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Socioeconomic Determinants of Food Security: Evidence from Jhang District of Punjab, Pakistan

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Abstract

Pakistan is a victim of food insecurity and poverty despite of being an agricultural country in the world for last four decades. Severe floods and droughts in different times and increasing gap between supply and demand of basic food items are accelerating to food insecurity issue around the country. Appreciable policies enforced to manage supply of basic food stuff and to control their prices, but still it is in the trouble of food insecurity. Therefore, this study will focus on key socioeconomic factors of food insecurity in district Jhang which is among 80 suffering districts of Pakistan, using logistic regression model. The data set contained 200 respondents.

Empirical outcomes depict that age of household head, negative shocks and respondents with no and up to twelve years of education have a significant and negative impact on food security with the odds of 0.725, 0.69, 0.853 and 0.74 respectively. On the other hand, number of family members between 2-6 and 7-10, rented area, owned area and more earning hands are also significantly causing more chances of food security with the odds of 15.74, 5.22, 0.082, 5.864, and 3.878 times respectively. Loans schemes at favorable interest rate, reasonable inputs prices, and timely information about supply shocks are key suggestions to meet food insecurity.

Keywords: food security; socioeconomic; Pakistan

Introduction

Each and every developed or non-developed country in the world is facing food insecurity situation. A large number of populations of 848 million in 2003-2005 globally increased to 923 million in 2007 due to radical price increase in main food items and oil crops in 2008 (FAO, 2008).

In the developing nations, most urban people are suffering from food insecurity which may be doubled from 17 billion in 1995 to 34 billion 2020. The increasing urban population is not meeting the adequate food. This non–fulfillment of food goes to raised food insecurity and presence of poverty in urban people (Maxwell et al., 2000).

Pakistan is the 6th populous country in the world with a population of about 161 million and second amongst the Muslim countries (Economic Survey of Pakistan, 2008). Current figures not officially announced are touching to 200 millions.

Being an agricultural country, Pakistan is also facing the problem of food insecurity. According to the National Nutrition Survey 2011, 60% of the total population was facing the problem of food insecurity and almost 50% women and children were undernourished. 80 Districts of Pakistan including Jhang out of the 120 were observed suffering from food insecurity (Khan and Gill; 2009).

Severe floods in the era of 1973, 1992 and 2010 and droughts in 1998, 2000 and 2001 has been a serious cause of food insecurity in Pakistan. The government has taken the steps of procurement prices to abstain consumers from highly food prices. The sufficient food supply at reasonable prices is on the basis of food security policy of all countries. Pakistan has appreciable struggle in the prospective of growing supply of food items. Per capita accessibility of specific

products extended from 120 in 1961 to 137 kilograms 1990-1991 and further enlarged to 154 kilograms in 2008-2009 (Yasin; 2000). Average availability of calories per person in Pakistan is significantly lower than the average of other developing and developed countries by 10 percent and 20 percent respectively.

Agriculture performance is largely affected by extraordinary droughts. In addition to the scarcity of rain, there are two more accountable reasons for droughts i.e. increase in temperature and removal of ground water. Extremely expiries ratio and declining in the mass of livestock have noticeably reduced the revenue of the individuals in the famine-affected areas. The charges of nutrition merchandisers have increased in the previous rare years, consequently, revenue of the prejudiced persons and their calories intake in rain-fed regions decreased. There is noticeable discrimination between female and male in Pakistan in the health position. It is reality that the female death ratio is 12 percent more than teenagers' boys (Laffan, et al. 2008).

Food security has been described in multiple ways by many authors and institutions but the most affirmative definition is "it means the food that is provided to every person at every time, that they have resources of purchasing to it, that it is nutritious enough in the perspective of amount, superiority and variety and that is accepted inside the assumed values (Muhoyi, E. et al. 2014).

In other words, the mentioned above definition confines four pillars of food security; food availibity, food access, food utilization and food stability (Peerzada, W. 2004). In this respect, a research was conducted to assess the elements of food security in pastoral districts of all four provinces of Pakistan comprising Fata, Northern Regions and Azad Jammu and Kashmir. For this purpose, 120 rural districts were selected from the selected regions of Pakistan. The results showed that 40 districts out of 120 districts had food security while other 80 districts were food insecure. The study also analyzed the three aspects as nutrition convenience, approachability and engagement which dogged the nutrition safety in rustic districts of the country (Khan and Gill 2009).

Food security was determined by many socioeconomic factors. At different stages of household age and for household head, food security varied as one empirical study examined that food insecurity problem was highest inside the series of 61-70 years at 0.58 and fewer inside array 21-30 ages at 0.30 and the households which run under the female headed homes were supplementary nourishment unconfident at 0.49 than Male-headed homes at 0.38. The empirical results also indicated that there was a negative association between age of household heads and food insecurity scenario (Titus et al. 2007). Household size, income level and education level were also considered key respondents of food security. Different studies indicated that large household size, low income level and low level of education has negatively association with food security position (Bashir et al. 2010) (Haddad, L. E. et al. 1994). One of them resulted in a progressive association between level of schooling and nourishment safety prevalence (Titus et al. 2007).

A comprehensive study was carried out to identify the local compassion of Pastoral Homes Nutriment Safety in three regions (South, Central and north) of the Punjab Province of Pakistan. The data was collected from 1152 households out of 12 Districts from these regions. The stratified sampling technique was applied during the sample size data. It was analyzed that 31% Proportion of the sample households was highly food insecure in the central region as compare to 13.5% and 15% households in South and North regions, respectively. The results of the econometric model indicated that livestock assets, positive association with food security in all these three regions whereas family size has a negative association. The twelve years education and fourteen years education improved food security situation in North and Central regions, respectively. In the north regions, total number of income earners in the households also positively association with food security while age of household head has negatively association with food security (Bashir et al., 2013).

The nourishment safety condition was also observed varied keeping in view rural and Peri urban regions. One study was conducted to find out the determinants of food insecurity, especially socio-economic, in rural and peri-urban areas of the district Faisalabad. Its empirical results showed that food security situation was better in rural areas as compared to Peri-urban areas due to the self-production (Bashir et al. 2012 & 2013) and (Kiani and Sultana; 2011). They also concluded that livestock assets, level of education, economically active members in household, income of household head, tenancy status had a progressive influence on the domestic nourishment safety. Oldness of the household head, family size and expenditures in the form of transfers had adverse influence on the domestic nourishment sanctuary.

The later study also highlighted that educational achievement of family head above 12 years education has also important and optimistic influence on nutrition sanctuary position of household at domestic standard in Pakistan.

Arene et al. (2010) presented a study to examine determinants of food insecurity in Ogbomoss Metropolis of Oyo state, Nigeria. In this study, the number of livestock owned was considered less important in determining food insecurity and also approved that there was a need of more trained and well equipped workers for improving the agricultural technologies that had the capacity of increasing efficiency in food crop production, which improves food security.

An empirical study conducted on the elements of the nourishment safety position of homes getting government donations in Kwakwat; South Africa also included total household income, the household head, and employment status of the spouse as major factors of nourishment safety. It also concluded that domestic magnitude and the married position of the head of domestic head inversely associated with household food security (Sekhampu 2013).

Similarly, a study on nutrition safety elements was organized in three city areas in Cross River states like Calabor, Ikom and Ugep. The logistic regression result exposed that ages of prescribed education, agricultural understanding, oldness of farmers, farming as major occupation, household size, income from farm and productivity of food crops harvest were main factors of nourishment safety position of city agriculture families in the research area (Omotesho et al. 2006).

A study on factors of domestic nourishment safety in the Sekyere-A farm plains District of Ghana was conducted to incorporate farmhouse extent, off-farm revenue and credit admittance as key determinants for home's nourishment safety. It also concluded that the larger households were more food insecure as compare with households with smaller sizes keeping in view previous studies (Thomas et al. 2013). Another comprehensive study included ten variables in the model which were household size, farmland size, farmland quality, climate adaption and livestock ownership in Murehwa District, Zimbabwe.

As previous studies, McCracken, V., & Brandt, J. (1987) carried out a research to discuss the elements of domestic nourishment safety. The study analyzed that good quality land, large farm size has positive relation with positive security. However, larger households have negatively association with food security.

Following the prior literature, this research is carried out 1) to find out the socio-economic determinants of food security in District Jhang 2) to give the suitable policy in the light of our findings.

Materials and Methods

The main focus of this investigative research is to assess the socio-economic determinants of food security in district Jhang, Punjab, Pakistan. The reason for choosing district Jhang is that it is one of the largest districts of Punjab, Pakistan and facing food insecurity problem.

Data

The proposed study was based on primary data and the data was collected from rural areas of district Jhang. The size of the sample was 200 households. In this research, Proportionate random sampling was used. The 120 respondents were from tehsil Jhang and 90 were from tehsil Shorkot and 60 were from Ahmed Pur Sial and 30 were from Attha-Hazri.

Variables

The food security was taken as a dependent variable and it was subdivided into two categories (1=Secure, 0=Does not secure). Its status was calculated through the Calorie Intake Method (CIM). The per capita calorie was compared with Government of Pakistan standard calorie and if a person takes 2450 or more calories per day, he is food secured (Economic Survey of Pakistan, 2013). The independent variables of the interests in this study are the age of household head education of Household Head, number of Family members, family Structure, gender of household head, total animals, negative Shocks, total Earning Hands and tenancy Status etc.

Logit Model

Logit model was used when dependent variable was in qualitative form. If dependent variable has two categories or binary then Binary logit model will be used and when dependent variable has more than two categories then Multinomial logit model will be used.

$$P_i = E\left(Y = \frac{1}{X_i}\right)$$
$$= \beta_0 + \beta_1 AGEH + \beta_2 EHH + \beta_3 NS + \beta_4 NFM + \beta_5 FAMS + \beta_6 GHH + \beta_7 TA + \beta_8 TENST + \beta_9 TEARH \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Y=1 means if a person secure the food. But now consider the following representation of consumer.

$$P_i = E\left(Y = \frac{1}{X_i}\right)$$
$$= \frac{1}{1 + e^{-(\beta_0 + \beta_1 AGEH + \beta_2 EHH + \beta_3 NS + \beta_4 NFM + \beta_5 FAMS + \beta_6 GHH + \beta_7 TA + \beta_8 TENST + \beta_9 TEARH)}} \quad (2)$$

For ease of exposition, we write the equation (ii) as:-

$$P_i = {}^{1}/_{1 + e^{-z}} = \frac{e^z}{1+e^z} \quad (3)$$

Where $zi = \beta^0 + \beta^1 AGEH + \beta^2 EHH + \beta^3 F1 + \beta^4 NFM + \beta^5 FS + \beta^6 GHH + \beta^7 TLA + \beta^8 TSA + \beta^9 TEARH$ *(Gujrati, 2002)*

Equation (3) is called logistic distribution function. It is relaxed to confirm that as Z_i ranges from -∞ to +∞, P_i series between 0 and 1 and that P_i is nonlinearly associated to Z_i(i-e X_i) thus satiating the two necessities reflected formerly. But it appears that in satiating these necessities, we have generated an approximation problem because Piis nonlinear not only in X but also in the β's as obvious in equation (2). This means that we cannot use the analogous OLS process to estimate the parameters. But this problematic is greater seeming than actual because equation (ii) can be linearized as follows:-

If P_i, the chance of being food secure to a person is given by equation (3) then (1- P_i), the possibility of being a person does not secure the food is:-

$$1 - P_i = \frac{1}{1+e^{z_i}} \quad (4)$$

Consequently we can write:-

$$\frac{P_i}{1-P_i} = \frac{1+e^{z_i}}{1+e^{-z_i}} = e^{z_i} \qquad (5)$$

Where, P_i/ (1-P_i) are simply the odds ratio. If we take the natural log of equation (v), we attain a precise interesting outcome, namely:-

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = z_i = \beta 0 + \beta 1 AGEH + \beta 2 EHH + \beta 3 NS + \beta 4 NFM + \beta 5 FAMS + \beta 6 GHH + \beta 7 TA + \beta 8 TENST + \beta_9 TEARH$$

That is L, the log of the odds ratio, is not only linear in X, but also linear in parameters. L is called the Logit, and hence the name Logit model.

Results and Discussion

The basic emphasis of the study was to find out socio-economic determinants of food security. The empirical analysis has been completed by utilizing the logistic regression model.

Table 1: Results of Binary Logistic Regression

Variables	Description	Label	Coefficient	Sig	Odds Ratio
Age of Household Head	Age of Household head (0=20-50, 1=above50)	AGEH	-1.291	0.046**	0.275
Education of Household Head	Education of Household head (1=illiterate, 2=up to intermediate, 3=Above intermediate)	EDUHH (1)	-1.918	0.004*	0.147
		EDUHH (2)	-1.415	0.039**	0.243
Negative Shock	Negative Shocks(1=shocks,0=no shocks)	NS	-1.170	0.034**	0.310
No. of family Members	No. of family members (1=2-6,2=7-10,3=above10)	NFM(1)	2.818	.000*	16.741
		NFM(2)	1.829	.005*	6.226
Family structure	Family structure (1=joint, 2=nuclear)	FAMST	.005	.993	1.005
Gender of Household Head	Gender of Household head (1=male, 0=female)	GHH	.256	.655	1.292
Total Earning Hands	Total Earning Hands	TEARH	-.085	.049**	.918
Tenancy Status	Tenancy status(1=Owned area, 2=rented in area,3=both,4=none)	TENST(1)	1.926	.005*	6.864
		TENST(2)	1.585	.062***	4.878
		TENST(3)	3.027	.002*	20.641
Total Animals	Total animals(1=0-2,2=3-5,3=above5	TA(1)	-1.086	.109	.338
		TA(2)	-.228	.786	.796

* 1 % level of Significance ** 5 % level of Significance *** 10 % level of Significance

It has been found that age of household head has a negative and significant impact on food security because the efficiency of work decreases as age increases. The age of household head which is above 50 years has 0.725 times fewer chances to be food secured

A negative and significant association between uneducated (illiterate) people and food security is seen because uneducated people have insufficient resources to improve themselves. These people have 0.853 times less chances of food security. It is also found that up to intermediate educated people had negative and significant relations with food security and these people has 0.74 times less chances to food security. The reason is that twelve years educated people have less opportunities of earning because this education was not a higher education.

There is an inverse and significant relationship between food security and negative shocks because they result in an imbalance between demand and supply and caused poverty and unhappiness. The people with negative shocks have 0.69 times less chances to be food secured.

It has also been found that family members between 2-6 and 7-10 have positive and significant impact on food security and they have 15.741 and 5.226 times more chances of food security because the lagers no of family members has greater opportunities of earning.

The family structure and the role of gender of household head have insignificant impact on food security. The total earning hands have positive and significant impact on food security. They have 0.082 times more chances to food security because large number of family members have more options to availing resources and livelihood. A positive and significant impact of owned area people on the food security is observed because they enjoy prosperity and happiness much more in daily life and they have 5.864 times more chances to be food secured. The rented area has positive and significant relationship with food security. It has 3.878 times more chances of food security due to utilizing their expertise in the different fields and as a result they enjoy a happy life. A positive and significant association is also seen between food security and household who have both owned and rented area because both categories of land entities fell under sincerely work day and night in the field. They have 19.6 times more chances to food security. There is no role of total animals in the determination of food security because the animals require heavy expenses to look after.

Conclusion

The sound food security position of any nation presents the gauge of economic growth. It is cleared that disappointment and disparity can be abolished only by the way of provision of food and nourishment. It is the basic right of human being to be food secured and it is the only possible way to get by justice in distribution in the society.

This research identified the socio-economic factors influencing food security status in the rural areas of District Jhang, Punjab. Empirical results showed that gender of household head, family structure, education of household head, tenancy status, no of family members had a positive effect on food security status. There is a significant role of above mentioned variables in determining food security situation. According to many studies, there should be emphasis more on these variables in order to improve food security status because these features have unavoidable position in defining the food security (Bashir et al., 2013).

Age of household head, total earning hands, total animals and negative shocks had the negative effect on food security position. By clarifying the results discussion, it has been cleared that some variables are much significant and some others variables are less significant. However, it is repeatedly said that significant steps are essential for enhancing the food security situation.

Recommendations

Keeping in view of the results, following suggestions are presented to the ministry of food and agriculture for bringing an improvement in the condition of food insecurity situation in rural areas particularly.

1 Loans schemes at low interest rate should be launched by state bank of Pakistan so that people poor could earn money and to be food secured.

2 There is a need of policies to reduce the prices of inputs; to discourage the divergence of agricultural land; and to subsidize the farmers on the supply of grains and food. These steps would result in food secured farmers.

3 Number of family members is also a significant factor in determining the food security but it has negative effect on food security. The better family planning should be initiated in order to make ideal family size food secured. The government should start campaign about awareness regarding ideal family size particularly in the rural regions.

4 The negative shocks have negative impact on food security. The natural negative shocks are unpreventable, but timely information about them can reduce their losses. The disaster management department should install protective measures in order to save their possessions. There should be modern technology in forecasting the weather condition.

5 Female common and health education should be improved by government education department.

6 The price control government institution should make food prices stable. The government should nominate food prices in the market.

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