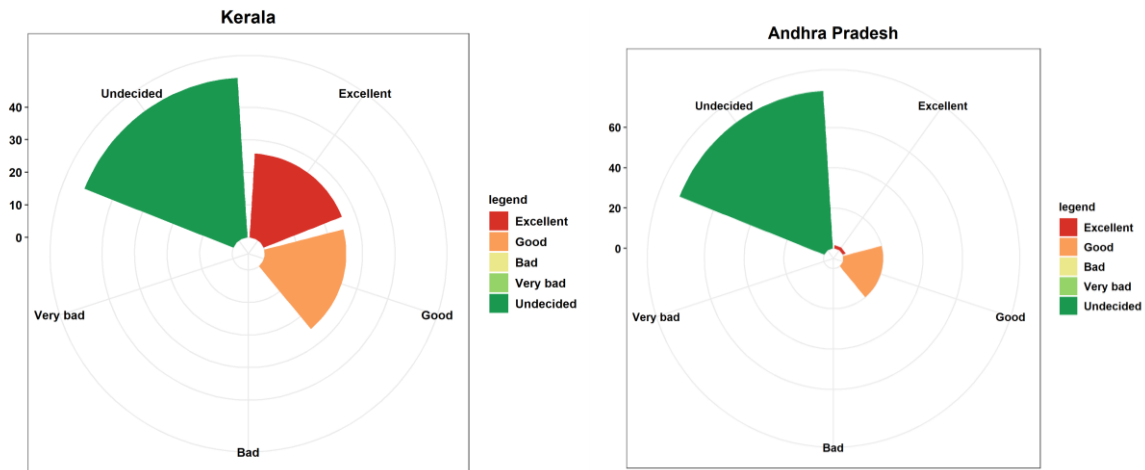


Fig. 7. Perception of respondents about the quality of food grains supplied through PDS

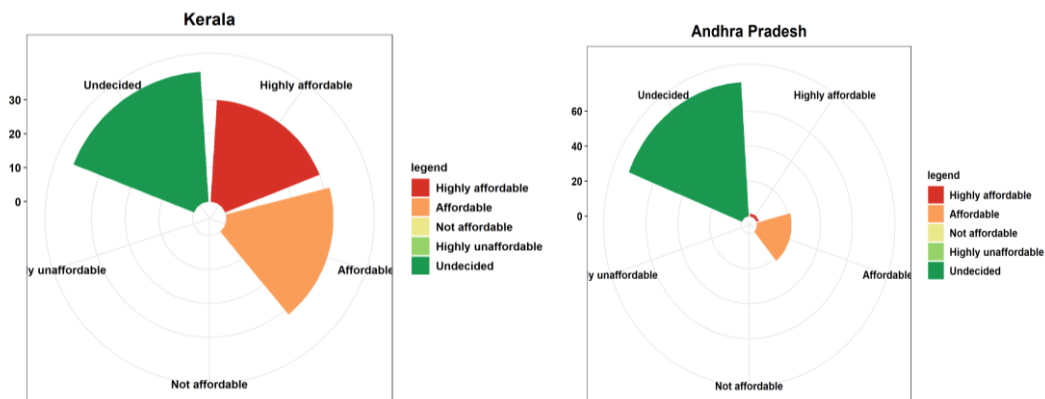


Fig. 8. Affordability of food grains supplied

### 3.7 Perception of Respondents about the Quality of Food Grains Supplied through PDS

The Fig. 7 shows that in Kerala state, 25.83 per cent of the respondents felt excellent, 25 per cent of the respondents felt good, 49.17 per cent of the respondents were undecided and none of the respondents felt bad and very bad. In Andhra Pradesh state, 1.67 per cent of the respondents felt excellent, 20 per cent of the respondents felt good and 78.33 per cent of the respondents were undecided and none of the respondents felt bad and very bad about the quality of food grains supplied to households through PDS.

Among the 240 respondents, the majority of them (63.5%) were undecided about the quality of food grains supplied through PDS. The mean score of the perception of ration card holders

about the quality of food grains supplied through PDS was more in Kerala (3.76) when compared to that in Andhra Pradesh (3.23).

The findings of Nair's [5] study in the Thiruvananthapuram district corroborated the observations, with 40% of respondents feeling better, 43% feeling the same, 15% feeling worse, and 2% feeling unsure about the quality of the foodgrains provided to households through PDS.

### 3.8 Affordability of Food Grains Supplied

The Fig. 8 shows that in Kerala state, 30 per cent of the respondents felt highly affordable, 31.67 per cent of the respondents felt affordable, 38.33 per cent of the respondents were undecided and none of the respondents felt not affordable and highly unaffordable. In Andhra Pradesh state, 1.67 per cent of the respondents felt highly



affordable, 21.67 per cent of the respondents felt affordable, 76.66 per cent of the respondents were undecided none of the respondents felt not affordable and highly unaffordable about the price of food grains supplied to households through PDS. In Kerala, felt price is high for kerosene and in Andhra Pradesh, respondents felt price is high for dal.

Among the 240 respondents, the majority of them (57.5%) were undecided about the price of food grains supplied through PDS. The mean score of the perception of ration card holders about the price of food grains supplied was more in Kerala (3.91) when compared to that in Andhra Pradesh (3.25).

Similarly, the study conducted by Ghumaan and Dhiman [4] in Punjab reveals that the majority of respondents viewed that wheat, pulses, and kerosene were available at cheap prices in the FPS.

### 3.9 Importance of PDS for Household Food Security

The Fig. 9 shows that in Kerala state, 40.83 per cent of the respondents felt very important, 55 per cent of the respondents felt important, 4.17 per cent of the respondents felt not important and none of the respondents felt less important and not important. In Andhra Pradesh state, 46.67 per cent of the respondents felt very important, 50 per cent of the respondents felt important, 3.33 per cent of the respondents felt undecided and none of the respondents felt not important about the importance of PDS for household food security.

Among the 240 respondents, the majority of them (52.25%) were felt important with the importance of PDS for household food security. The mean score of the perception of ration card holders about the importance of PDS for household food security was more in Andhra Pradesh (4.43) when compared to that in Kerala (4.28).

Similarly, in a study conducted in Arunachal Pradesh by Ramya and Ramjuk [6] where the importance of PDS for household food security in Kurung Kumey and Papum Pare districts, 50.70 per cent of respondents felt very important, 48.70 per cent of respondents felt important and 0.70 per cent of respondents were undecided in KurungKumey district and 30.00 per cent of respondents felt very important, 61.3 per cent of respondents felt important, 6.70 per cent of respondents were undecided and 2 per cent of respondents felt less important in Papum Pare district.

### 3.10 Level of Satisfaction about the Billing System

It is evident from Fig. 10 that in Kerala, 38.33 per cent of the respondents were highly satisfied with the electronic billing system, while 51.67 per cent of the respondents expressed their satisfaction and 10 per cent of the respondents were undecided. Notably, none of the respondents reported feeling somewhat satisfied and fully dissatisfied. Similarly, in Andhra Pradesh, 32.5 per cent of the respondents reported high satisfaction with the present billing system, 59.17 per cent expressed their satisfaction and 8.33 per cent were undecided. Here also, none of the respondents indicated somewhat satisfied and fully dissatisfied with the billing system.

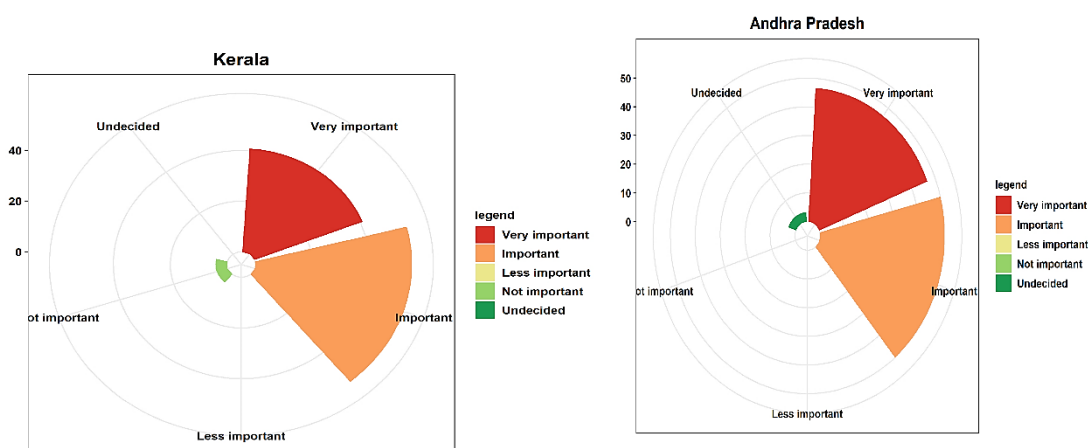
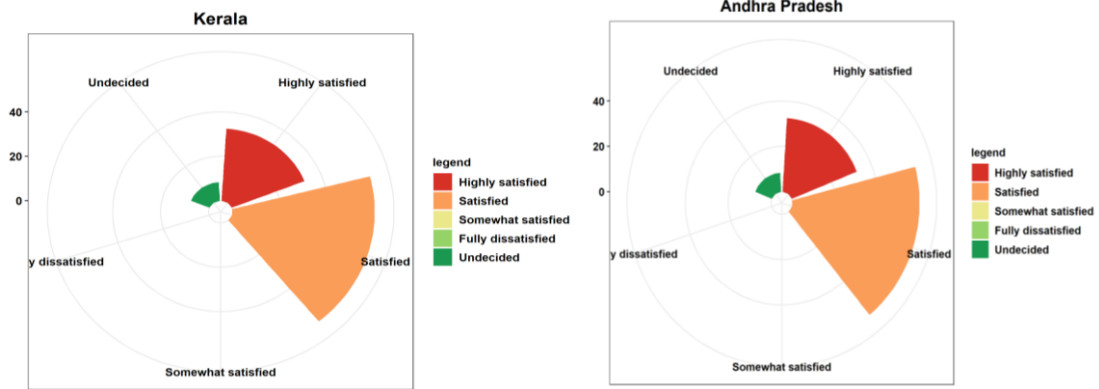
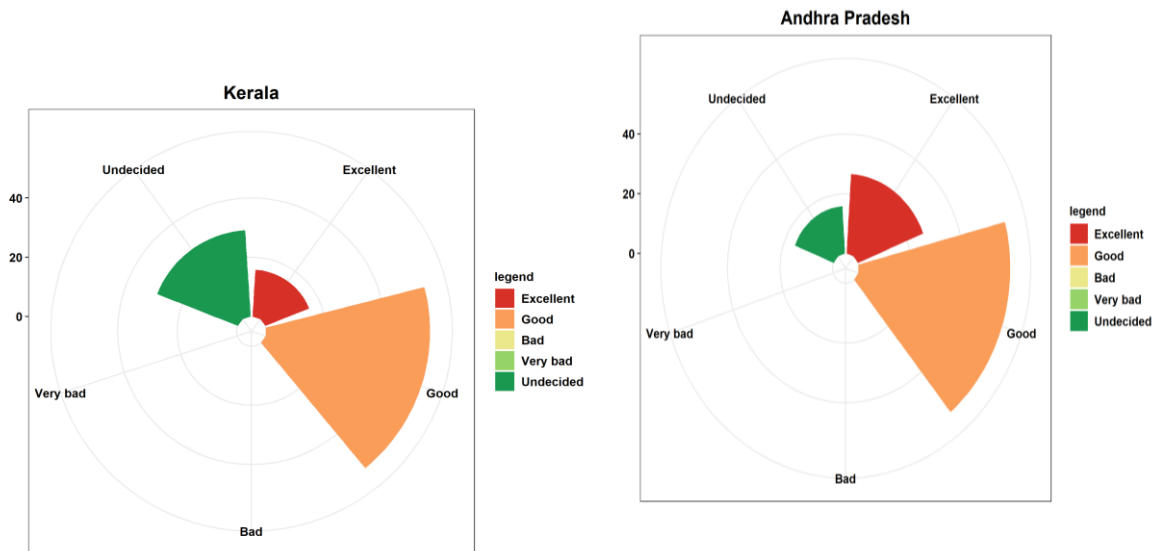


Fig. 9. Importance of PDS for household food security

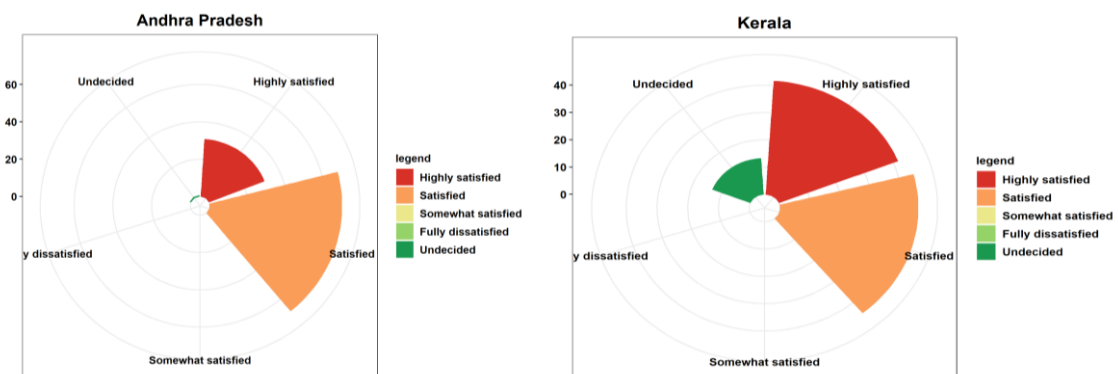




**Fig. 10. Level of satisfaction about the billing system**



**Fig. 11. Opinion of respondents regarding the use of the biometric billing system**



**Fig. 12. Overall satisfaction in E-POS system**

Among the 240 respondents, the majority of them (55.42%) were satisfied with the level of satisfaction on the billing system. The mean score of the perception of ration card holders about the level of satisfaction about the billing was more in Kerala (4.28) when compared to that in Andhra Pradesh (4.24).

Similarly, a study conducted in Palakkad district by Suryakrishna [7] observed that 28 per cent of respondents were highly satisfied with the billing system in the PDS outlets, 36 per cent respondents were satisfied, 36 per cent of respondents were neutral and 8 per cent of respondents were dissatisfied.

### 3.11 Opinion of Respondents Regarding the Use of the Biometric Billing System

The Fig. 11 shows that in Kerala state, 15.83 per cent of the respondents felt very excellent, 55 per cent of the respondents felt good, 29.17 per cent of the respondents were undecided and none of the respondents felt bad and very bad. In Andhra Pradesh state, 26.67 per cent of the respondents felt excellent, 57.5 per cent of the respondents felt good, 15.83 per cent of the respondents were undecided and none of the respondents felt bad and very bad about the use of a biometric billing system. After the biometrics system came outsiders of family are not allowed to take ration from FPS shops.

Among the 240 respondents, the majority of them (56.25%) felt good regarding the use of the biometric billing system. The mean score of the perception of ration card holders about the opinion of respondents regarding the use of the biometric billing system was more in Andhra Pradesh (4.10) when compared to that in Kerala (3.86).

In a similar vein, 70% of respondents to a survey by Suryakrishna [7] in the Palakkad district felt positively about the use of the biometric billing system, 6% felt neutrally about it, and 24% felt negatively about it.

### 3.12 Overall Satisfaction in E-POS System

The Fig. 12 shows that in Kerala state, 41.67 per cent of the respondents were highly satisfied, 45 per cent of the respondents were satisfied, 13.33 per cent of the respondents were undecided and none of the respondents felt somewhat satisfied and fully dissatisfied. In Andhra Pradesh state,

30.83 per cent of the respondents were highly satisfied, 68.34 per cent of the respondents were satisfied, 0.83 per cent of the respondents were undecided none of the respondents felt somewhat satisfied and fully dissatisfied about their overall satisfaction with the E-POS system.

Among the 240 respondents, the majority of them (56.67%) were satisfied with overall satisfaction in the E-POS system. The mean score of the perception of ration card holders about the overall satisfaction in the E-POS system was more in Andhra Pradesh (4.30) when compared to that in Kerala (4.21).

In a study carried out in the Palakkad district by Suryakrishna [7], 42 percent of participants expressed high satisfaction, 36 percent expressed satisfaction, 20 percent expressed neutrality, and 2 percent expressed dissatisfaction with the E-POS system's overall level of satisfaction.

## 4. CONCLUSIONS

The survey conducted in Kerala and Andhra Pradesh indicates that the Public Distribution System (PDS) is generally well-received by respondents in both states. In Kerala, an overwhelming majority of 83.34% expressed satisfaction with the quality of food grains, while 99.17% found PDS dealers helpful, and 98.33% were satisfied with local outlet functioning. In Andhra Pradesh, 63.33% of respondents expressed positive views on food grain quality, with 98.33% finding PDS dealers helpful and 97.5% satisfied with outlet functioning. The respondents from Kerala (48.33%) and Andhra Pradesh (24.50%) responded regarding the uncertainty regarding the sufficiency of quantities supplied through PDS. Moreover, uncertainty prevailed in both states regarding the affordability of food grains, with Kerala indicating higher levels of uncertainty. The respondents in Kerala perceived that prices were high for kerosene, while in Andhra Pradesh, prices were perceived as high for dal. However, common concerns were noted in both states regarding accessibility, regularity of functioning, quantity sufficiency, and affordability, with Kerala showing higher uncertainty levels. Despite these concerns, respondents in both states recognized the crucial role of PDS in household food security. Satisfaction rates with billing systems, E-POS systems, and biometric billing were generally high, with Kerala showing slightly higher satisfaction. Measures like the biometric system to restrict unauthorized access reflect efforts to

enhance system integrity. Overall, while areas for improvement were identified, the survey underscores the positive perception of PDS in both states, emphasizing its vital role in ensuring food security and meeting respondents' expectations. Moreover, a considerable percentage in both Kerala and Andhra Pradesh were undecided about the regularity of PDS functioning. Thus, the efficient management of the Public Distribution System (PDS) in Kerala and Andhra Pradesh requires improvements in accessibility, supply regularity, quantity sufficiency, affordability, and technology infrastructure. Strengthening these aspects, along with price control measures and community engagement, can ensure a streamlined and effective PDS that caters to the needs of eligible beneficiaries in both states.

## 5. SUGGESTIONS

The ration card holders in Kerala requested to change their APL to BPL status on ration cards which is due to their lower income or financial status. The APL card holders in Kerala were receiving only one commodity *i.e.* rice, an increase in the variety of commodities provided through the ration system helps in meeting the dietary requirements and improve the overall food security. In addition to this, the respondents from Andhra Pradesh suggested to increase the number of commodities available to each family. The suggestions made by the respondents from both the states were to increase the quantity and improve the quality of food grains along with creating an awareness regarding the ratio allowed to the family members and making the product available by time.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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