

# Socio-Economic Characteristics of Farming Community and Food Security Situation in Punjab, Pakistan

Bushra Pervaiz<sup>1</sup>, Ningui Li<sup>1</sup>, Muhammad Qasim Manzoor<sup>1</sup> & Muhammad Yaseen<sup>2</sup>

<sup>1</sup> Institute of Agricultural Economics and Development, Chinese Academy of Agricultural Sciences, Beijing, China

<sup>2</sup> Department of Agricultural Extension and Rural Development, University of Sargodha, Pakistan

Correspondence: Ninghui Li, Institute of Agricultural Economics and Development, Chinese Academy of Agricultural Sciences, 12 Zhongguancun Nandajie, Haidian District, Beijing China. Tel: 86-136-8114-3251. E-mail: lininghui@caas.cn

Received: May 5, 2017

Accepted: June 21, 2017

Online Published: July 15, 2017

doi:10.5539/jas.v9n8p130

URL: <https://doi.org/10.5539/jas.v9n8p130>

## Abstract

Despite the availability of ample food and reasonably low food prices, food insecurity prevailed in many developing countries in 1970s. The paradigm shift in 1980s from supply to demand side of food security underlined the entitlement or access to food as the center of mainstream research. Current study is the findings of the data collected from household level survey regarding socio-economic and food insecurity conditions in the Punjab province of Pakistan. The descriptive analysis and cross tabulation of the household data revealed that household assets, house building material, size of agricultural farms, ownership of tractor, farm livestock were associated with food security conditions of the farming community. The data results also confirmed that the poorer families made major expenditure on the food out of total household expenditure every month. It was also revealed that households in the irrigated regions of Punjab have better entitlement as compared with households surveyed from Thal (desert) and rain-fed regions. The daily consumption of eggs, milk and various forms of meat was found below daily recommended nutritional requirements in most of the households. This study confirms the findings of the earlier surveys made in this regard and highlights the demand side of food insecurity issues in Punjab province of Pakistan. Food security policies in Pakistan should focus entitlement and food access of farming households. The household and farm assets need to be built for reducing vulnerability of poorer farming community to food insecurity in Pakistan.

**Keywords:** food insecurity, household assets, farm endowments, nutritional intake, food shortages, Punjab, Pakistan

## 1. Introduction

The understanding of the nature and causes of food insecurity has changed considerably over a period of last three decades. Traditionally, it was availability aspect of food that gained focus especially after World Food Crisis of 1972-74 when it was assumed that any decline in the aggregate food supply coupled with food price inflation caused food insecurity at local, regional or global level. Conversely, it was observed later on that despite availability of sufficient amount of food and prevalence of reasonably low food prices, many developing countries suffered from severe conditions of food insecurity. Following Amartya Sen's (1981) seminal work which brought about a paradigm shift, the demand side of the food insecurity affecting the access to food was focused rather earlier considerations for level and reliability of food availability only. This resulted in increased emphasis on the access, vulnerability and entitlement of food and unit of analysis also changed from the global, regional and local level to household and individual level. In view of these developments in the existing literature, the FAO (1996) provided the most comprehensive definition of food security which stated, "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life".

Food security has been conceived as a function of "entitlements" which means that famine can occur despite any change in food availability if the value of people's production and work activities declines relative to the cost of staple food. "Entitlements" or access to food may include investments, household stores and social claims which determine individual's vulnerability to famine (Swift, 1989). The conditions of food insecurity may occur due to

decline in entitlements because successive spells of crisis may easily deplete the little buffer capacity available with the poorer households which already tend to possess meagre household assets. This implies that food security should be studied in term of declining entitlements to different socio-economic groups of the society.

Pakistan has four provinces *i.e.* Punjab, Sindh, Khyber-Pakhtunkhwa (KPK) and Baluchistan but for the sake of current study only Punjab has been focused. Punjab is the most important province as it contains 52% of total population, 57% of total cultivated area and 69% of total cropped area of the country. The Punjab province contributes a major share in agricultural economy of the country because nearly 97% of rice, 83% of cotton, 80% of wheat, 63% of sugarcane, 66% of mango and 95% of citrus is grown in this province and surplus production is both supplied to rest of country and exported to other countries (GOP, 2015).

This paper investigates the relative importance of supply (food availability) and demand (food access) variables of food security at the household level. The focus of the study is to explore the link between farming characteristics, household assets and food security in rural households in Pakistan. It is hypothesized that some household and farm characteristics such as level of living, farm productivity, disaster vulnerability, farm mechanization, assets of livestock, land use and food intake are important in determining whether the households are food secure or not.

The current paper is divided into five parts: the introduction has been presented in the part one; part two underlines the food insecurity situation in Pakistan; part three gives details on the research design and data; part four is the results and discussion whereas the conclusion is presented in the last part five.

## 2. Food Insecurity in Pakistan

Pakistan is world's 6<sup>th</sup> most populous country with an estimated population of 195.4 million which is increasing with a growth rate of 1.89. It is estimated that Pakistan's total population will be doubled by 2045 if the same population growth rate is maintained. Agriculture is a major sector which contributes 19.8% to GDP and employs 43.3% labor force in the country. Within agriculture sector, 58.6% value addition is made by livestock subsector whereas the contribution of crop subsector stands at 37.2% (GOP, 2016).

There have been significant efforts towards food self-sufficiency in Pakistan. No doubt, the agriculture production in every aspect has increased many times in Pakistan however, per capita food grain availability is still at 154 Kg per capita per year and it is wheat that constitutes more than two third of total grains produced in the country (Ahmad & Farooq, 2010). Despite all the efforts, Pakistan still has an alarming level of food insecurity. According to National Nutritional Survey of Pakistan held in 2011, at least 58% of households were food insecure in Pakistan and each household incurred 50.8% of monthly income on food only. Similarly, 15% of children under 5 suffered from acute malnutrition and 44% of the same age were recorded stunted whereas 32% were underweight (NNS, 2011). It is estimated that nearly 41.4 million (22%) people in Pakistan are undernourished (FAO, 2015).

Being a developing country, food insecurity is increasingly attributed to poverty and food affordability in Pakistan. Food poverty underlines the access to food in the food insecurity issue. The incidence of food poverty is more severe in rural areas as compared with urban areas. Pakistan ranks 147 on Human Development Index (HDI) out of 187 countries indicating that it is better than only Afghanistan in South Asia. Unfortunately, Pakistan has missed most of the Millennium Development Goals (MDGs) targets related to child nutrition and health especially weigh-for-age, height-for-age and weight-for-height. Despite all the access and utilization of food security issues at household level, Pakistan grows food grains more than its need and is net exporter of agricultural produce. It has aligned its policies for attainment of targets of food security under Sustainable Development Goals (SDGs).

## 3. Literature Review

The association of level of living, household assets and farm endowments are well documented in the literature regarding demand side of food security. For example, it was confirmed by Bocquier et al. (2015) that socio-economic characteristics, living conditions and dietary quality were associated with food insecurity conditions prevailed in France. They found that financial and geographical accessibility of food should be incorporated in the national nutritional policies. The impact of socio-economic characteristics on food security conditions was explored by Chi et al. (2014). By analyzing National Health and Nutrition Examination Survey 2007-08, they showed that most of the US household were food secure and only 8% had very low food insecurity. Aidoo, Mensah, and Tuffour (2013) executed description statistics and logistic regression on the survey data from Ghana and showed that household size, farm area, off-farm income and access to farm credit significantly

influenced household food security. They confirmed the priori information that larger households were found to be better food secure.

The significance of household wealth, education and occupation in context of food security was confirmed by Sraboni et al. (2014) in a national representative survey. They concluded that women empowerment was associated with better intake of calories and dietary diversity. Through a survey conducted among university students, Gaines et al. (2014) proved the importance of financial status, resources and skill development, and described them as food resource adequacy. Similar results were found in Nigeria by Titus and Adetokunbo (2007). They showed that food insecurity was higher in female headed households and aged household heads but it decreased with the increase in the level of education.

Maharjan and Khatri-Chhetri (2006) employed head count method and squared food insecurity gap to assess the relationship between socio-economic characteristics and food security in rural areas of Nepal. They confirmed that majority of the household in the region were food insecure and extent of food security varies greatly according to socio-economic status of the respondents. They described that resources were disproportionately distributed in favor of higher castes those were relatively more food secure. Further, they concluded that small family, lower dependency ratio, more irrigated land and livestock holding was positively associated with food security.

#### **4. Methodology and Data**

The purpose of this research is to investigate the entitlement aspect of food security at household level. For this purpose, a comprehensive and structured questionnaire was developed. It was consisted of separate modules for household economic level, agricultural farm productivity, farm machinery, livestock information, land use and food security situation. At first, the pre-testing of the questionnaire was undergone in the field to check the response rate, possible ambiguity or difficult interpretation on the questions for the respondents. Subsequently, necessary amendments and improvements were incorporated in the questionnaire in the light of pre-testing. Finally, a sample size of 300 questionnaires was used and data across Punjab province was collected from individual households by employing multi-stage cluster sampling technique. Data collection involved response from 4 regions, 11 zones, 18 districts and 28 sub-districts and 84 different villages of the Punjab. All the data entry and data documentation was made by using EpiData version 3.1 and subsequently the descriptive analysis was done by using IBM SPSS Statistics version 23.

#### **5. Results and Discussions**

The patterns of crops in Punjab depend upon soil categories and climatic conditions for agricultural crop production. On the basis of climate and soils, the agricultural land in Pakistan has been divided into twelve agro-ecological zones which in turn are grouped across four regions *i.e.* irrigated plains, arid region, Thal region and marginal land. The irrigated plains includes cotton zone, mixed zone and rice zone; arid region includes high rainfall and low rainfall areas; Thal region has both irrigated and desert like conditions; whereas marginal region includes Rode Khoi (hill torrent) zone, Suleiman mounts and Cholistan. The descriptive analysis of the survey data is tabulated as below:

Table 1. Average house area and house building material type

Name of district	Average house area (Marlas)		House building material type (%)		
	Average Area	Std. Dev.	Mud	Mud and Bricks	Cement and bricks
Layyah	20.0	12.693	0	50	50
Chiniot	14.7	8.5611	0	40	60
T.T. Singh	12.7	5.6205	0	35	65
Bhakkar	12.0	5.0144	53	40	7
Bahawalpur	11.0	5.1759	36	36	28
D.G. Khan	10.6	4.3205	52	36	12
Sialkot	10.6	4.0714	0	30	70
Chakwal	10.1	5.5296	20	55	25
Vehari	10.0	4.5704	10	50	40
Gujranwala	9.4	3.4383	0	50	50
Gujrat	9.4	5.1034	10	60	30
Rajanpur	9.3	4.5743	47	53	0
Rawalpindi	9.3	4.296	0	70	30
Bahawalnagar	9.2	5.6135	0	60	40
Attock	8.1	3.4785	0	60	40
R.Y. Khan	8.0	3.376	26	43	31
Jhelum	7.3	2.7305	0	50	50
Faisalabad	5.8	1.6541	0	50	50
Punjab	10.9	4.9901	14.1	48.2	37.7

It can be seen in the above Table 1 that there is huge variation in the average house area among different districts of the Punjab province. Faisalabad, Jhelum and R.Y. Khan have the smallest houses with average area of 7.0 Marlas (a local unit of area equal to 272.251 sq. ft.) whereas the Layyah, Chiniot and T.T. Singh have larger sized houses with an average area of 15.8 Marlas. It can also be observed that as the average house area decreases the standard deviation also decreases indicating that the presence of smaller sized houses in districts which are showing large average area *e.g.* Layyah, Chiniot and T.T. Singh etc. Similarly, the data shows that average house area a 10.9 Marlas for all districts.

By analyzing the building material of houses, it is evident that both larger sized and smaller sized houses are usually made of cement and bricks as compared with medium sized house which are normally made of mud and mud & bricks as well. It can also be seen that most of the mud houses have an average area between 9-12 Marlas as compared with mud & bricks houses which are almost equally disbursed among all sizes of houses.

Table 2. Household assets endowment

District	Household assets endowment						Cumulative Score
	Kitchen	Toilet	Electricity	TV	Motorcycle	Mobile	
Layyah	5	9	10	8	7	10	49
Bahawalnagar	3	6	10	7	8	9	43
Gujranwala	2	9	10	9	4	9	43
Sialkot	5	7	10	8	6	8	41
T.T. Singh	0	9	10	9	6	9	41
Faisalabad	3	6	10	8	5	8	40
Chiniot	1	10	10	8	5	6	38
Jhelum	3	7	10	5	7	5	37
R.Y. Khan	2	8	10	7	5	5	37
Attock	2	8	10	6	1	7	34
Chakwal	2	8	9	4	3	8	33
Vehari	2	7	10	4	5	4	32
Bhakkar	1	9	10	5	2	5	31
Gujrat	0	7	10	2	6	4	29
Rawalpindi	0	6	10	4	5	4	29
Bahawalpur	0	5	9	3	4	6	27
Rajanpur	2	3	9	3	4	6	27
D.G. Khan	0	5	9	4	2	2	22
<b>All District</b>	<b>17.8</b>	<b>70.1</b>	<b>97.5</b>	<b>56.4</b>	<b>46.0</b>	<b>63.6</b>	-

The above Table 2 presents the various household assets as a proxy for household level of endowments and level conditions. It is evident that on an average only 17.8% of all households in Punjab have kitchen because most of the households have open air cooking area without proper walls and roof. Similarly, it was observed that only 70.1% of all households surveyed had toilet within the house however, others defecated in the open. Electricity was present in almost all the households. It was observed if some of the households did not have direct electricity connection, they had managed it by sharing electricity connection with the neighbors. On an average, nearly half of the households possessed a TV and motorcycle. But, interestingly, mobile phone was present in 63.6% of the households.

If each of the six household assets mentioned in the above Table 2 are given equal weightage then households in Layyah, Bahawalnagar and Gujranwala were most endowed whereas households in D.G. Khan, Rajanpur and Rawalpindi appeared to be least endowed.

Table 3. Mean monthly expense on food and other heads

District	Mean household monthly expenditure (Per cent of total expenditure)				
	Food	Education	Health	Utility bills	Others
Faisalabad	41.4	10.2	6.9	8.9	32.6
Bahawalnagar	47.1	4.0	7.0	8.4	33.5
Attock	47.3	16.0	6.4	5.3	24.9
R. Y. Khan	51.3	5.3	4.6	8.2	30.6
Gujranwala	54.0	7.6	6.2	10.5	21.7
Layyah	57.2	6.0	5.0	7.7	24.1
Jhelum	62.0	8.1	7.4	7.4	15.1
Gujrat	62.5	2.9	7.4	9.8	17.4
Rajanpur	62.9	3.6	7.0	8.0	18.5
Chakwal	63.2	7.2	4.2	10.1	15.3
Vehari	64.1	4.8	4.6	10.0	16.6
Chiniot	64.4	6.5	4.4	7.3	17.5
Bhakkar	64.7	5.9	5.7	7.7	16.0
D.G. Khan	65.4	4.8	4.7	9.1	16.0
Rawalpindi	68.9	5.9	4.9	7.9	12.5
Bahawalpur	69.4	6.2	4.4	7.5	12.6
Sialkot	70.6	5.3	3.9	7.9	12.2
T.T. Singh	72.9	2.4	3.5	8.5	12.6
<b>All Districts</b>	<b>57.7</b>	<b>5.8</b>	<b>4.8</b>	<b>7.7</b>	<b>23.9</b>

The above Table 3 describes the percentage of total household expenditure incurred on food, education, health and utilities etc. According to current survey results, for all districts on an average, 57.7% of the total household expenditure was made on food only and least share of total expense was made on health and education in a month. Utility bills which primarily include electricity bills and communication charges on mobile calls consumed on an average 7.7% of the total household expenditure for all districts. If share of total expenditure spent on food items is taken as proxy for standard of living then, as per above results, T.T. Singh, Sialkot, Bahawalpur and Rawalpindi are among the most poor districts on one extreme and Faisalabad, Bahawalnagar, Attock and R.Y. Khan are comparatively most rich districts. It can also be seen that as the share of expenditure on food items out of total household expenditure increases the corresponding share on education and health tend to decrease. However, the expenditure on utility bills remains least affected with the change in expense on food items which shows inelastic demand for expenditure on utility bills. The demand for other goods, on the other hand, has roughly an inverse relationship with the expense on food items.

Table 4. Farm size and mode of irrigation

District	Mean farm area (Acres)		Mode of irrigation (%)		
	Farm Area	Std. Dev.	Irrigated	Rain-Fed	Both
Layyah	17.3	13.6304	87.9	40.5	28.3
Bhakkar	10.6	8.9536	43.9	121.9	65.8
Gujrat	10.3	5.2885	33.9	86.4	20.3
D.G. Khan	9.9	5.6611	92.2	105.9	98.2
Rajanpur	8.2	5.0351	54.3	85.8	40.0
Chakwal	7.9	2.9828	0.0	100.0	0.0
Chiniot	7.7	3.7783	100.0	0.0	0.0
Vehari	7.7	6.6209	87.6	101.5	89.2
Bahawalpur	7.5	4.9828	100.0	0.0	0.0
Sialkot	7.4	4.7219	100.0	0.0	0.0
T.T. Singh	7.2	5.3521	100.0	0.0	0.0
R.Y. Khan	6.5	4.2287	100.4	0.0	0.4
Faisalabad	5.8	4.5228	100.0	0.0	0.0
Bahawalnagar	5.1	2.9515	100.0	0.0	0.0
Gujranwala	3.8	1.0055	100.0	0.0	0.0
Attock	3.2	1.9465	53.1	88.5	41.7
Rawalpindi	1.6	0.7691	79.0	95.4	74.4
Jhelum	1.4	0.8929	74.9	94.2	69.1
<b>Total</b>	<b>7.2</b>	<b>4.6291</b>	<b>78.2</b>	<b>51.1</b>	<b>29.3</b>

The survey results of Table 4 show that the mean farm area size is 7.2 acres for all the districts. Larger sized farms are found in Layyah, Bhakkar and Gujrat whereas Jhelum, Rawalpindi and Attock have smaller sized agricultural farms. Layyah and Bhakkar belong to Thal regions where agricultural land is sandy in nature and primarily rain-fed. Due to non-availability of canal and tube-well irrigated water, the agricultural productivity is also very less and large farms are very common. On the other hand, the farm size on canal and tube-well irrigated areas *e.g.* Faisalabad, Bahawalpur and Vehari is on an average smaller due to costly and highly productive land. The value of standard deviation shows the existence of variability among farm size. The farm sizes in Layyah and Bhakkar are highly variable as compared with those of Jhelum and Rawalpindi. The size of farm is highly important in agricultural farming because it is indicative of total production and returns. However, the level of fertility and mode of irrigation facility are the most important factors which determine the overall returns from the agricultural farm.

It is observed that nearly 78% of total land surveyed was irrigated whereas nearly 51% was rain-fed. The results showed that more than a quarter of total land had both sources of irrigation water *i.e.* canal or tube-well and rain. Irrigated areas are concentrated in rice producing areas of Gujrat, Sialkot and Gujranwala; cotton producing areas of Bahawalpur, R.Y. Khan and Vehari; and mixed cropping areas of Chiniot, Faisalabad and T.T. Singh. Similarly, rain-fed areas fall into arid zone *e.g.* Chakwal, Rawalpindi and Jhelum, and Thal region *e.g.* Bhakkar and Layyah.

Table 5. Ownership of tractor for farm operations or otherwise

District	Ownership of tractor for farm operations (%)		
	Owned	Shared	Ranted
Sialkot	45.0	35.0	20.0
Chiniot	40.0	5.0	55.0
Layyah	40.0	30.0	20.0
Attock	30.0	10.0	10.0
Bahawalnagar	30.0	30.0	40.0
Faisalabad	30.0	30.0	30.0
Gujrat	30.0	20.0	0.0
T.T. Singh	25.0	15.0	30.0
Gujranwala	20.0	40.0	40.0
Vehari	20.0	40.0	40.0
D.G. Khan	16.0	12.0	4.0
R. Y. Khan	14.3	17.1	20.0
Rajanpur	13.3	6.7	20.0
Jhelum	10.0	20.0	0.0
Rawalpindi	10.0	20.0	0.0
Chakwal	5.0	20.0	0.0
Bahawalpur	4.0	12.0	4.0
Bhakkar	0.0	16.7	30.0
<b>All Districts</b>	<b>21.3</b>	<b>21.1</b>	<b>20.2</b>

The Table 5 shows that data results for tractor ownerships by farming households. It is evident that mostly tractors are owned by farmers in Sialkot, Chiniot and Layyah. Whereas, farmers in Gujranwala and Vehari shared tractor for various farm operations. The farmers in Chiniot and Bahawalnagar tend to rent in tractor for farm operations. Tractor is an important farm asset in the context of agriculture conditions in Punjab and can be taken as proxy for farm mechanization. But, on an average only 21% of total households for all districts owned tractors whereas the similar proportion of households shared and rented in tractor. The data showed that there were certain farmers who neither owned a tractor, nor shared tractor with others and did not rent in it from others. This may be due to non-suitability of tractor for agricultural farming especially in arid and Thal areas, and use of bullocks driven plough etc.

Table 6. Occurrence of disaster or major crop/house damage during last five years

District	Occurrence of disaster or major crop/house damage (%)	
	Yes	No
Rajanpur	100.0	0.0
D.G. Khan	92.0	8.0
R.Y. Khan	82.9	17.1
Layyah	80.0	20.0
Bhakkar	63.3	36.7
Bahawalnagar	60.0	40.0
Gujrat	60.0	40.0
Chakwal	55.0	45.0
T.T. Singh	55.0	45.0
Bahawalpur	48.0	52.0
Attock	20.0	80.0
Faisalabad	20.0	80.0
Rawalpindi	10.0	90.0
Sialkot	10.0	90.0
Vehari	10.0	90.0
Chiniot	0.0	100.0
Gujranwala	0.0	100.0
Jhelum	0.0	100.0
<b>All Districts</b>	<b>42.6</b>	<b>57.4</b>

The above Table 6 depicts the occurrence of any natural disaster during last five years. These disasters include flood, drought, land slide, earthquake, extreme weather, unusual pest attack and major crop failures. Rajanpur, D.G. Khan, R.Y. Khan and Layyah are most disaster prone districts in Punjab. Similarly Jhelum, Gujranwala, Chiniot and Vehari are least suffered from disaster during last five years. These natural disasters incurred heavy losses of farm production and farming community's houses. They not only affected their houses but also incurred losses to livestock present on farm or house.

Table 7. Livestock ownership per household

District	Livestock ownership per household (No.)			Livestock score
	Cows	Buffalos	Sheep/Goat	
T.T. Singh	8	7	1	15.5
Sialkot	9	5	2	15.0
R.Y. Khan	5	7	3	13.5
D.G. Khan	7	5	2	13.0
Bhakkar	7	5	1	12.5
Chakwal	3	8	3	12.5
Chiniot	4	5	6	12.0
Rawalpindi	3	8	1	11.5
Bahawalnagar	3	5	3	9.5
Jhelum	2	5	0	7.0
Faisalabad	2	4	1	6.5
Vehari	2	4	1	6.5
Bahawalpur	2	3	1	5.5
Gujrat	2	2	2	5.0
Attock	3	1	1	4.5
Rajanpur	3	1	0	4.0
Gujranwala	1	0	1	1.5
Layyah	1	0	1	1.5
<b>All Districts</b>	<b>3.7</b>	<b>4.2</b>	<b>1.7</b>	<b>8.7</b>

Looking at the livestock population present on the agricultural farms, it is shown in the above Table 7 that buffalos are most usual animal among all the livestock. On an average, there are 4.2 buffalos, 3.7 cows and only 1.7 sheep/goats present on the agricultural farms. Cows are most prevalent in T.T. Singh, Sialkot and R.Y. Khan whereas farmers in Chakwal and Rawalpindi have relatively more buffalos on their farms. The sheep/goats are most frequently found in Chiniot, Chakwal and R.Y. Khan. The overall livestock score can be calculated by equating one cow or buffalo with two sheep or goats. In this way, T.T. Singh, Sialkot, R.Y. Khan and D.G. Khan have more livestock population as compared with Layyah, Gujranwala, Rajanpur and Attock where only few livestock population is present on the farms. Farm livestock is very important farm asset for the farmers. These can easily be cashed if needed during the periods of stress or disaster. Primarily, livestock is kept by the farmers for milk however they are a good source of meat as well.

Table 8. Consumption of eggs, milk and meat per household

District:	Daily milk consumption (L)	Daily egg consumption (No.)	Daily meat consumption (g)				
			Total	Mutton	Beef	Poultry	Fish
Layyah	3.7	3.6	213	50	50	70	43
Bahawalnagar	2.5	2.4	174	33	40	67	33
Sialkot	3.5	3.1	158	31	31	57	39
D.G. Khan	3.3	2.4	152	31	28	56	38
Chiniot	4.3	3.1	151	28	33	63	28
Gujrat	1.8	3.0	149	33	25	62	29
Attock	1.9	1.7	145	0	42	70	33
Vehari	1.3	2.3	144	28	33	53	29
Bhakkar	3.4	2.3	143	30	27	48	38
Total	2.7	2.7	139	24	32	54	29
Faisalabad	2.6	2.0	133	33	50	50	0
T.T. Singh	2.8	3.1	130	17	33	55	25
Chakwal	2.6	2.7	129	25	19	52	33
R.Y. Khan	2.1	2.9	127	24	31	46	26
Bahawalpur	2.1	3.1	120	33	18	47	22
Gujranwala	3.0	3.2	113	0	40	56	17
Rajanpur	2.3	2.5	97	26	22	32	17
Jhelum	2.6	1.4	86	17	28	42	0
Rawalpindi	2.3	1.8	83	0	23	43	17
<b>All District</b>	<b>2.6</b>	<b>2.6</b>	<b>136.1</b>	<b>24.3</b>	<b>31.9</b>	<b>53.7</b>	<b>26.1</b>

Table 8 indicates the mean consumption of milk, eggs and meat on daily basis by each household in various districts in Punjab. It is evident that on an average, 2.6 liter of milk, 2.6 eggs and 136.1 grams of total meat is consumed by the whole household on daily basis. If average household size in Punjab is taken as 6.04 (HIES, 2016), then the consumption of this much nutrition is much below the average recommended daily nutrition derived from milk, eggs and meat. Among various categories of meat, poultry is mostly consumed meat followed by beef and fish, however, the consumption of mutton is least as compared with all others.

Meat consumption is relatively highest in Layyah, Bahawalnagar and Sialkot whereas it is consumed the least by the households in Rawalpindi, Jhelum and Rajanpur. Almost a similar trend is observed in the consumption of milk and eggs.

Table 9. Experience of food shortage during last one year

District	Experience of food shortage during last one year		If yes, then how long did it prevailed	
	No (%)	Yes (%)	Up till one month (%)	Beyond one month (%)
Rajanpur	13.3	86.7	35.0	66.7
Layyah	30.0	70.0	46.2	57.1
Rawalpindi	30.0	70.0	36.4	62.5
Chakwal	35.0	65.0	38.1	67.9
Bhakkar	36.7	63.3	32.1	61.9
Bahawalpur	40.0	60.0	37.5	55.6
D.G. Khan	40.0	60.0	31.8	68.2
Faisalabad	40.0	60.0	40.0	60.0
Gujranwala	40.0	60.0	40.0	60.0
Chiniot	50.0	50.0	44.4	83.3
Gujrat	50.0	50.0	16.7	71.4
Jhelum	50.0	50.0	28.6	53.8
T.T. Singh	50.0	50.0	44.4	65.2
Vehari	50.0	50.0	37.5	65.0
R.Y. Khan	57.1	42.9	34.8	63.6
Attock	60.0	40.0	33.3	50.0
Bahawalnagar	60.0	40.0	42.9	55.6
Sialkot	70.0	30.0	50.0	62.5
<b>All Districts</b>	<b>44.6</b>	<b>55.4</b>	<b>37.2</b>	<b>62.8</b>

The farming households was asked if they ever experienced severe shortage of food due to various reasons *e.g.* low crop yield, disaster, disease of the household head etc. It was revealed that these experiences were quite common among the farming community. The Table 9 indicates that on an average 55.4% of the households experienced food shortage during last one year and only 44.6% households evaluated that they did not have to pass through a period of severe food shortage. The households in the Rajanpur, Layyah, Rawalpindi and Chakwal experiences food shortage most severely. In Rajanpur nearly 87% household had to face food shortage as compared with 30% of total households in Sialkot.

Similarly, the duration of the spell of food shortage was also assessed. It was observed that 50% and 44.4% households in Sialkot and T.T. Singh respectively undergone through shortage of severe food for a period extending from one week to four weeks. However, longer period of shortage was more prevalent and was experienced by usually households living in Chiniot, Gujrat and Chakwal. On an average, 37.2% of total household experienced short term food shortage extending up till one month where 62.8% households experienced such food shortage for more than one month.

## 6. Conclusion

The current study gives an estimation of the socio-economic characteristics of the farming community and extent of food security in Punjab province of Pakistan. From the detailed data summaries and discussions in the previous section, it can be concluded that overall entitlement and resource endowment is important for the farming community to be food secure. The entitlement hypothesis was fully supported with the results related to household assets, farm size and farm mechanization. It was observed that the households who have better score for household assets, have larger sized agricultural farms and own a tractor are able to draw more profit from the agricultural farming and live a life with relatively better standard. The house area was not found directly related to conditions linked with food security. But with a deeper look into the housing material gave the necessary justification. It can be concluded as both smaller and larger houses tend to be made of cement and bricks, the medium sized houses are usually build with either mud or mud and bricks.

It is concluded that the overall nutritional consumption of farming community is very meagre as compared with the minimum daily recommended nutritional requirements. Moreover, it is observed that a large proportion of total households suffered from severe shortage of food items. Such spell of food shortage was not only frequent but lasted even more than one month. It can be drawn that nearly half of the population may be severely food insecure. The same was supported from analysis of the results from the expenditure on food items out of total

household expenditure. The households which have to spend proportionately sufficient amount of money for food items out of total monthly expenditure were not food insecure. Similarly, they were not able to relatively invest more in the education and health of family members. The results from the ownership of livestock indicate that the livestock is not only a source of milk and meat but provides a buffer against vulnerability to food insecurity. The households who possess livestock are proportionately better positioned to be food secure with improved nutrition.

The effects of natural disasters were very severe and long lasting. Natural disaster significantly eroded the food self-sufficiency and resilience of the farming community. Due to heavy loss of standing crops and sometimes damage to house infrastructure from natural disaster easily caused the households to be categorized as food insecure. Overall, the findings of the current survey confirmed the early reporting of poor conditions of food insecurity and its linkage with socio-economic characteristics in context of Pakistan. Even though, the statistics show that Pakistan is net exporter of agricultural products and has attained relatively better self-food sufficiency, still there are nearly half of the farming households in the rural areas which are food insecure. These food insecure households have least entitlements or access to food and they have poor living conditions, meagre household assets and small farm size. They are not able to spend much on education and health because most of the money is spent on food expenditure every month. Government should align its food security policies in such a way that access to food gained center position for improving nutrition level. Moreover, the vulnerability of rural households' decreased by poverty reduction and building households and farms assets.

## References

- Ahmad, M., & Farooq, U. (2010). *The state of food security in Pakistan: Future challenges and coping strategies*. A paper presented at the 26th Annual General Meeting and Conference of Pakistan Society of Development Economists, Islamabad.
- Aidoo, R., Mensah, J. O., & Tuffour, T. (2013). Determinants of household food security in the Sekyere-Afram plains district of Ghana. *European Scientific Journal*, 9(21).
- Bocquier, A., Vieux, F., Lioret, S., Dubuisson, C., Caillavet, F., & Darmon, N. (2015). Socio-economic characteristics, living conditions and diet quality are associated with food insecurity in France. *Public Health Nutrition*, 18(16), 2952-2961. <https://doi.org/10.1017/S1368980014002912>
- Chi, D. L., Masterson, E. E., Carle, A. C., Mancl, L. A., & Coldwell, S. E. (2014). Socioeconomic status, food security, and dental caries in US children: Mediation analyses of data from the National Health and Nutrition Examination Survey, 2007-2008. *American Journal of Public Health*, 104(5), 860-864. <https://doi.org/10.2105/AJPH.2013.301699>
- FAO. (1996). *Rome Declaration on Food Security and World Food Summit Plan of Action*. Food and Agriculture Organization (FAO), Rome. Retrieved December 2, 2016, from <http://www.fao.org/docrep/003/w3613e/w3613e00.htm>
- FAO. (2015). *State of Food Insecurity in the World 2015*. Food and Agriculture Organization (FAO), Rome. Retrieved March 2, 2017, from <http://www.fao.org/hunger/en>
- Gaines, A., Robb, C. A., Knol, L. L., & Sickler, S. (2014). Examining the role of financial factors, resources and skills in predicting food security status among college students. *International Journal of Consumer Studies*, 38(4), 374-384. <https://doi.org/10.1111/ijcs.12110>
- GOP. (2016). *Economic Survey of Pakistan 2015-16*, Ministry of Finance, Government of Pakistan, Islamabad. Retrieved November 10, 2016, from [http://www.finance.gov.pk/survey\\_1516.html](http://www.finance.gov.pk/survey_1516.html)
- HIES. (2016). *Household Integrated Economic Survey 205-16*, Table 01: Average household size and its composition by sex and quintiles, Pakistan Bureau of Statistics, Government of Pakistan, Islamabad. Retrieved February 8, 2017, from <http://www.pbs.gov.pk/content/household-integrated-economic-survey-hies-2015-16>
- Maharjan, K. L., & Khatri-Chhetri, A. (2006). Household food security in rural areas of Nepal: Relationship between socio-economic characteristics and food security status. *2006 Annual Meeting, August 12-18, 2006, Queensland, Australia (No. 25624)*. International Association of Agricultural Economists.
- NNS. (2011). *National Nutrition Survey of Pakistan*. Research and Development Solutions, Islamabad. Retrieved April 2, 2017, from [http://www.resdev.org/files/policy\\_brief/41/PolicyBrief41-NutritionalStatus.pdf](http://www.resdev.org/files/policy_brief/41/PolicyBrief41-NutritionalStatus.pdf)

- Sraboni, E., Malapit, H. J., Quisumbing, A. R., & Ahmed, A. U. (2014). Women's empowerment in agriculture: What role for food security in Bangladesh? *World Development*, *61*, 11-52. <https://doi.org/10.1016/j.worlddev.2014.03.025>
- Swift, J. (1989). Why are rural people vulnerable to famine? *Institute of Development Studies (IDS) Bulletin*, *20*(2), 8-15. <https://doi.org/10.1111/j.1759-5436.1989.mp20002002.x>
- Titus, B., & Adetokunbo, G. (2007). An analysis of food security situation among Nigerian urban households: evidence from Lagos State, Nigeria. *Journal of Central European Agriculture*, *8*(3), 397-406.

### Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).