

Determinants of Food Poverty States (FPS) in Pakistan

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ABSTRACT

Aim of the Study: Food security is one of the major issues facing developing nations like Pakistan. This study made an effort to investigate the key factors that influence various levels of food poverty.

Methodology: Various states of household food poverty are calculated by integrating the two measures of food security, per capita food expenditures (Food Exp) and average dietary energy consumption (ADEC), which represent food affordability or availability and accessibility respectively. The combined two indicators can be further categorized into four possible states of food insecurity, including food security (on the base of both indicators), food insecurity on the base of only food expenditure, food insecurity on the base of only ADEC, and total food insecurity (on the base of both indicators). HIES data for 2018–19 is used by incorporating a multinomial logit model to conduct the empirical investigation.

Findings: Empirical findings are likely to verify the presence of various states of food poverty/food insecurity issues that need to address properly. The empirics also show how the impacts of household socioeconomic characteristics vary considerably among the various food poverty states defined for the investigation.

Conclusion: It is concluded in order to ensure human wellbeing and to plan food security strategies to address this hot issue, it is crucial to understand the causes of household food poverty states.

Keywords: Food Poverty, Food Affordability, Food Availability, ADEC, Food Expenditure, Household.

Introduction

Food is a basic daily need for growth of life and physical function of human body. Access to food is basic human right. Malnutrition or food poverty reduces the productivity of an individual undermining national productivity and economic growth. It breeds crimes and social evils, while food security helps to enhance national stability through increased productivity which resultant in rapid economic growth. Food insecurity remains a key problem in development discourse across the world, as it undermines people's productivity, health and even their survival (Smith and Subandoro, 2007). It generates negative effects on physical, mental and social health (Grimaccia and Naccarato, 2020). It exhibits worse impacts across the

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lifespan of an individual resulting in poor nutrition and diet intake which translates in severe negative health consequences and even in social isolation (Kleve et al. 2021)

Food insecurity is universal issue. According to Pollard and Sue (2019), household food security is also a serious issue with reference to public health of developed countries like Australia, Newzeland, united Kingdome, Canada and United States because of inequality. It indicates that social protections are not sufficient and indicating the ineffective government policies.

Most of the developing countries are struggling with the issue of food insecurity. The sensation is most stroked in the countries with low income and Pakistan is one of them. Pakistan is graded at 99 number (GFSI, 2022) in Global Food Security Index of 2022 from total of 121 countries. With the score of 26.1, Pakistan has a serious and alarming level of hunger. Tharparkar is of the poorest and most malnourished regions in the world placed in the Sindh Pakistan. Most of the land in the area is desert, people depends on seasonal rainfall (FAO, 2016). Pakistan is one of the third world countries where daily millions of people have to sleep without having appropriate meal. The country is having fertile land with adequate water, climate and weather which are agriculture-friendly. Similarly, it is nuclear power and the industrial sector is making decent progress. Despite these, incidences are reported that due to hunger mothers sells their kids, and of children are dying because of illness due to nutrient insufficiency (Talpur, 2016).

How much a nation is poor or wealthy can be gauged through the level of food consumption of its residents. Hence, poverty line can be defined on the basis of food consumption level. When people have access to food, it means they have the means to support a vibrant, active lifestyle that includes sufficient food consumption according individual's requirement (Ullah et.al,2022).

Significance of the Study

To investigate the food poverty states in the country, the study is presenting the novel idea by combining two food security pillars, food availability and accessibility (representing respectively by the Average Dietary Energy Consumption(ADEC) and food Expenditure (Food Exp)), which represent both food demand as well as the supply side at household level. In Most of the studies, conducted for Pakistan are based on Dietary Energy Consumption (represents availability) which captures the supply side only at household level. The study is using the household food Expenditures along with (ADEC) which represent the accessibility, covers the demand side as well at household level. So the study will attempt to capture the both supply and demand side at household level.

This study is important and can be beneficial for targeting and pursuing different sorts of interventions to target different groups of individuals and households with different categories of food insecurity and welfare issues, as food insecurity indicators and social welfare indicator are synonymous to each other. So understanding the connection between indicators of household food insecurity and socio economic features of household is important for policy formulation and to design the intervention plans. Most helpless and vulnerable members of society could be helped to come out from trap of food poverty and food insecurity to a better state of food security.

In contemporary situation food poverty is one of the crucial issues which indulges the whole world in pain and in the worst situation of emotional well-being. So it is need of hours to take in consideration important factors in context of the food poverty which is the main motivation and significance of this study.

Objective of the Study

Main objective of this study is to explore the determinants of food poverty states in Pakistan.

Literature Review

Various theoretical approaches have played role in formulation, revision and extension in the description of food insecurity. However, two theoretic approaches Food availability and Entitlement approach played

key role in this regard. The first approach “food availability” approach is linked with “An Essay on the Principle of Population,” by Thomas Malthus published in 1798. He presented his theory on altering aspects of population and its connection with the obtainability of resources. According to Malthus the growth and progress of human was strictly restricted because of the burden that growth of population put on the accessibility of food. This methodology was predicted on the equilibrium and disequilibrium between population and available food. To sustain this equilibrium, the progress and pace in food production should not be slighter than the rate of population growth. This approach took massive attention at both political and academician level until early 1970s. This approach gave dual policy implications. Proceeding the “demand side”, there is need to decrease fertility rate by reducing the growth rate of population through correct policies whereas on the “supply side”, the need to rise food production by boosting agricultural sector. For this purpose, generally recommended and implemented prime policy is to rise agricultural yield. Malthus assumed that the population is increasing at higher rate than supply of food. This shows that population increases at a geometric rate, while the production size grows arithmetic rate, resource will be scarce in that country and would be difficult to cope with growing number of population and resultant in food insecurity. This approach that food insecurity is due to short fall of food was challenged by second approach “Amartya Sen’s entitlement approach”. This second approach emphasis that people face food insecurity because of their incapability to obtain the food regardless that of food is available (Devereux, 2006). People faces starvation, does not indicate that there is lack of food to meet their needs. At the theoretical ground, Amartya Sen’s 1981 essay on deprivation and entitlement postulated that food insecurity is mainly a demand side issue than supply distress. This line focusses on each individual’s entitlements to goods bundles which also includes food. So famine is result from a deprivation to be entitled and attained any package including abundant food. Main appreciated input of this approach related to food insecurity theorization is that it moves the analysis attention away from mania on food supplies, Malthusian view point “too many people, too little food” and on to the failure of masses to obtain food. So, Food insecurity hits individuals who are not able to access satisfactory and sufficient food due to lack of resources despite availability of sufficient food. This perception is that food insecurity can happen even if food availability is satisfactory and markets are operative in well manner.

A number of approaches are used for calculation of the food insecurity measure to identify the factors of household food insecurity position (Ayantoye et al. 2011). “The Cost of Basic Needs (CBN) approach, the Food Energy Intake (FEI) method” adopted by Greer and Thorbecke (1986), “the expenditure method, the per capita daily calorie intake method, dietary diversity measures” and others.

As for as concerned to Pakistan number of studies investigated the determinants of food security/ insecurity for Pakistan, over the period of time. Some studies from Pakistan comprise; Shaheen et al. (1991), Ahmad et al. (1995) Khalid et al. (2005), Ahmad (2009), Ahmad and Farooq (2010), Nadeem et al. (2016), Bashir et al. (2012), Asghar and Muhammad (2011), Asghar et al. (2013), Ishaq et al. (2018) and others.

Empirical evidences regarding food insecurity and poverty are presenting alarming situation. Mahmood (1991) explored the issue of malnutrition and poverty in Pakistan. It revealed that 2 percent urban households and 3 percent the rural households were fall in the category as “Real Poor” households, while 59 percent households and 35 percent rural households have been recognized as “less poor”. “Real Poor” households were discriminated from “Less Poor” on the base of lower buying power. The marginal propensity to consume (MPC) for food was zero or negative for “Real Poor” and positive for “Less poor”.

Likewise, Ahmad et al. (1995) also presented an alarming and alternative scenario to assess the situation as well as calculate the future need for important food crops. The study reveals that if appropriate policy measures are not adopted then the insufficiency of wheat is predictable to raise manifold by 2010 and the same is the issue for maize. Side by side by due to changing food customs of individuals and relative injustice in income distribution, rice for export purpose would be decline in the upcoming 15 years. This reflects a distressed food security situation which needs instant attention. Khalid et al. (2005) investigated the issue of food poverty in Pakistan for national level and further decomposed at the urban, rural level to

find out its important determinants including impact of credit, loans and financial assets on food poverty. Results identified that at the national level, on average 40 percent of households are falling lower than poverty line. Poverty is relatively high in rural areas, with 46 percent of the households, whereas in urban areas 41 percent of households are food poor. Determinants of food poverty in Punjab are investigated by Sidhu & Vatta (2008) and revealed that only increase in production alone cannot ensure food and nutritional security. The household with low income are being more exposed to it. Income and employment opportunities for more poor and vulnerable segment of the society are expected to help to lessen their food insecurity and malnutrition.

Asghar (2011), analyzed the issue and found that 35 percent people are food insecure in Pakistan in general. It is revealed that urban food insecurity is higher at 40 percent relative to rural food security at 34 percent. Bashir et al. (2012) also investigated the situation of food security for the landless rural households of the Punjab. Around 27% households from the sample were identified to be food insecure from 576 landless households. Monthly income and education level of household head have positive impact, while the family size and the household head age were negatively correlated with food security of the household.

Furthermore, Asghar and Muhammad (2013) examined the factors causing food insecurity for general household and farmer both using PSLM (2007-08) survey. Study revealed that 50.4 percent households were food insecure. Food insecurity among urban households is 52 percent compared with 48 percent among rural households, relatively less as previous study found on the other hand 39.5 percent among farmer households were exclusively food insecure. Sindh, with 60 percent, is revealed to be highest vulnerable and food insecure region in the study. Same issue is also addressed by Nadeem et al. (2016) with reference to Punjab. It is concluded that low purchasing power, low education, large number of dependents and large household size are the main factors affecting malnutrition or food poverty.

Similarly, during the period of 2004-16, the area wise and quintile analysis and trends in prevalence of food insecurity is investigated by Ishaq et al. (2018), using seven rounds of HIES (2004-16). Result shows that there is fluctuation overtime in food insecurity trends at national and provincial levels. It has an increasing trend during 2004-08 and 2011-14 and a decreasing during 2009-10 and 2014-16.

Data & Variables

This study used Household Integrated Economic Survey (HIES) data for year 2018-2019. There are many social, economic and demographic factors that can be a reason a household to be fall in different states of poverty. Economic factors can be household income, employment status, occupation, land ownership and other all financial assets like house occupancy status. Education as a social indicator is included in the analysis. The demographic characteristics include sex and age of the household members, and number of household member etc. The description and summary statistics of explanatory variables (continues variables) is given bellow in the Table 1 and 2 respectively.

Table 1: *Variables Description*

Variables	Description
Monthly Income	Average monthly income of the household in Pakistani Rupees
Land Ownership	If has own land = 1 , 0 Otherwise
House Occupancy Status	
Own House	If household resides in own house = 1 , 0 otherwise
Rented House	If household resides in rented house = 1, 0 otherwise
Subsidized rented House	If household resides in house with subsidized rent = 1, 0 otherwise
Rent free House	If household resides in rent free house = 1, 0 otherwise
Employment Status	

Employer	If employer = 1,0 otherwise
Self Employed	If self-employed = 1,0 otherwise
Paid Employee	If paid employee = 1,0 otherwise
Agriculture	If occupation is agriculture = 1,0 otherwise
Family size	Number of family members living in a household
Education	Education of the household head in years
Gender	If gender is male = 1,0 otherwise
Age	
Age :>1-17	If age of the household member is from >1-17 years = 1, 0 otherwise
Age :18-40	If age of the household member is from 18-40 years = 1, 0 otherwise
Age :41-65	If age of the household member is from 41-65 years = 1, 0 otherwise
Age :66-99	If age of the household member is from 66-99 years = 1, 0 otherwise
Region	If urban =1,0 otherwise

Table 2: *Summary statistics of the Explanatory variables*

Variables	Mean	Standard Deviation
Monthly Income	34508.28	3.620586
Family size	7.40205	3.682138
Education	8.659248	3.832196
Age		
Age <1-17	7.547906	5.007439
Age :18-40	26.6154	6.676353
Age :41-65	52.97621	6.70692
Age :66-99	74.40197	6.952598

Methodology

Household food poverty states are developed by combining the two measures, per capita food expenditure (Food Exp) and average dietary energy consumption (ADEC), which represent food affordability or availability and accessibility respectively. The two combined measures or indicators can be further divided into four different food poverty states, complete food insecurity state (on the base of both indicators), food insecurity on the base of ADEC only, food insecurity on the base of food expenditure only, and state of complete food security (on the base of both indicators). Given this, this study intentional to find out household's socio economic variables, play an important role in food poverty states perspective.

Food Security Indicators in the Study

As described above the analysis is designed to combine household per capita food expenditure and ADEC to quantify the household food-poverty states. The details of measures are given below.

Per Capita Food Expenditure (Food Exp)

The literature has well-documented the usage of per capita food Expenditure (Food Exp) as indicator to measure food security at household level [(Smith and Subandoro, 2007), (Faridi and Wadood ,2010), (Heady and Ecker, 2012)]. Expenditure on food is considered as significant indicator of food security because it takes in account the notion of vulnerability to food insecurity and which is used as a proxy for poverty at household level. Higher proportions of food Expenditures are crucial factor of intertemporal vulnerability to food insecurity (Faridi and Wadood, 2010). In literature a number of studies were constructed food-poverty line or food security line in term of household per capita expenditure along 2/3 of weighted mean of per capita expenditure to be considered as threshold. Canagarajah and Thomas (2001), Omonona and Adetokunbo (2007), Kuku and Liverpool (2010), Adepoju et al. (2015) and

Adebayo (2016) too have used this threshold level. The observed household is considered food insecure (or food secure) when per capita food Expenditure is less (or greater) than 2/3 weighted mean of per capita expenditure. So food secure household is defined as one whose per capita monthly food Expenditure remains equal or above to two third of mean per capita food Expenditure. The food security measure is as given below;

$$F1_i = \frac{\text{per capita food Expenditure for the } i\text{th household}}{2/3 \text{ mean per capita food Expenditure of all households}} \dots\dots\dots(1)$$

Fi indicates Food security index, $F1 \geq 1$ = food secure household, $F1 < 1$ = food insecure household. Same approach is often used by World Bank to investigate household poverty in the less developed countries in the world (Canagarajah and Thomas, 2001). Directed by past literature, the study used the threshold as two-third of the mean monthly expenditure on food as food poverty line to identify whether households are food secure or in given sample.

Average Dietary Energy Consumption (ADEC)

Per capita average dietary energy consumption of household is an indicator which calculates calorie consumption by an individual on average. To form this indicator, current household expenditure and consumption surveys data can be used, based on the entire sum of food acquirement or consumption by the household. Individual household's described consumption of foods is transformed into dietary energy (kcal) by matching distinct foods with a Food Composition table. The ADEC is calculated by accounting for the serving bought or consumed divided by the entire number of persons in that particular household. If data are collected for number of days or if recall periods is for more than one day, the calculation of ADC require to be divided by the number of days of recall to form the number of calories per day by per person.

HIES Pakistan provides food consumption statistics at household level only, but the consumption need of food varies for the individual by sex and age. The number of "adult equivalents" is used to adjust for sex and age variances between them. Each individual in the household is allotted an adult equivalent factor that compare and relates his or her energy requirements with the adult energy requirement per person per day (2350 kcal) for moderate activity. Calculation of sum of individual household's adult equivalent size is done through Equation 2 given below.

$$AE_N = \sum_{i=1}^N AE_i \dots\dots\dots(2)$$

Where AE_N shows household total adult equivalent size and AE_i is equivalent factor of an individual where $N = 1, \dots, N$

Each household member's adult equivalent factor or size is picked up from equivalence scale specified in "Poverty reduction strategy paper Pakistan [PRSP-I (2003)]"

Table 3: *Equivalent factor*

Age (years)	Daily Requirement of Energy per Person	Equivalent Factor
Children		
<1	1010	0.429787
01-04	1304	0.5548936
05-09	1768	0.7523404

Males		
10-14	2816	1.1982978
15-19	3087	1.3136170
20-39	2760	1.1744680
40-49	2640	1.1234042
50-59	2460	1.0468085
60+	2146	0.9131914
Females		
10-14	2464	1.04851063
15-19	2322	0.98808510
20-39	2080	0.88510638
40-49	1976	0.84085106
50-59	1872	0.79659574
60+	1632	0.69446808
National average	2350	1

Source: “PRSP-I (2003).”

To find out the average dietary requirement we divide total calories consumed by a household to the sum of the respective household equivalent factor

$$ADEC = \frac{tkcl}{AE_N} \dots\dots\dots(3)$$

ADEC is matched with minimum dietary energy requirement (MDER) or individuals to make decision about a specific household whether he/she is food secure or insecure. If $ADEC < MDER$ household would be considered as food insecure and if $ADEC > MDER$ household is food secure. According to FAO (2008), MDER of a distinct individual is described as the cut off threshold caloric intake, a person would have to take to achieve a minimum standard weight for height to keeping a healthy life to perform moderate level of physical activity.

This is measure of the diet quantity taken and insights an estimate of the energy accessible to a household. It can be used to evaluate the food insecurity of a people in order to plan a suitable policy intervention to overcome the issue (Smith & Subandoro, 2007).

Household Food Poverty States (FPS)

Using predetermined threshold discussed earlier we derive FPS by combining Food Expenditure and ADEC to categorize households into mutually exclusive states of food poverty. The four states are identified as; The four states are identified as; state of complete food insecure (evident from both indicators), transitorily food insecure state on the base of ADEC but food secure on the base of Food Exp, state of transitorily food insecure on the base of Food Exp but food secure on the base of ADEC and complete food secure state (evident from both indicators).

We construct FPS_i as discrete numbers in such a manner that a households in complete food insecure state identified through both indicators have FPS=3, households in state of transitorily food insecure on the base of ADEC and food secure on the base of Food Expenditure has FPS=2, households in state of transitorily food insecure on the base of Food Expenditure and food secure on the base of ADEC has FPS=1 and households in complete food secure state evident by both indicators have FPS = 0. So the discrete variable represented by the FPS is dependent variable investigated in the study. Conferring to Rose and Bliemer (2008), when dependent variable has more than two discrete possibilities, such sort of regression is a generalization of the “logistic regression” technique. Therefore, the study used a multinomial logit model (MLM) to evaluate food poverty states of household.

Results and Discussion

The study used two food insecurity measures or indicators, average diversity energy consumption (ADEC) and food Expenditure (Food Exp), which represents food availability and food accessibility, respectively. The Likelihood Ratio Chi-Square in the model was significant as the ($p < 0.000$) which is used to test that at least one of the coefficient of explanatory variables was not equal to zero in given model. So null hypothesis is rejected that all regression coefficients in the model are all together equal to zero which shows the goodness fit of the model and rejection of the collective model.

Determinants of Food Poverty States

The impact of socioeconomic structures of household on the different states of food poverty is found out in present study. The multinomial logit model is estimated for the purpose and the Table 4 presents the outcome of odds¹ ratio from the estimated model. The coefficients given below are the odds ratio of a household's presence in the state of transitorily food insecure or completely food insecure compare to state of complete food secure household based on household's socio-economic features or characteristics. The odd ratios of the coefficients show the risk of the outcome in the assessment group relative to the risk of the outcome dipping in the base category (food secured based on both measures) due to change in explanatory variables. The value of odds ratio greater than one designates that the risk of the outcome existing in the comparison or assessment group comparative to the risk of outcome dipping in the base group rises as the value of predictive or independent variable increases, shows positive association and vice versa .

Table 4: *Estimation results through MLM*

Explanatory Factors	Odds ratio of food insecure household on the base of Food Exp only		Odds ratio of food insecure household on the base of ADEC only		Odds ratio of complete food insecure household identified by both Indicators	
	Odds Ratio	Standard Error	Odds Ratio	Standard Error	Odds Ratio	Standard Error
Log of Monthly Income	0.0050 ***	0.0002	0.6731***	0.0103	0.0056**	0.0002
Land Ownership	1.107 ***	0.0301	1.082 ***	0.0206	1.202***	0.0301
House Occupancy Status						
Rented	0.3577	0.0175	1.014***	0.0243	0.4382 ***	0.0191
Subsidized rented	1.164 **	0.01385	1.156	0.0750	1.330 ***	0.0145
Rent free	1.112***	0.0493	0.7040***	0.0257	1.015 ***	0.0421
Employment Status						
Employer	0.0701	0.0238	0.8594 ***	0.0866	0.0850***	0.0274
Self-Employee	0.8558*	0.0448	1.065**	0.0364	0.9604	0.0468
Paid Employee	0.9849 ***	0.0271	0.9141	0.0176	1.007	0.0258
Agriculture	1.556 **	0.0959	1.085	0.0581	1.349***	0.0802
Log family size	0.1308***	0.0042	6.305 ***	0.1378	1.088 *	0.03334
Education	0.8588***	0.0111	0.0071 ***	0.9598	0.9077 ***	0.0111
Gender	1.023***	0.0249	1.1090	0.0182	1.040*	0.0232
Age						
Age :18-40	0.9190***	0.0255	1.086***	0.0199	0.9293***	0.0237
Age :41-65	0.7926***	0.0270	1.086 ***	0.0256	0.8828***	0.0279

¹ Value of odds ratio >1 indicates positive relationship between predictor and predicted estimating K-1 model and vice versa.

Age :66-99	1.437 ***	0.0841	1.226 ***	0.0508	1.650***	0.0870
Region	0.2787 ***	0.0078	0.7867 ***	0.0135	0.2971*	0.0077
LR chi2(48) = 129908.45 (p = 0.0000).Base category= food secure based on both indicators.						

(Note: *, ** and *** show significance at 1%,5% and 10% respectively)

Income

Above table indicates that the odds of the household being food insecure on the base of Food Exp only is 0.0050 times less and significant with increase in monthly income relative to completely food secure household in the study. It shows that as the percentage in income of a household increases the food insecurity decreases. Similarly, odds of the household being food insecure on the base of ADEC only and food insecure based on both indicators is 0.6731 and 0.0056 times less respectively and significant with increase in the monthly income, relative to completely food secure household.

Land Ownership

The odds of being food insecure on the base of Food Exp only, ADEC only, and based on both indicators relative to complete food secure households is 1.10, 1.082 and 1.202 times significantly higher, respectively with increase in land ownership.

House Occupancy Status

Three types of house occupancy status are analyzed in the study; household living in rented house, living in subsidized rented houses and living in rent free houses relative to household living in their own houses

Rented Houses. Likewise, the odds of being food insecure on the base of Food Exp only, ADEC only and based on both measures vs household being complete food secure living in rented houses is 0.3577 times lower, 1.014 times higher (significant) and 0.4382 (significant) times lower, respectively than the odds for the households living their own houses.

Subsidized rented Houses. The odds for household being food insecure on the base of ADEC only, Food Exp only and based on both measures relative to household being complete food secure living in rented with Subsidized rented houses is 1.164 (significant) times higher, 1.156 times higher but not significant and 1.330 (significant) times higher, respectively than odds ratio for the households living their own houses.

Rent free Houses. The odds for household being food insecure on the base of ADEC only, Food Exp only and based on both measures relative to household being complete food secure living in houses with no rent is 1.112 (significant) times higher, 0.7040 (significant) times lower and 1.015 times higher (significant), respectively than the odds for the households living their own houses.

Employment Status

Employment status is measured by the people who are employer, self-employed paid employee and the people who are employed in agriculture sector. Different employment status has different effect on poverty states.

Employer. The odds for household being food insecure on the base of Food Exp, ADEC only and complete food insecure on the base of both measures relative to household being complete food secure is 0.0701, 0.8594 (significant) and 0.0850 (significant) times lower respectively if household is employer.

Self-employed. The odds for household being food insecure on the base Food Exp only ADEC only and complete food insecure based on both measures relative to household being complete food secure is 0.8558 times lower (significant), 1.065 higher (significant) and 0.9604 times significantly lower, respectively if household is self-employed.

Paid Employee. The odds for household being food insecure on the base of Food Exp, ADEC only, and complete food insecure based on both measures relative to household being complete food secure is 0.9849 (significant, 0.9141 and 0.9832 times lower and 1.007 higher respectively if household is paid employee.

Agriculture sector Employment. The odds for household being food insecure on the base of Food Exp, ADEC only and complete food insecure based on both measures relative to household being complete food secure is 1.556, 1.085 and 1.349 (significant) times higher, respectively if household is employed in agriculture sector.

Family Size

The odds for household being food insecure on the base of Food Exp only, ADEC only and complete food insecure based on both measures comparatively to household being complete food secure is 0.1308 lower, 6.305 and 1.088 times higher and significant, respectively if household's family size increases.

Household Head Education

In response to increase in household head education the odds for household being food insecure on the base of Food Exp, ADEC only, Food Exp only and complete food insecure based on both measures comparatively to household being complete food secure is 0.8588 0.0071 and 0.9077 times significantly lower.

Gender

The odds for household being food insecure on the base of Food Exp, ADEC only and based on both measures relative to household being complete food secure if the gender is male is 1.023 (significant) ,1.1090 and 1.040 (significant) times higher respectively, relative if gender is females.

Age

The odds for household being food insecure on the base of Food Exp only, ADEC only and based on both measures relative to household being complete food secure ages from 19-40 years is 0.9190 lower 1.086 times higher and 0.9293 times significantly lower, respectively than the odds for the households ages between 1-18 years.

Similarly, odds for household being food insecure on the base of Food Exp only, ADEC only and based on both measures relative to household being complete food secure ages from 41-65 years is 0.7926 times lower 1.085 higher and 0.8828 times significantly lower, respectively than the odds for the households ages between 1-17 years.

The odds for household being food insecure on the base of Food Exp only, ADEC only and based on both measures relative to household being complete food secure age from 66-99 years is 1.437, 1.226 and 1.650 times significantly higher respectively than the odds for the households ages between 1-18 years.

Region

The odds for household being food insecure on the base of Food Exp only,ADEC only and based on both measures relative to household being complete food secure reside in urban area is 0.2787, 0.7867 and 0.2971 times significantly lower respectively than the odds for the households reside in rural areas.

Table 5: Summary statistics of the Explanatory variables identified by food Poverty States

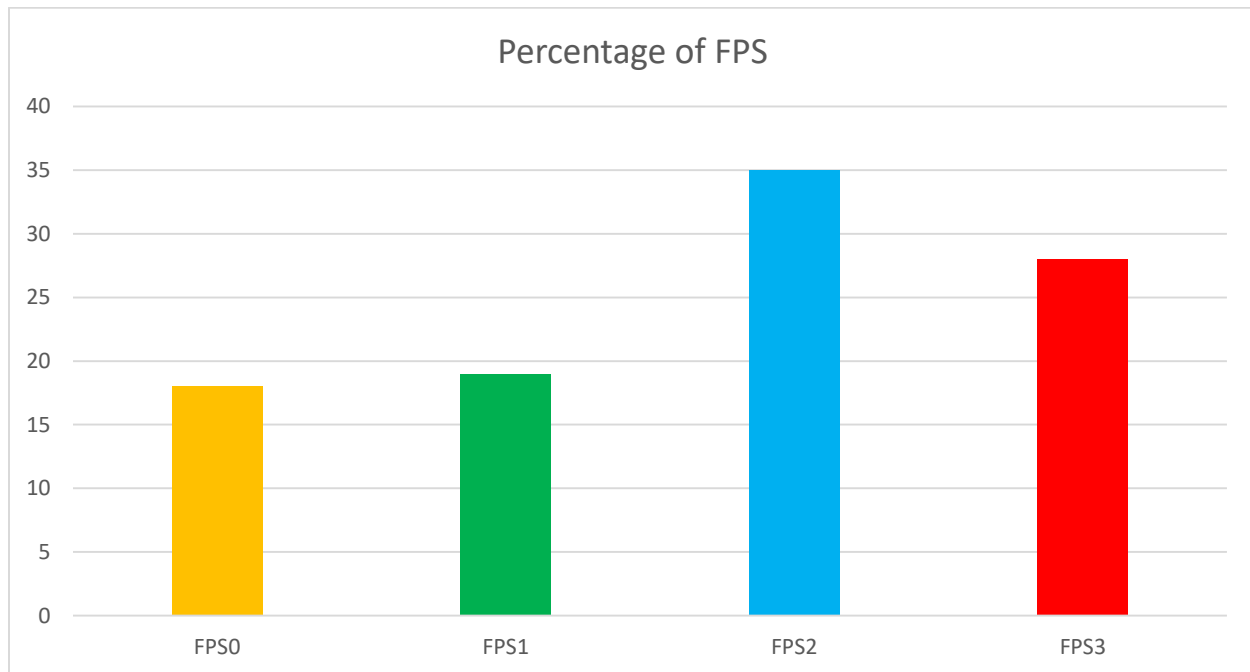
Variables	Food Poverty States (FPS)							
	FPS=0		FPS=1		FPS=2		FPS=3	
	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
Monthly Income	49298.33	39339.16	17151.54	8747.418	47099.18	45867.57	19215.39	10059
Land Ownership	.2147559	.4106607	.234428	.4236484	.2402355	.4272311	.2558587	.436349
House Residency status								
Own houses	1.241951	.6566176	1.215368	.7390002	1.175418	.5727902	1.193979	.7054044
Rented	.2107973	.6141408	.0434314	.2915107	.1514641	.5291414	.0376116	.2716802
Subsidized rent	.8448536	.3620489	.9120365	.283245	.8883837	.3148959	.9212845	.2692969
Rent free	.8448536	.3620489	.9120365	.283245	.8883837	.3148959	.9212845	.2692969
Employment Status								
Employer	.0082436	.0904205	.0004128	.0203125	.0037117	.060811	.0003011	.0173485
Self Employed	.0537525	.2255316	.037584	.1901901	.0436391	.2042921	.0315504	.1748016
Paid Employer	.2266344	.4186595	.2557729	.4362998	.1846176	.3879896	.2127045	.4092244
Agriculture	.0231185	.1502819	.0669128	.2498738	.0247624	.1554012	.0573808	.2325712
Family size	7.102278	3.22881	4.736958	1.921905	9.551374	4.192761	6.620831	2.196851
Education	9.809258	4.045032	7.039813	3.183912	8.725924	3.695759	7.040247	3.318202
Gender	.4296822	.4950372	.3996423	.4898304	.4420908	.4966385	.4159558	.4928909
Age								
Age <1-17	8.809589	4.73678	7.389165	4.617791	8.878903	4.684869	8.132841	4.64363
Age :18-40	26.85775	6.554056	27.21189	6.505269	25.85356	6.548328	27.18568	7.091769
Age :41-65	52.47178	6.671132	53.35316	6.700813	52.07758	6.867728	53.31088	7.071854
Age :66-99	74.78999	6.400601	73.45638	6.111368	75.86466	7.284936	74.63503	6.762149
Region	.4293442	.494989	.1388246	.3457673	.3086947	.4619579	.1102258	.3131741

Discussion

Food Expenditure (Food Exp) and Average Dietary Energy Consumption (ADEC) representing food affordability or availability and accessibility respectively are used to obtain Household food poverty states. The combined two measures are further explained into four probable states of food poverty such as; complete food secure (on the base of both indicators), food insecure on the base of food Expenditure only, food insecure on the base of ADEC only, and totally food insecure (on the base of both indicators).

The study intended to explore the household's socio economic features, which play a vital role in food poverty states perspective. The study examines the factors which determine the Food Poverty states using multinomial logit regression model. Empirical results indicate that about 18%, 19%, 35% and 28% of the households in the specified sample are placed in the state of complete food secure, food insecure on the base of ADEC, food insecure on the base of Food Exp only, and complete food insecure on the base of both indicators, respectively as shown in below chart.

Chart No.1 *Percentage of FPS*



The determinants of food poverty (FPS) states exhibit that odds of being food insecure household comparative to complete food secure households reduces by increase in income, improvement in household head education and households in the urban areas but it rises with increase in household size, households associated only with farm income indicated if engage in agriculture only. Odd of landownership is also pertaining positive pressure in food poverty the possible reason could be that in case of Pakistan agriculture lands are rapidly converted in real investment particularly in housing schemes and other commercial purposes.

Whereas the empirical findings look to support the presence of different types of food poverty/food insecurity issues that need precise essentials. The findings also show how the impacts of household socioeconomic characteristics considerably vary among the various food poverty states elaborated for the investigation.

It is concluded that in order to ensure human wellbeing and for scheming and implementation food security strategies it is essential to address this hot and panic issue. For this purpose, it is essential to understand the components and factors that contribute to household food poverty conditions.

Policy Implications

In the insight of empirical results of the study;

- it is imperative for government to create cognizance, awareness and knowledge on reproductive health and decision about their household size to ensure small household size and dependency ratio by forming health centers with free guidance on these issues.
- Since it is evident that increase in income of the household declines food insecurity, it is vital for government to promote policies that efficiently work to enhance the earnings, receiving capacity and opportunities for the households.
- Farm Status described with occupation in agriculture has negative relation with food poverty in the study despite that the agriculture is major sector of Pakistan. It is need of time to reduce the cost of agriculture production through increasing the farm level supply of authentic and certified

seeds, quality fertilizers and provision of pesticides along with easy institutional credit and appropriate farm machinery.

- Further, it is found that education of the household head is a crucial factor to increase household food security. Government should launch policies to improve the education not only the for head of the household but education of females should be also encouraged particularly the women in rural areas.
- Pakistan is agriculture country there is need to investment in dynamic agriculture infrastructures, encouraging the use of latest techniques, credit linkages and incentive in each region to accomplish local self-sufficiency by home grown food production. Establishment of required infrastructures will also motivate private investment in agriculture on practicable basis to generate huge employment and lessen the prevalence of food poverty and increase the sustainability and the wellbeing of the masses

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Conflict of Interest

Authors declared no conflict of interest.

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