FACTORS GOVERNING FOOD SECURITY AMONG RURAL HOUSEHOLDS IN TRIBAL DISTRICT OF SOUTH GUJARAT

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ABSTRACT

Availability of food is associated with purchasing power and food insecurity is caused by poverty. The needs of the poor should be protected by improving their purchasing power, through proper planning of agricultural activities for future that can produce more employment and income generation programmes. Around 20.4 per cent of Gujarat's current population does not get enough calories from food as compared to the all-India figure of 13.4 per cent. The problem of food insecurity is basically not found in all sections of the people, rather it is mostly confined to certain marginalized sections. It includes scheduled tribes (STs) as they are socially and economically disadvantaged due to their isolation both geographically as well as culturally from the mainstream population. The attempt has been made to study the major factors governing food security in the Dangs - a tribal district of south Gujarat having 95 per cent scheduled tribe population. Results showed that household size, dependency ratio and age of the household head has significant negative association with food security whereas animal herd size and above poverty level status of household have positive influence on food security. The government should focus on awareness creation on effective family planning and the impact of large family size on ensuring food security, Government can initiate or strengthen old programmes for alternative income generation through facilitation of labour-intensive schemes.

Keywords: *food security, poverty, scheduled tribes, rural households*

INTRODUCTION

According to FAO *et al.,* (2001), food security is a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The concept of food security basically stands on three pillars, food availability, food stability and food accessibility. Availability of food is associated with purchasing power and food insecurity is caused by poverty (Sunil and Vinaya, 2016). If people do not have purchasing power, they have substitute of food reserves. Food security and poverty are directly related to each other. So the needs of the poor should be protected by improving their purchasing power, through employment and income generation programmes. A large proportion of the world's underfed population starves not because of general food shortage but because of insufficient access to food supplies or insufficient consuming power of people (Vinaya *et al.,* 2020). Availability of food will be of no use, until and unless people have means to buy the available food (Ghosh, 2000 and Shinde *et al.,* 2021).

India is the home of 1.21 billion people as per 2011 census out of which, as estimated by Food and Agricultural Organization, 195 million people or 15 per cent of the total population, are undernourished which account for one-fourth of the world's hungry population (FAO/IFAD/WFP, 2015). All the UN Millennium Development Goals (MDGs) are centered to health parameter which influences all other MDGs (John *et al.,* 2021). India ranked 94 among 107 countries in the Global Hunger Index 2020 and is in the 'serious' hunger category with a score of 27.2. India features behind Nepal (73), Pakistan (88), Bangladesh (75), and Indonesia (70) among others despite of various initiatives by Government of India like Integrated Child Development Services (ICDS) Scheme, National Food Security Act, POSHAN Abhiyaan etc.

Despite the economic significance of the agriculture sector, there are undoubtedly misguided perceptions regarding the status of food security in India. The agricultural industry, crucial to maintaining India's large population, employs approximately 743 million Indian (O'Brien, 2004; Kapila *et al.*, 2009). Although agriculture constitutes only 20 per cent of India's national Gross Domestic product, it makes up 85 per cent of the economy in rural India (Kapila *et al.*, 2009).

Around 20.4 per cent of Gujarat's current population does not get enough calories from food as compared to the all-India figure of 13.4 per cent. Seven per cent of Gujarat's

children suffer from severe malnutrition while another 44 per cent suffer from moderate malnutrition. It is estimated that over 60 per cent of children in Gujarat under the age of five are either moderately or severely malnourished (Hirway and Mahadevia, 2003). In Gujarat, NFSA implementation began on April 1, 2016, and 3.41 crore people have been identified for subsidized ration (per person 5 kg) along with 8 lakh most poor (Antyodaya) families (42 lakh people), to whom 35 kg of ration is given per month per family. Thus 3.82 crore people are being covered under NFSA with the support of the Government of India.

The food consumption pattern of household is subject to various socio-economic characteristics including asset position and financial background. Thus, the problem of food insecurity is basically not found in all sections of the people, rather it is mostly confined to certain marginalized sections (John, 2021). It includes scheduled tribes (STs) as they are socially and economically disadvantaged due to their isolation both geographically as well as culturally from the mainstream population. In this context, the present study attempts to analyse factors governing food and nutritional security of rural households in Dang which is tribal district of Gujarat.

OBJECTIVE

To study various factors influencing food security status of the rural households

METHODOLOGY

Data and sampling framework

The Study was carried out in Dang district which is having highest scheduled tribe (ST) population in Gujarat. The study primarily relied on primary data which was collected by using a semi -structured questionnaire focusing mainly on those factors hypothesized to have an effect on the food insecurity status of households. The Dang has a population of 2,28,291 with 44,699 households in the district. Dang is composed with three administrative blocks. Multistage random sampling with proportional to size was used to select 150 sample households. In first stage two tehsils Waghai and Ahwa were selected randomly. In second stage, out of each tehsil, randomly three village panchayats selected. Finally, a sample of 150 households was drawn randomly from villages come under selected six village panchayats. Sample households were selected on the basis of their frequency distribution in each land size category i.e., landless, marginal, small, medium, large.

Analytical tools

Initially incidence of food insecurity was estimated

with the help of Foster, Greer and Thorbecke, (1984). Based on the household food security index (Z), the linear model was estimated to identify the factors that affect the food security status of the respondents of Dang district of south Gujarat. This study utilized a regression model to empirically quantify the relative influence of various factor on the respondents.

Model:

$$P = F(Z) = \frac{1}{1 + e^{-Z}}$$

Where,

P = probability that household is food secure or insecure

F = logistic function

$Z = \beta_1 + \beta_2 X$, $Z = 1$ means food secure $Z = 0$ means otherwise

β_1 and β_2 are coefficients of explanatory variables

X is matrix of various household characteristics.

The implicit form of the model was as follows:

$$Z_i = \beta X_i + U_i$$

Where,

Z_i = The food security status of ith household;

X_i = Vector of explanatory variables;

U_i = Error term; and

B = Vector of parameter estimates.

Thus, the model has been fitted with following formula:

$$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + B_7 X_7 + B_8 X_8 + B_9 X_9 + B_{10} X_{10} + B_{11} X_{11}$$

Where,

X1 = Education level of household heads (1- illiterate, 0- literate)

X2 = Primary activity of household head (1- cultivar, otherwise 0)

X3 = Primary activity of household head (1- agricultural labour, otherwise-0)

X4 = Household size (no.)

X5 = Dependency ratio

X6 = Age of household heads (years)

X7 = Total land (Acre)

X8 = Livestock owned (1-If having livestock, otherwise-0)

X9 = Asset possession (Rs.)

X10 = Poverty (If APL-1, Otherwise-0)

X11 = Access to credit (Yes-1, No-0)

RESULTS AND DISCUSSION

Socio-economic backgrounds of the selected households

The data presented in Table 1 depicts the socio-economic background of sample households. The average size of land holding in the study area was 2.74 Acre. Average herd size in the study area was 2.18 animals. Average age of household head found 51 years and family size of around five members.

Table 1: Selected Socio-economic Characteristics of Households (n=150)

Sr. No.	Characteristics		Number
1	Sample households (no.)		150
2	Average land holding (acre)		2.74
3	Average herd size (no.)		2.18
4	Average age of household head (years)		51
5	Average household size (no.)		4.88
6	Gender of households (%)	Male	95.33
		Female	4.67
7	Social group of household (%) scheduled tribes		100
8	Occupation of household head (%)	Self-employed in agriculture	53.33
		Agricultural labour	24
		Employee in services other than agriculture	17.33
9	Landless (%)		28
10	Small and marginal farmers (%)		36
11	Large farmers (%)		36
12	Education of hh head (%)	Literate	44.67
		Illiterate	55.33
13	Above poverty line (%)		22.67
14	Belove poverty line (%)		77.33
15	Access to credit (%)		
16	Yes (%)		17.33
17	No (%)		82.67

As to households' literacy status, the study indicated that 44.67 per cent of the respondents (household head) had access to formal education and capable to make proper decisions. Around 55 per cent household head were illiterate which adversely affect the decision-making capacity for various risks. Furthermore, the study finding showed that 82.67 per cent of the sampled households had no access to credit service in the study area, implying that the majority of the households did not receive any type of credit from formal and informal sources. As 17 per cent household had access to credit which made them capable to mitigate various economic risks. From the total samples, 22.67 per cent households were found Above poverty line which ensure a basic living standard with enough money for things such as food, clothing and place to live and majority of the households that is 77.33 per cent were found Below poverty line affecting income and consumption levels, education, medical requirements and credit access.

Factors influencing food security of households

The results of the maximum likelihood estimate of the logit model are presents in table 2. The model result has indicated that out of eleven variables fitted into the model, six were found statistically significant predictors of households' food security. These include primary occupation of household that is agricultural labour, household size, dependency ratio, age of household head, herd size, poverty line. Other variables included in the model were not found significant

The model result has revealed that there is a positive relationship between food security and those who engaged in labour activity in agriculture. This variable is significant at 10 % significance level.

The result found that there is a negative relationship between the size of household and their probability of being food secure. In other words, it is to mean that as family size increases, the probability of being food secure also decreases marginally, holding other things remaining the same. The

association between household size and household to be food secure is negative and highly significant at less than 1 % level of significance in the study area. As the model result prevalence of large number of non-productive age members in household.

presented in Table 2 below shown, for unit increase in the family size of a household increases the likelihood of being food insecure by 1 per cent. This might be attributed to the prevalence of large number of non-productive age members in a household thereby increasing the dependency ratio of the household.

Table 2: Factors influencing food security of households (n=150)

Factors influencing food security of HH	Coef.	Marginal Effects (ME)	Std. Err.	Z
HH head education (literate-0, illeterate-1)	-0.06	-0.00048	0.86	-0.07
Occupation D1Cultivar (If cultivar-1, otherwise-0	3.27	0.03	2.10	1.55
Occupation D2Agrilabour (If agrilabour-1, Otherwise-0)	4.07*	0.03	2.22	1.83
HH size (Nos.)	-2.05***	-0.017	0.58	-3.50
Dependency ratio	-1.40***	-0.011	0.50	-2.80
Age of HH head (Yrs.)	-0.08**	-0.0007	0.04	-2.02
Operational Holding (Acre)	-0.12	0.0009	0.27	0.42
Herd size (Nos.)	0.47**	0.003	0.22	2.09
Asset possession (₹)	0.0002	2.04e-06	0.001	0.13
Poverty (If APL-1, Otherwise-0)	2.63*	0.056	1.64	1.60
Access to credit (Yes-1, No-0)	0.45	0.0044	1.06	0.43
Constant	11.64	-	3.68	3.16
No. of obs.	150			
LR chi2	90.45			
Pseudo R2	0.60			

(***, **, * Significant parameters at 1%, 5%, and 10%, respectively)

As expected, dependency ratio negatively and significantly affected household food security at 1% significance level. From the model output, the marginal effect revealed that one extra person in the household increased the probability of household's intensity of food energy intake deficiency by 1%. This indicates that households with higher dependency ratio tend to be more food energy deficient. This is due to the reason that, households with large family size could be composed of large number of non-productive members; which imposes high burden on the labour force and food available to each person and ultimately end up with difficulty to achieve food security. Due to the scarcity of resources, an increase in household size especially the non-working members put pressure on consumption than production. An increase in the number of non-working member of household or dependency ratio increases the food insecurity level of household.

It can be seen that household extent of food security is negatively associated with age of household head and significantly at 5% significance level in the study area. The

marginal effect, from of the model result, indicated that a one unit increase in the age of head of the household decrease the likelihood of household's extent of food security almost negligibly. This implies that old aged household heads within food insecure households were more likely to face higher degree of energy intake deficiency than younger ones. This is because as age increases households become less productive and have less courage to cultivate larger-size farm than young ones. In addition, mostly elder households have large number of families and their resources are distributed among the members, and this imposes pressure on their income to purchase consumable products.

As predicted, the result confirmed that herd size is positively and significantly associated with food security at 5 % significance level. Livestock contribute to household's economy in different ways: as a source of pulling power, source of cash income, source of supplementary food and means of transport. Thus, households with a greater number of livestock have a better chance to be food secure because of availability of milk products and supplemental income.

On the basis of result obtained households above poverty line positively and significantly affected household food security at 10 % significance level. The households above poverty line which ensure a basic living standard with enough money for things such as food. Household above

poverty line had better access to food than household below poverty line.

The other variables like education of household head have negative relation with household being food secure. Illiterate household head were less likely to be food secure. Households whose primary activity is cultivation has positive impact on food security. Those who possess land were found more likely to be food secure. These variables were not found significant.

Table 2 also presents the marginal effects (ME) of the variables which tell us that how changes in specific variables affect the probabilities of households to be food secure positively or negatively. The marginal effects are used here as they denote the marginal changes of the dependent variables as a result of changes in the respective explanatory variables. It was found that those household were engaged in labour activity in agriculture increased the probability of household being food secure by 3% points. Next most influential variable found was household size as a unit increase in it reduces the probability of household being food secure by 1.7% points. Similarly, unit increase in dependency ratio reduce probability of household being food secure by 1.1% points. The marginal effect, from of the model result, indicated that a one unit increase in the age of head of the household decrease the likelihood of household's extent of food security almost negligibly. Likewise for herd size marginal effects result were negligible. It was found that a unit increase in APL card holders increases chances of household being food secure by 5.6% points.

CONCLUSION

The government should focus on awareness creation on effective family planning and the impact of large family size on ensuring food security, and awareness creation and capacity building for elder households through ensuring the availability and dissemination of accurate information should be strengthened. Government can initiate or strengthen old programmes for alternative income generation through facilitation of labour-intensive schemes.

CONFLICT OF INTEREST

The authors of the paper declare no conflict of interest

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