

## **Household-level Food Security and Coping Strategies: A Study on Squatter Settlement of Urban Area**

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**Objectives:** India achieved success to combat with transient food insecurity, although it failed to fight with chronic food insecurity as reflected in the low energy intake and high incidences of malnutrition. Present study aimed to determine households level food security; explore the determinants and coping strategies of such incidents.

**Methods:** The present study population was selected from squatter settlement of Bagbazar khal, North Kolkata, metropolitan city of West Bengal, India. Data was collected from women, who were largely responsible for handling the food preparation and food distribution within the household. Data were collected on socio economic aspect and consumption behaviours. Consumption behaviours can be measured through Coping Strategies Index and The Household Food Insecurity Access Scale.

**Results:** One fifth sections of them were food secure. However, majority of households have experienced severe food insecurity followed by moderate and mild insecurity. An overwhelming sections were not able to eat preferred food and have to take limited variety of food due to lack of their resources. Monthly household income found to be a significant factor of food insecurity.

Participants adopted severe food coping strategies like consume less preferred, less expensive food and reduce number of meals eaten in a day.

**Conclusion:** Food insecurity in slum and squatter settlement areas of urban is the result of absence of agricultural productivity, owing to inadequate resources, extremely low literacy rate and lack of job opportunities.

**Keywords:** households level food security, squatter settlement, consumption behaviour.

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## **Introduction**

The concept of food security defined by World Food Summit in 1996 reflects three key dimensions: (1) food availability and accessibility (2) biological utilization of food and (3) the stability of food status (FAO 2006). Food availability can be described as the extent to which food is within the reach of households both in terms of sufficient quantity and quality (FAO 2006). At household-level food access is considered to be achieved when a household has the ability to obtain the food of sufficient quantity and quality which ensure safe and nutritious diet (FAO 2006). Income generating activities and food production possibilities are the major determinant of the ability of households to purchase food (Renfu et al. 2012). Moreover, at present food security concerns include biological utilisation of consumed food (Aidoo, Mensah, and Tuffour 2013). Moreover, availability to take safe drinking water, sanitation practice as well as nutritional intake and knowledge can help or hinder the absorption of food into the body. It will form the more inclusive conception of food security (MSSRF and WFP 2008).

Worldwide around 795 million people were undernourished. However, the prevalence of undernourishment has decreased from 18.6 percent in 1990–92 to 10.9 percent in 2014–16 (McGuire 2015). The proportion of hunger population is greater in developing countries (McGuire 2015). In India food insecurity exists at the household level for millions of people, more so among socially and economically deprived groups and backward and remote regions (Xaxa 2014; Das and Saha 2016). However, India achieved success to combat with transient

food insecurity, although it failed to fight with chronic food insecurity as reflected in the low energy intake and high incidences of malnutrition (Ahlawat and Kaur 2013). National level data shows that here, about 35 per cent of children (<5 years) are underweight, 38.4% and 21% of them are stunted and wasted respectively. Micronutrient deficiencies are common, such as 54.2 % of women aged 15-49 years, 25.2% men of this age and 58.5% children aged 5-59 months are anaemic (IIPS 2015). Other factors that affect food and nutrition security include access to safe drinking water and toilets within the premises (MSSRF and WPF 2008).

In India there are few studies on food security (Xaxa 2014; Das and Saha 2016; Chyne et al. 17). But none of them try to find out the various factors that determine the status and stability of food security. Dietary diversity, adequate quantity and quality of food, the socio-cultural factors all are the concomitants of food security. In this country food allocation within the household may not be based on the nutritional needs of each member. Gender inequality plays a role in this aspect (Pinstrup 2009). Study (Xaxa 2014) Furthermore, households generally face multiple negative shocks over time, and each shock may affect the general welfare, food and nutrition status of the household members. Households adopt particular livelihood strategies to deal with short term insufficient food access. Barring few (Bhagat et al. 2019; Xaxa 2014) none of the studies have focused on household strategies to prevent and manage the food crises.

### ***Objectives***

The main objectives of the study are to:

- Determine the status food security among households in the study area, and examine the factors responsible for food security status.
- Explore the adopted coping strategies of population at the time of food insecurity.

## **Material and methods**

### ***Study areas & Study population***

The present study was conducted in Kolkata district, of the state of West Bengal. Kolkata was purposively selected as one third of the population of Kolkata lives in registered slums and unregistered squatter. Slums and squatter of Kolkata are inhabited by inter-district and inter-state poor migrants. The present study population was selected from squatter settlement of Tala, Bagbazar khal, locally known as Maratha Ditch area. They inhabited at the both bank of this ditch. The migrants primarily belong to lower economic status and were dominantly non literate. These people live in overpopulated and unhygienic conditions. A large number of them were engaged in non-informal sectors like, petty manufacturing, factory work, transport sector and domestic helper. They suffer from various labour market issues like insecurity of jobs, late and non-payment of wages, intermittent availability of work, absence of job contract and social securities (Banerjee 2016). Women aged (17-65 years) who were largely responsible for handling the food preparation and food distribution within the household, were selected as interviewee of the study. A total number of 150 households were selected at the study area.

***Data types and data collection techniques:*** Data were collected on socio economic aspect, and consumption behaviour.

Socio economic aspect

Socioeconomic aspect include data on marital status, years of education, occupation type, monthly income of household in Indian rupees, years of living in squatter settlement, wall and floor type, cooking place and cooking medium of household.

Tools to access food security

Consumption behaviours were measured through Food Coping Strategies (FCS) (SPRING 2008) and The Household Food Insecurity Access Scale (Coates, Swindale, and Bilinsky 2007). FCS counts the frequency (how often coping strategies used) and severity (the degree of food insecurity) of behaviours in which people engage when they do not have enough food or enough money to buy food.

Data on household consumption behaviours like coping strategies of food and household food insecurity access scale were collected by the one trained female research assistant by using a structured questionnaire. Each of the women was interviewed individually in her own household. Community focus groups discussions were conducted by author to determine the severity scoring of the various coping strategies that they adopted.

The Household Food Insecurity Access Scale (HFIAS) was designed to capture household behaviours signifying insufficient quality and quantity and anxiety over insecure access (Coates, Swindale and Bilinsky 2007). It consists of nine frequency-of-occurrence questions related to experience of food insecurity that ever occurred during the previous four weeks (30 days) at the time of data collection. The participants were asked to respond to each of these questions with one of the four options provided to them that signify the frequency of occurrence of each of these incidents: (i) no occurrence=0; (ii) rarely (once or twice in the past four weeks)= 1; (iii) sometimes (three to ten times in the past four weeks)=2; (iv) often (more than ten times in the past four weeks)=3. Thus the total score of nine questions varied from 0-27. After that Household Food Insecurity Access (HFIA) category for each household had been calculated; 1 = Food Secure, 2=Mildly Food Insecure Access, 3=Moderately Food Insecure Access, 4=Severely Food Insecure Access (ref: table-2). Category of food security was determined followed by these rule:

HFIA category = 1 (food secure) if [(Q1a=0 or Q1a=1) and Q2=0 and Q3=0 and Q4=0 and Q5=0 and Q6=0 and Q7=0 and Q8=0 and Q9=0]
HFIA category = 2 (mildly food insecure) if [(Q1a=2 or Q1a=3 or Q2a=1 or Q2a=2 or Q2a=3 or Q3a=1 or Q4a=1) and Q5=0 and Q6=0 and Q7=0 and Q8=0 and Q9=0]
HFIA category = 3 (moderately food insecure) if [(Q3a=2 or Q3a=3 or Q4a=2 or Q4a=3 or Q5a=1 or Q5a=2 or Q6a=1 or Q6a=2) and Q7=0 and Q8=0 and Q9=0]
HFIA category = 4 (severely food insecure) if [Q5a=3 or Q6a=3 or Q7a=1 or Q7a=2 or Q7a=3 or Q8a=1 or Q8a=2 or Q8a=3 or Q9a=1 or Q9a=2 or Q9a=3]

Household food insecurity access score

Prevalence of different levels of household food insecurity (access) of this particular area was calculated in this way: HFIA Prevalence = (Number of households with specific HFIA category/ Total number of households with a HFIA category) × 100 [ref: table-3].

Specific coping behaviours depend on local circumstances and practices. In this study coping behaviours was estimated through quantitative and qualitative way. Firstly how often these specific behaviours used in the recent past (recall period was last seven days) and secondly how “severe” was each of these individual coping strategies considered to be? This information was collected from community-level focus groups and it provides the insight for perceived severity of each coping strategies. The women who form study populations and already interviewed for this study were divided into ten focus groups of twelve members each. The focus groups discussed their coping strategies at the time of food insecurity and they asked to identify the least and most severe individual strategies that they adopted. Then they instructed, to identify any other strategies that seem to them equivalent to these two extreme individual strategies.

After identification of these two extreme strategies the rest of the consumption behaviours were taken as intermediate categories. This level of severity is based on frequency of use of the individual strategy. There were eleven different coping strategies. After that average score had been calculated from each of the eleven coping strategies. Consensus ranking was considered from average score. Perceived severity had been grouped into four categories, where 1=least severe category; 4 = most severe, and 2 and 3 were intermediate. Highest and lowest consensus ranking values were considered as most and least severe coping strategies and rest were intermediate (ref: table-5).

***Ethical consideration:*** Participants were informed about nature, aim of the study and their voluntary participation before data collection.

***Data analyses:*** Data was analysed with the help of SPSS 20. Descriptive statistic was used for socio demographic profile, household food insecurity status and food coping strategies. Linear regression was calculated to explore the factors for food insecurity. For calculating factors for household food insecurity those households identified as food insecure was consider as dependent variable. Number of family members, years of education of female and male adult populations, income of households and years of living in squatter settlement were taken as independent variables.

## **Results**

Table 1 stated socio demographic features of the population and their households. An overwhelming section of population was married. The mean years of education of female and male were  $3.2 \pm 0.2$  years and  $3.7 \pm 0.2$  years respectively. Majority of female and male were engaged in informal sector, worked as household helper and daily labour respectively. Majority



of households wall were built by bamboo and mud, floors were cemented. Larger section had no separate place for cooking; they did it in their bedroom. An overwhelming section used wood as cooking medium. Larger section of households' members lived more than twelve years in this squatter settlements.

All the responds were taken with the help of last four weeks recall period. More than half of individuals were worried that their household would not have enough food. Overwhelming sections were not able to eat preferred food and had to take limited variety of food due to lack of their resources. Two fifth populations had to eat some foods that they really do not want to eat. Around thirty percent of them had to eat a smaller meal, went to sleep at night hungry and spend a whole day and night without eating anything as households had not enough food. One fifth had no food to eat in household or eat fewer meals in a day because of non-availability of enough food in households (Table 2).

Majority of households had experienced severe food insecurity followed by moderate and mild food insecurity. One fifth sections of them were food secure. With respect of food insecurity prevalence of study area found that percentage of severely food insecure (access) households were 40.68, moderately and mildly food insecure households were 30.51 and 28.81 respectively (Table:3).

Decrease of monthly household income significantly increase the likelihood of household food insecurity (Table:4).

None of our study participants consumed wild foods, eat seed stock, had sent their own household members to beg and skip entire day without eating. Borrow food and feed working members of household at the expense of non-working members were least severe strategies had

adopted by household members. Purchase food on credit, sent household members to elsewhere for food intake, consume limited portion of food and restrict food consumption by adults in order for small children were intermediate strategies. Consume less preferred, less expensive food and reduce number of meals eaten in a day were severe strategies of these households (Table:5).

## **Discussion**

India has impressive economic progress with the achievements in the domain of agriculture (Upadhyay and Palanivel 2011). The National Food Security Mission has played a key role in increasing production of cereals and pulses in eastern India where green revolution did not take place (Narayanan 2015). However, today the crux of India's food problem is poverty and inequality in productive resources. Ensuring food access in a sustainable way would appear to become more concerns over food availability. Semi-urban and urban living poor people face the problem of food insecurity mainly because most of them do not have any productive resource. Present study conducted on the household level food security at the squatter settlement of Kolkata. All of the inhabitants were migrated from rural areas of North 24<sup>th</sup> pargana or Nadia district. The major reasons of these migrations were lack of job opportunity and food insecurity. Population in the present study were engaged in informal sector, those have no job security. They live in unregistered area and did not get the facilities of Public Food Distribution System (PDS). They had to purchase their food from local areas. Baring one fifth sections of household, rest of them were food insecure. Among various level of food insecurity, severe food insecurity was more prevalent in those households (40.68%). However, food insecurity reported in the current study was lower than in previous study done in other parts of the country (Chinnakali et al. 2014). Present study revealed that monthly low household income was one of the significant factors of food insecurity. Thus sustainable employment initiative in that area can be way to get

rid from household food insecurity. Along with that, others problems that play a role for food insecurity in slum and squatter settlement of urban areas are absence of agricultural productivity, owing to inadequate resources, extremely low literacy rate and lack of job opportunities (Bhagat et al. 2019; Das and Saha 2016). Present research corroborate with it.

This research has some limitation. As this is a small scale study generalization is not possible. This is time constraint study, thus I have not explore their coping strategies over different seasons and times.

### **Conflict of Interests**

The author declares that there is no conflict of interests regarding the publication of this paper.

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## Results

Table 1: Socio demographic variable

	Mean/ (percentage)
Marital status of population (n=355)	
Married	320 (90.1)
Separated	4 (1.1)
Widow/widower	31 (8.7)
Mean years of education of adult female (mean±sd)	3.2±0.2
Mean years of education of adult male (mean±sd)	3.7±0.2
Occupation of female (n=309)	
Small scale business	8(2.6)
Homemaker	10(3.2)
household helper	250(80.9)
Student	41(13.3)
Occupation of male (n=346)	
Labour	251(72.5)
Van puller	26 (7.5)
Business	9 (2.6)
Dependant	5 (1.4)
Student	55 (15.9)
Mean monthly household income (in Indian rupees)	2835.44±0.7
Wall type of household (n-150)	
Bamboo and mud built	109 (72.7)
Cemented	41 (27.3)

Floor type of household	
Asbestos	35 (23.3)
Cemented	95 (63.3)
Mud made	20 (13.3)
Cooking place	
Have no separate place	105(70.0)
Have separate place	45(30.0)
Cooking medium	
Kerosin	3(2.0)
Wood	137(91.3)
Hearth	10(6.7)
Years of living in squatter settlement (n=150)	
Twelve years	15(10.0)
More than twelve years	100(90.0)

Table 2: Status of household food insecurity, based on HFIS

		Rarely	Sometimes	Often	No
1	In the past four weeks, did you worry that your household would not have enough food?	33(22.0)	29(19.3)	26(17.3)	62(41.3)
2	In the past four weeks, were you or any household members not able to eat the kinds of foods you/they preferred because of a lack of resources?	26(17.3)	44(29.3)	36(24.0)	44(29.3)
3	In the past four weeks, did you or any household members have to eat a limited variety of foods due to a lack of resources?	26(17.3)	41(27.3)	27(18.0)	56(37.3)
4	In the past four weeks, did you or any household members have to eat some foods that you/they really did not want to eat because of a lack of resources to obtain other types of food?	22(14.7)	20(13.3)	21(14.0)	87(58.0)
5	In the past four weeks, did you or any household members have to eat a smaller meal than you/they felt you/they needed because there was not enough food?	19(12.7)	11(7.3)	13(8.7)	107(71.3)
6	In the past four weeks, did you or any household members have to eat fewer meals in a day because there was not enough food?	13(8.7)	6(4.0)	11(7.3)	120(80.0)
7	In the past four weeks, was there ever no food of any kind to eat in your household because of lack of resources to get food?	9(6.0)	6(4.0)	2(1.3)	133(88.7)
8	In the past four weeks, did you or any household members go to sleep at night hungry because there was not enough food?	17(11.3)	7(4.7)	8(5.3)	118(78.7)



9	In the past four weeks, did you or any household members go a whole day and night without eating anything because there was not enough food?	19(12.7)	16(10.7)	5(3.3)	110(73.3)

Table 3: Categories of food security

Food security status	Freq(%)
Household with food security	32(21.3)
Household with mildly food insecure	34(22.7)
Household with moderately food insure	36(24.0)
Household with severely food insure	48(32.0)
Total number of households (n=150)	150(100.0)
HFIA Prevalence of study area	
Mildly food insecure (access) households	28.81
Moderately food insecure (access) households	30.51
Severely food insecure (access) households	40.68
Total number of households with a HFIA category (n=118)	100.00

Tables 4: Factors for household food insecurity

Dependent variables	Independent variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
Household food insecurity access score	(Constant)	11.568	1.967		5.880	0.0001
	Number of family members	0.332	0.364	0.112	0.913	0.364
	Education of female	-0.261	0.176	-0.188	-1.484	0.142
	Education of male	-0.035	0.150	-0.029	-0.234	0.815
	Monthly household income (in Indian rupees)	0.0001	0.0001	-0.337	-2.783	0.007
	Years of living in squatter	-0.013	0.032	-0.045	-0.410	0.683

Table 5: Food Coping Strategies adopted of study populations

	FG 1	FG2	FG3	FG4	FG5	FG6	FG7	FG8	FG9	FG10	Ave.	Consensus Ranking	Severity
Less preferred food intake	4	3	5	2	3	2	4	5	4	5	3.7	4	Most severe
Less expensive food intake	5	4	5	4	6	5	5	3	4	2	4.3	4	Most severe
Borrow food	2	1	0	2	1	1	1	0	1	1	1.0	1	Least severe
Buy food on credit	7	5	2	2	3	1	4	2	2	2	3.0	3	Intermediate
Household members eat elsewhere	1	2	2	1	0	3	1	2	3	2	1.7	2	Intermediate
Beg	0	0	0	0	0	0	0	0	0	0	0.0	0	Not applicable
Eat limited portion of food	1	3	1	1	3	0	0	3	4	4	2.0	2	Intermediate
Restrict adult intake	2	3	2	4	3	3	2	4	3	7	3.3	3	Intermediate
Feed workers	1	2	1	1	2	0	0	0	2	3	1.2	1	Least severe
Reduce number of meals	4	3	3	4	3	3	4	5	4	5	3.8	4	Most severe
Skips entire days without eating	0	0	1	0	1	0	0	0	0	0	0.2	0	Not applicable