Rajagiri Journal of Social Development
Volume 5, Number 2, December 2013

Household Food Security: Below Poverty Line (BPL) Families in the Coastal Areas of Cochin

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Abstract

The public distribution system (PDS) in Kerala is known for its extensive coverage. The objective of this study is to assess the household food security status of people living below the poverty line (BPL) and its impact on the health of women and children in the selected coastal areas of Kochi in Kerala. Household food security was assessed using a food security core module questionnaire on 500 BPL families in coastal Kochi. The utilization of PDS, nutritional status and diet pattern of women and children 3-6years (sub sample 37) were studied. The results showed that PDS was best utilized by the majority. Poor quality of rice and inadequate quantity of commodities such as sugar forced the respondents to buy from the open market. Only 43% families were food secure, and the case of the rest of them food insecurity levels varied from no hunger to severe hunger. Significant differences in weight and height of children and the levels of food security were found. The study revealed the current food security status and identified the short comings in PDS. It shows the importance of PDS in ensuring food security and thereby good health for women and children.

Keywords

food security, BPL, PDS, nutritional status, kerala

Introduction

Though food production has increased more steadfastly than the population, hunger still persists in many parts of the world. Today more

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than one billion are very poor and are suffering from hunger and almost 870 million are chronically malnourished and a vast majority of these people live in the developing countries (FAO et al., 2012). While famine and starvation deaths remain common problems of hunger, the most significant concern is that of a lack of chronic or persistent food and nutritional security. The Global Hunger Index (International Food Policy Research Institute) ranking 85 countries on three indicators, child under nutrition, under 5 mortality and proportion of population with calorie deficiency, finds India at the 65th place (Grebmer et al.,2009). The severity of hunger situation in Kerala is 'serious,' which is better than the grade 'alarm' received by many other Indian States like Madhya Pradesh, Bihar and Jharkh and (Menon et al., 2008).

FAO (2003) defines food security as physical and economic access to sufficient, safe nutritious food to meet the dietary needs and food preferences of all people at all times. Food security encompasses not just the quantity of food, but also access and utilization of it. Both play a noteworthy role in understanding the vulnerability of women and children. India has become self sufficient in food grains during the last thirty years. Yet, good buffer stocks have failed to impress as millions of tonnes of food grain are rotting in godowns while hundreds of millions of people do not have enough to eat. Food grains are lying in the open for years because of inadequate storage capacity. Admittedly in 2011 about 55,000 tonnes of food grains rotted in Punjab and Haryana alone (Venkatesan, 2011).

In order for food security to be meaningful food must not only be available at the higher levels, but be accessible at the lowest unit, the household and indeed every single member within it (Dev, 2003). PDS is a major programme of the Government of India for ensuring food security. The coverage of PDS at its inception was universal with no income discrimination. Over time, inadequate targeting and severe leakages have limited its coverage affecting the food security of the needy. India has achieved food security at national level but household and individual food security is still doubtful (Athreya et al., 2009). Women in India have a major role in ensuring food security at household and individual levels, while their own security with reference to adequate nutrition remains debatable. The gender gap index of the IFPRI that compares global hunger and gender inequality suggests a negative relationship in the health sub index indicating that the higher the gender inequality, then the higher the levels of hunger (Grebmer et al., 2009). Mothers sacrifice their own health

and nutritional intake for their children to shelter them from the negative consequences of not having enough food (Hamelin et al., 2002; Kempson et al.,2002).

Kerala is known as a 'food deficit State' in India because of the wide gap in the consumption and production of food grains especially rice, which is the staple diet of the population (Kannan, 2000). The network of PDS can play a more meaningful role only if it ensures the availability of food to the poor households. Kerala has taken a complete reversal in the utilization of the PDS from a scenario where majority depended on PDS to where 70% are excluded from the system completely(Cyriac et al., 2008). Hence an effort in this regard was done to study the household food security status and its impact on maternal and child health with the following objectives:

- To assess the household food security of people living BPL in coastal areas of Kochi
- To study the utilization and effectiveness of PDS
- To assess the availability and accessibility of essential commodities especially food supplies
- To study the impact of food security on nutritional status of women and children

Data and Methods

Kochi is characterized by small and large islands scattered in the area within the Vembanad Lake. Kochi Corporation, surrounding municipalities and panchayats constitute the City Development Plan area of Kochi with a total BPL population of 34%. The percentage of population below poverty is reported to be still higher in the coastal areas, where fishermen constitute a major share of the population (Varughese, 2010). Hence, the study was conducted in the coastal areas of Kochi among BPL families who were chosen by stratified random sampling. In the first strata, all coastal wards in Kochi were considered from which 10 wards (Chellanam, Kannamaly, Malippuram, Puthuvype, Fort Kochi, Kalvati, Eravali, Karippalam, Mattanchery and Cherai) were randomly selected. It was decided to survey 50 houses in each of the selected ward for equal distribution totalling 500. Households that were accessible at the time of visit were included. In order to verify the socio economic status the respondents were asked to produce their ration cards. Only BPL families holding pink colour ration card were chosen for the study. Survey in each of the selected ward ended

with the 50th BPL household. In case of an APL (above poverty line) household or the house being locked at the time of visit, the investigator moved to the next until a household that met the inclusion criteria was reached. The study conducted in 2011-12 surveyed 500 BPL households, out of which 15 was omitted due to incongruent information given by the respondents. The responses of women in the household were taken as they were the chief persons involved in food preparation and intra familial meal distribution.

Household food security status was assessed using the validated food security core module questionnaire (Bickel et al., 2000) in which response was collected by a face to face interview with all the selected respondents. A set of 18 questions were used in the module provided indicator variables that underlie standard measurement scale for severity of food insecurity and hunger. The questions measured the anxiety of respondents regarding inadequate food supply, poor food quality and reported instances of reduced food intake of adults and children. The questions covered situations of food inadequacy. The answers ranged from 'never true,' 'often true' to 'do not know.' The household food security status was classified based on the number of affirmative responses given, as food secure, food insecure without and with hunger (Table 1).

Table 1
Classification of household food security status

Number of affirmative responses	Classification
0-2	Food secure
3-7	Food insecure without hunger
8-14	Food insecure with moderate hunger
15-17	Food insecure with severe hunger

A self formulated questionnaire was used for gathering information regarding demographics, patterns of food consumption and utilization of public distribution services. Data was also collected on open market dependency, its frequency and reasons.

From among the 500 households surveyed, a sub sample of 37 non pregnant, non lactating mothers with children aged between 3-6 years were interviewed to know the impact of food security on their nutritional status. The children (3-6 years) of the selected mothers were also included to

study their nutritional status. Nutritional assessment was conducted with the measurements of body weight, height, mid arm circumference and waist-hip ratio. The Body Mass Index (BMI) was computed to assess grade of malnutrition as shown in Table 2. A 24-hour diet recall and nutrient intake was calculated to know the sufficiency of diet.

Table 2
Grades of Body Mass Index

BMI Class	Presumptive Diagnosis
< 18. 5	Chronic energy deficiency
18. 5 – 20	Low normal weight
20 - 25. 0	Normal
> 30. 0	Obese

Results

As shown in Table 3, the ration card was issued in the name of the male member in 51% of the families, more than half were Christians (66. 8%) and lived in nuclear families (68. 8%). The family monthly income of majority of the respondents was in the range Rs. 3,000-5,000. Fishing was the primary occupation. Few of them who engaged in fishing remained jobless for nearly three months during the rainy season when fishing activities were low, while majority took up some other jobs like painting, carpentry and head loading. Almost all of them had proper toilet facilities with good drainage system, waste disposal, electricity connection and drinking water. Easy access to health care facility was also reported by the respondents.

Utilization of Public Distribution Services (PDS)

The results of the study indicate a very good utilization of the PDS in this region with about 84% being regular users of the service. Also more than half (59%) had easy access to the rations with Fair Price Shops (FPS) within 1 km radius and for 23% within 2 kms. This shows the wide distribution and settlement of FPS within easy reach. This result is concurrent with the fact that the PDS is a widely distributed welfare system for the public. Specific quantities of rice, wheat and other essentials like sugar and kerosene were also distributed. Most of the study respondents (60%) made a weekly purchase of commodities from the FPS and 28% purchased rations once a month. As wheat is not a preferred food item in Kerala the purchase of wheat was found to be less (51%). Though rice is

the staple cereal consumed, only 63% sourced it through the PDS. The mean quantity of rice, wheat and sugar purchased per month was 19 kg, 3 kg and 2 kg respectively. Majority of the respondents felt that the quantity of rice and wheat was sufficient. Yet, many restrained from purchasing cereal grains due to the poor quality.

Table 3
Background information of respondents

Criteria	% (n)
Ration card Holder	
Male	51 (247)
Female	49 (238)
Religion	
Hindu	25. 6 (124)
Christian	66. 8 (324)
Muslim	7. 6 (37)
Type of family	
Nuclear	68. 8 (334)
Joint	31. 2 (151)
Number of members in the family	
2-4	44. 8 (217)
4-6	40. 8 (198)
6-8	10 (49)
> 8	4. 4 (21)
Monthly Income (Rs)	
<1000	2 (10)
1001-3000	20 (98)
3001-5000	26 (126)
5001-7000	22 (106)
< 7001	30 (145)

Open Market Dependency

Of all the PDS users, only 37% agreed that the quantity of rations given through the PDS was sufficient to meet their family requirements, while a majority (62%) answered in the negative. A family is entitled to 2 kgs of sugar a month which majority (92%) felt hardly met their monthly needs. Rice is a staple cereal in the region and 48% voiced that the quantity of rice was insufficient, followed by wheat (19%) and kerosene (17%).

Insufficient quantity of rations forced people to depend on open markets for purchase of essential food commodities. About 86% of the study subjects also purchased these commodities from open markets exposing them to severe market fluctuations and price rise. Most of the respondents bought rice and sugar while a few also bought wheat and kerosene from open markets. Nearly 73% reported unavailability of sufficient stocks at all times to be the reason for open market purchase. However 26% also complained of poor food quality (Table 4).

Table 4
Open market dependency

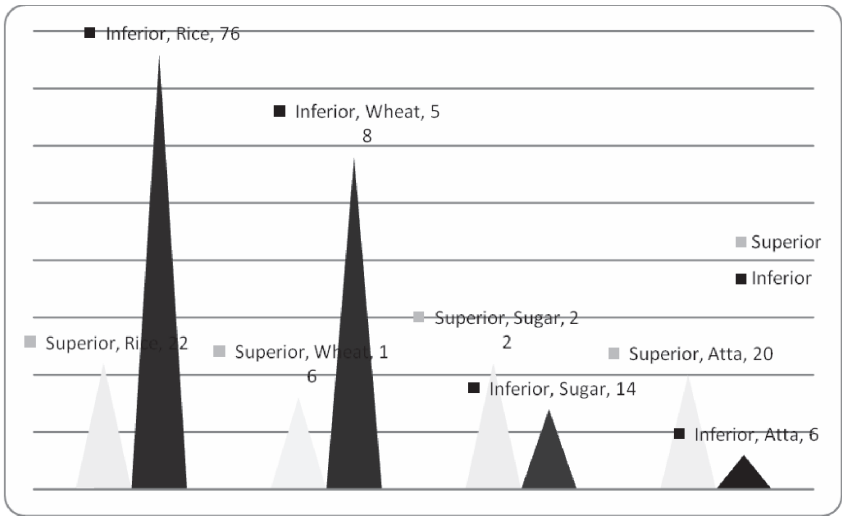
Parameters	Groups	Percent
Sufficiency of food items from PDS	Yes	37.3
	No	62.7
Items insufficient *	Rice	47.9
	Wheat	19.8
	Sugar	53.7
	Kerosene	17.9
Purchase from open market	Yes	86.1
	No	13.8
Source of Open market purchase	Triveni Store	2.0
	Supply co Maveli Store	62.0
	Margin Free Store	10.0
	Super Market	4.0
	Departmental Store	56.0
	Other Shops	24.0
Items purchased from open market *	Rice	59.7
	Wheat	21.6
	Sugar	68.7
	Kerosene	16
Reasons for purchasing from open market*	Poor quality of foods in PDS	26.3
	Unavailability	73

* Multiple responses

Quality Aspects of PDS Food supplies

The quality of cereal grains was rated as superior, inferior and inedible on a scale of 1-3. Rice (76%) and wheat (58%) were rated as inferior. Only about 20% of the subjects rated the commodities superior as shown in Figure 1.

Figure 1
Quality of raw food commodities distributed by PDS



The presence of physical impurities like stones, mud/dust and insects indicates poor food quality. Poor quality was also one of the major reasons cited for depending on open markets and 82% of the subjects reported the presence of physical impurities. Stones and black rice were impurities reported in rice. Cereal grains were often infested (Table 5).

Table 5
Common impurities seen in food stuffs

Food stuffs	Stones	Insects	Mud/Dust	Black Rice
Rice	66	34.0	16.0	42.0
Wheat	6.0	40.0	48.0	–
Sugar	–	–	14.0	–
Atta	–	2.0	–	–

The poor quality of raw foods when cooked affects the end product quality. The common problems encountered in the quality of the cooked

product are shown in Table 6. Stickiness (76%), bad odour (32%) and long cooking time (34%) were the problems reported in the cooked quality of rice while a few (16%) reported bitterness in wheat when cooked.

Table 6
Quality of cooked products

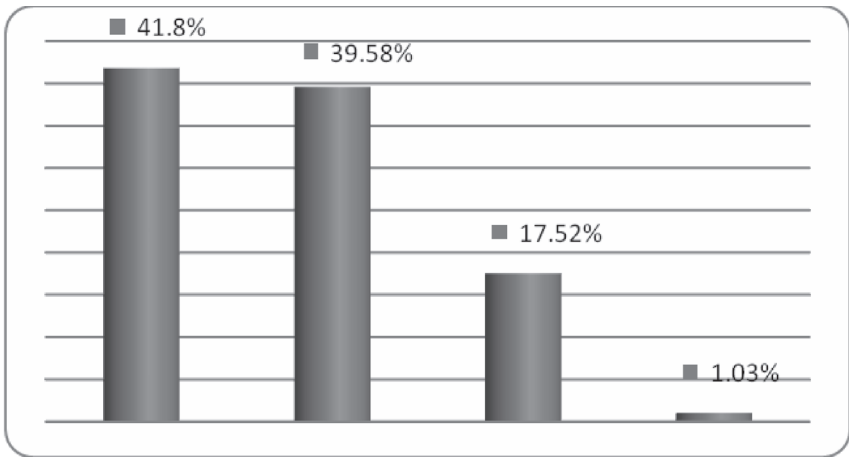
Food stuffs	Stickiness	Bad Smell	Long cooking time	Bitterness / Softness
Rice (48)	38 (76. 0)	16 (32. 0)	17 (34. 0)	–
Wheat (9)	–	–	–	8 (16. 0)

Note: Percentage in parenthesis.

Household Food Security

It was found that only 42% of the households were food secure. More than half of the respondents, i. e. 58%, were food insecure with varying degrees of insecurity. However, 39% of households that reported food insecurity did not report hunger. Food insecurity with moderate hunger was reported in 17% of the study population and only 1% reported starvation with severe hunger.

Figure 2
Household food security status



Nutritional Impact of Food Security

Tarasuk (2009) found that both adults and children in food insecure households consumed far fewer servings of fruit, vegetables and milk than

those in food-secure households. Since long term calorie deficit can affect the nutritional status, it was hypothesised that a difference in nutritional status of women and children in food insecure families will be seen. On computing the BMI of selected women, it was found that the incidence of chronic energy deficiency increased with increased levels of food insecurity that was statistically insignificant. Che and Chen (2001) also reported in a 1998/ 1999 Canadian National Population Health survey that 17 percent of those women who were food insecure had poor or fair health, compared to seven percent of food secure women. In addition to thepooreroverall health, it was found that those people who were food insecure also suffer from higher rates of disease likeheart disease, obesity, high blood pressure, and diabetes (Che and Chen, 2001; Drewnowski and Specter, 2004; Olson et al.,2007).

In the current study, among children from food insecure severe hunger families, all showed stunting indicating long term starvation. Stunting, unlike weight loss occurs due to insufficient food intake over a long period of time. Eighty-four percent of respondents belonging to food secure families were found to have normal weight for age.

The post hoc test proved the hypothesis positive as there exists a significant difference in the weight and height in the age of those children between food insecure families with severe hunger and other levels of food security (Table 7). This indicates that children who belonged to food insecure families with severe hunger had low height and weight for their age when compared to children from other levels of food insecurity. This shows the lag in the growth parameters of children from food insecure families suffering from severe hunger. This trend is also voiced in a study by Hackett et al. (2009) where statistically significant associations between household food insecurity and diagnoses of children's diseases ($p < 0.0001$) existed. He also noted that the risk for child stunting and underweight increased in a dose–response way as food insecurity became more severe. Tarasuk (2009) also concluded that nutrient intake of protein, fibre, vitamins A, B and C and few minerals varied significantly among children in food secure and food insecure households. Vijayakumar et al. (2007) assessed the food security profile of Adi Dravidar women in urban, rural and tribal areas in Salem district, Tamil Nadu and concluded that 80% were food insecure with moderate hunger and 6% reported severe hunger. However the study did not compare disparities in nutritional status among food security levels.

Summary

The present study revealed that food insecurity still persists among the poor population in the coastal areas of Kochi. The higher the level of the

Table 7
Multiple comparison of difference in mean anthropometric indices within food security levels

Variables	Food insecure with severe hunger		
	Food secure	*Food insecure without hunger*	*Food insecure with moderate Hunger*
BMI of women	0.1579	0.3333	*1.0000*
Weight for age	1.6842 ***	1.*5556**	*1.8571* ***
Height for age	1.2368 ***	1.3889 ***	1.3571 ***

Notes: *** Significant at 1% level, and * Significant at 5% level

food insecurity the more vulnerable and malnourished women and children are. Children belonging to food insecure families with severe hunger had low height and weight for their age. A better utilization of PDS was observed during the study but problems like insufficiency and poor quality of supplies marred its effectiveness exposing the poor to the high prices of the commodities in the open market. Improvement in food availability, access to and reach of health services, proper care of children, and better education for women are the keys for future progress in mother and child nutritional status.

Moreover, the predominance of cereals and lack of adequate pulses, oil, fruit and vegetables in the diet of most Indians is what causes high levels of malnutrition among them. Therefore, to address the problem of malnutrition, the availability of all these items should be sold through the PDS. The problems of lack of stocks and poor quality of grains in the PDS should be addressed and the PDS effectively managed to ensure food security.

Acknowledgement

This study is a part of minor research project funded by the University Grants Commission (UGC), India.

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