CRITICAL ELEMENTS FOR THE SUCCESS OF FOOD SECURITY SYSTEM

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Abstract:

Food Security and Nutritional Security are the most important challenges confronting the developing economy like India. Government enacted Food Security Act to provide essential commodities like Rice, Wheat, Pulses, Oil and Sugar to the needy sections of the society. The food security empowers the people to tide over poverty, hunger, mal nutrition and physical problems. This paper attempts to demystify the critical elements involved in the success of Food Security System in India. The critical elements identified for the success of food security system in India are convenient location of ration shops, adequate stocking of food grain, timely supply of commodities, and quality of ration goods and behaviour of staff at food security system. The success of the food security system depends on government policies and administrative staff. The affordability and accessibility of food is an important factor contributing to the effective functioning of Food Security System.

Keywords: Food availability - Sustainable food security- Food security system-Critical elements

Introduction

Food security refers to the availability of food and one's access to it. A household is considered food-secure when its occupants do not live in hunger or fear of starvation. According to the World Resources Institute, global per capita food production has been increasing substantially for the past several decades. Food production is the base for food security. The internationally accepted definition of food security is that given by the Food and Agriculture Organization of the UN (FAO) "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".

Food availability, food utilization, and food access are the principle variables that define household food security and should guide interventions. Food is properly used and many suitable techniques are employed for storage. At the global level, Hunger results from political and economic inequality, environmental degradation, unjust trade policies, inappropriate technology, and other factors depending on local context. At the local level, the food inequality results by the lack of nutritional education, poor quality of food, and from inadequate quantities of the rights kinds of food. Weaknesses in the variables of access, availability, and proper utilization of food lead to what individuals and households experience as hunger. There are considered to be two types of food insecurity: chronic and temporal. Chronic food insecurity results from inadequate food intake over a longer period of time and is constant. Temporal food insecurity results from a temporary decrease in food intake due to price changes, production failures, or a loss of income. Food production provides the base for food security as it is a key determinant of food availability. This paper deals with different aspects of ensuring high productivity and production for ensuring adequate food availability

Statement of the problem

Food Security and Nutritional Security are the most important challenges confronting the developing economy like India. Malnutrition is the lack of one or more essential nutrients in food. About

15-20 million deaths are occurred annually due to malnutrition. Human nutrition is the provision to humans to obtain the materials necessary to support life. Lack of food remains a serious problem, with about 36 million humans starving to death every year. Malnutrition can also be a consequence of other health issues such as diarrheal disease or chronic illness etc. Major causes of malnutrition include poverty and food prices, dietary practices and agricultural productivity. As much as food shortages may be a contributing factor to malnutrition in many countries .Childhood malnutrition is also common and contributes to the global burden of disease. However global food distribution is not even, and obesity among some human populations has increased to almost epidemic proportions, leading to health complications and increased mortality in some developed, and a few developing countries. Malnourishment is the lack of specific components of food such as proteins, vitamins or essential components. Undernourishment is the lack of sufficient calories in available food, so that one has little or no ability to move or work.

Scope of the study

India has had a growing problem with food output and availability for the mass of the population since the inception of neoliberal economic reforms in 1991. A deep agricultural depression and rising unemployment rates resulting from "reform" policies have made the problem especially acute over the past decade. There has been a sharp decline in per capita grain output as well as grain consumption in the economy as a whole. Income has been shifting away from the majority towards the wealthy minority and a substantial segment of the population is being forced to eat less food and wear older clothing than before. This is exacerbated by the current global depression, which is further constraining mass consumption because of rising unemployment. In a complex and changing scenario it is useful to distinguish the long-term and immediate factors giving rise to the food problem. At increasing per capita income levels, an increasing amount of grain is consumed, so the total per capita grain consumption rises fairly sharply with rising income. The share of direct cereal demand in the household food budget does decline, but there is an absolute increase of total cereal demand and no decline in its overall share in the food budget. In this context this study will be addressed the essential of food security in India.

Objectives

1) To analyse the elements are involved in the food security

2) To know the relationship for the elements in the food security

3) To know the adequacy of quantity and acceptability of the quality of the elements

Review of literature

Swaminathan (1986) explains the need for shifting to the concept of 'Nutrition Security', which he has defined as "physical, economic and social access to balanced diet, clean drinking water, environmental hygiene, primary health care and nutritional literacy".

Adam Smith remarked in his *Wealth of Nations* that there was a natural upper bound to the demand for food, since how much a person could eat was limited by the size of his stomach. He could not have foreseen the sharply increasing animal-products intensity of diets as populations grew better off. The per capita direct plus indirect grain demand of the United States, at 900 kg per year, is seven times the comparable per capita grain demand of the poorest nations, although North American

stomachs are obviously not seven times larger. The required direct grain consumption for minimum daily energy intake for working and health is often not available to the poorest nations and any slight output or import shortfall can tip large segments of the population into famine. This not always because these nations produce too little grain to feed their populations, but because the end use of the grain they do produce is determined by the superior purchasing power of their own elites and of richer Northern populations.

Economic Survey (Chapter eight) 2012-2013 titled "Agriculture and Food Management" gives a comparative picture of the area, production and yield of crops during 1980-1981 to 1989-1990, 1990-1991 to 1999-2000 and 2000-2001 to 2011-2012. With regard to rice and wheat, while the compound annual rate of growth (CAGR) in area was marginal at 0.41 and 0.46 per cent, respectively during the 1980s, growth in both production and yield was above 3 per cent. The CAGR of area improved to 0.68 per cent for rice and 1.72 per cent for wheat between 1990-1991 to 1999-2000, but it fell for both production and yield in the case of rice and yield in the case of wheat. The subsequent decade 2000-2001 to 2011-2012 saw an improvement of area under wheat but the CAGR of production fell for both rice and wheat. This suggests that in these two crops there is need for renewed research to boost production and productivity. Further, it is necessary to note that these two crops together constituted 78 per cent of total food grains production in 2009-2010.

Results and Discussion

Government enacted Food Security Act to provide essential commodities like Rice, Wheat, Pulses, Oil and Sugar to the needy sections of the society. The food security empowers the people to tide over poverty, hunger, mal nutrition and physical problems. This paper attempts to demystify the critical elements involved in the success of Food Security System in India.

1. Analysis for the elements are involved in the food security

The critical elements involved in the success of food security are

i) Convenient working
ii) Timely supply
iii) Time spent
iv) Convenient working hours
v) Quota availability
vi) Adequacy of quality
vii) Acceptability of quality
viii) Behaviour of staff.

CRITICAL ELEMENTS: CORRELATION

An inter correlation study was conducted to find out the significant relationship among the critical elements. The correlation matrix is shown in Table 1.

Table 1

Elements		1	2	3	4	5	6	7	8	9	Total
			**	*	*			**		**	**
1.	Convenient location	1.000	0.2506	-0.1107	-0.0607	0.0605	0.0057	0.1624	0.0808	0.2001	0.2434
				**		**	**	*	**	**	**
2.	Timely supply		1.000	-0.1234	-0.0018	0.4322	0.1514	0.1068	0.1470	0.6148	0.5831
						*				**	**
3.	Times spent			1.000	0.0218	-0.0983	-0.0112	-0.0707	-0.0510	-0.1330	0.1545
						*	*			*	**
4.	Convenient working hours				1.000	0.1087	0.1055	-0.0707	-0.0510	-0.1330	0.1545
							**			**	**
5.	Quota availability					1.000	0.1514	0.0338	0.2953	0.3575	0.4681
										**	**
6.	Adequacy of quantity						1.000	0.0546	0.1294	0.1477	0.7104
										*	**
7.	Acceptability of quality							1.0000	0.0894	0.0979	0.3029
										**	**
8.	Behaviour of staff								1.0000	0.2624	0.3902
											**
9.	Overall assessment									1.0000	0.6299
	Total										1.0000

Critical Elements: Correlation

**** = P < 0.01 * = P<0.05**

The above study established that the following elements have a positive relationship.

- Convenience of location and timely availability
- Convenience of location and quality of supply
- Convenience of location and overall assessment
- Convenience of location and quota availability
- Timely supply and adequacy of quotas
- Timely supply and quality of supply
- Timely supply and behaviour of staff
- Timely supply and overall assessment
- Convenient working hours and quota availability
- Convenient working hours and adequacy of quotas
- Convenient working hours and overall assessment
- Quota availability and adequacy of quotas
- Quota availability and overall assessment
- Adequacy of quotas and overall assessment
- Acceptability of quality and overall assessment
- Behaviour of staff and overall assessment.

The following elements are found significantly related in a negative way:

- Convenient location and time taken to purchase
- Convenient location and convenient working hours
- Timely supply and time taken to purchase
- Time spent to purchase and quota availability
- Time spent to purchase and overall assessment

The nine chosen elements chosen have a good degree of relationships either in a positive or negative way. This finding further justifies the choice of elements.

2) Analysis for the relationship of the elements in the food security

Adequacy of Quantity - Correlation

An inter correlation matrix was constructed to find out the significance of correlation among the responses relating to adequacy of entitlements (quotas) of Rice, Wheat, Sugar and Kerosene. The matrix is as found in Table 2.

Table 2

Adequacy of Entitlements - Correlation Matrix

	Rice	Wheat	Sugar	Kerosene	Total
		**	**	**	**
Rice	1.0000	0.1596	0.2679	0.3192	0.5243
			**	**	**
Wheat		1.0000	0.5269	0.4433	0.7633
				**	**
Sugar			1.000	0.5370	0.8133
					**
Kerosene				1.0000	08.038
Total					**1.0000**

** = P < 0.01

There is significant correlation among all the above items. This confirms the responses already depicted in Table 2.

Acceptability of Quality - Correlation

Another inter correlation matrix was constructed to find out the significant correlation among the responses relating to the acceptability of the qualities of Rice and Wheat supplied under the Food Security System (Table 3).

Table 3, Acceptability of Quality - Correlation Matrix

	Rice	Wheat	Total
		**	**
Rice	1.0000	0.1596	0.5243
			**
Wheat		1.0000	0.7633
Total			**1.0000**

** = P < 0.01

There is significant correlation between these items.

Discriminate function analysis

The data generated in this study have been analysed on the univariate basis. This analysis provided some insight into the implications of the data. However, it has a limitation of having larger error variants and smaller experimental variants. In multivariate analysis experimental variants can be maximised. Among the available multivariate methods, stepwise discriminate function analysis was selected for further analysis of the data (Klecka 1980). This will enable one to find out more important and finer differences among the rural and urban groups regarding their responses to the nine selected elements. The procedure involves transforming the original variables into new variables (discriminate functions) which describe group differences on the basis of a few fundamental dimensions. In this study the discriminant function analysis was attempted to identify, among the 9 elements, those which had the power of discrimination between the rural and urban consumers. Wilks Lambda and Rao's V have used as stepwise method for selecting the best set of discriminate variables. The following criteria were fixed for the analysis.

- Minimum tolerance level : 0.00100
- Minimum F to enter : 1.0000
- Maximum F to remove : 1.0000
- Maximum signifiance of WilksLamboda : 1.0000

After doing the stepwise variable selection, it was found that at the third step itself, only 2 variables remained for final analysis and the other 7 were eliminated.

Table 4
Stepwise Discriminate Analysis

Steps	Variable	Wilks lambda	Sig	Rao's V	Sig	Change	Sig
1.	Overall assessment	0.99379	0.1232	2.38620	0.1224	2.38620	0.1224
2.	Convenience of location	0.98937	0.1307	4.10464	0.1284	1.71845	0.1899

It can be seen from the above that even the two remaining elements have not produced any significant change in the Rao's V. Thus, it is seen that in general none of the 9 elements have any significant contribution to make to the rural or the urban group as the case may be.The size of Eigen value is related to the discriminating power of the function. The larger the Eigen value the greater the discrimination. In the study the calculated Eigen value for the remaining variable "overall assessment" is 0.0107 and the canonical correlation coefficient is 0.1031. The canonical correlation value shows that the discrimination function and the selected elements will not discriminate the 2 groups (rural and urban) quite effectively.A similar analysis was attempted after classifying the consumers according to their income as low, middle and high income groups. Here also only 2 elements viz. behaviour of staff and acceptability of quality stood out after eliminating the remaining 7 elements (Table 5)

Table 5
Summary of Tables of Discriminate Analysis by Income Group

Steps	Variable	Wilks lambda	Significance	Rao's V	Significance	Change	Significance	Eigen Value	Cannon
1.	Behaviour of staff	0.97216	0.0046	10.90899	0.0043	10.90899	0.0043	0.0331	0.1789
2.	Acceptability of quality	-0.96297	0.0062	14.58339	0.0056	3.67441	0.4563	0.0052	0.0720

Of the 2 elements, acceptability of quality is not contributing in any significant measure as shown by the change in Rao's V. Thus only one element viz. behaviour of staff stands out where there is a significant discrimination among the various income groups.

Conclusion

The critical elements identified for the success of Food Security System in India are convenient location of ration shops, adequate stocking of food grain, timely supply of commodities, and quality of ration goods and behaviour of staff at Food Security System. The success of the Food Security System depends on government policies and administrative staff. The affordability and accessibility of food is an important factor contributing to the effective functioning of Food Security System.

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