Original Article

Household size and living standard: Evidence from Khyber District of Ex-FATA

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Abstract

The objective of this study is to understand the living standard of households and to assess the net impact of household size in the Federally Administered Tribal Areas (ex-FATA). For reaching these objectives, this study uses primary data collected through an interview schedule. First, descriptive statistics are used for comparing the living standard of the households from the study area with province and country. Second, the "consumption quintiles" method is used for assessing the net impact of household size on the living standard. For this analysis, the OECD equivalence scale is used which adjusts the household size for incorporating the economies of large household size. The results of the study show that 71% of people live below the poverty line and per capita income is 490 USD in the study area. Households allocate 58% of expenditure to food consumption. All these results indicate a very low level of living standard in the study area. Finally, the study finds out the net impact of large household size on living standard to be negative. In the end, the study recommends certain policies for improving living standards and controlling population growth.

Keywords: Living standard, poverty, household size, Ex-FATA, consumption function, PCI

Introduction

Improving living standards is one of the main goals of policymakers around the world, yet world data show a major portion of the population is stuck in a very vulnerable condition (UNDP, 2019). The situation is even worse in developing countries like Pakistan. As the population is rising in developing countries, people find it almost impossible to break the shackles of low levels of living. The lower living standard is reflected by reduced consumption, education, health, living space, household facilities, etc. Due to low incomes, the basic life necessities like food, health, and education are not availed as needed and, therefore overall lives are badly affected. Extensive

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literature is available on the factors responsible for it and the measures needed to improve it. This study takes consumption as a proxy for living standards; higher the per capita consumption, better will be the living standard of the households. The analysis of the consumption pattern explains the impact of income and other factors on consumption and living standard. It also tells us about the relative importance of different goods consumed by households. Therefore, the study of the living standard through consumption patterns is one of the fundamental approaches for modern-day researchers. Finally, literature shows that income, education, gender, and household size are all positively affecting consumption while it decreases with age (Ajmair & Akhtar, 2012). This study focuses on understanding the living standard of the households and to estimate the impact of household size in District Khyber, ex-FATA.

Khyber is one of the prominent districts among all the tribal districts due to its vicinity to the provincial capital, Peshawar. The overall living standard in this tribal area is very unattractive. As compared to the HDI score of 0.7 in Pakistan, it is only 0.3 in the study area with 60% people living below the poverty line (Rafi, 2017). Furthermore, including only 12.7% female literate, the overall literacy rate is 33% in this area. There is a high infant mortality rate (80/1000) and maternal mortality rate (04/1000) which reflect the poor health conditions of the masses. Proper toilets, sewerage, and drainage facilities are enjoyed by only 10% of the population while safe drinking water is available to only 42% of the population (UNDP, 2016). To summarize, the study area is as backward as any other unfortunate region in the world (UNDP, 2017).

There are two important objective behind conducting this study in this region: First, the government, so far/till date has not conducted any organized and detailed survey (e.g. HIES or PSLM) for the assessment of the living standards in the target area due to its hardness, scatteredness, and security conditions. Second, in this area, people typically live in joint families with a sufficiently large household size sharing their incomes and consumption. However, to date, no such research has been conducted for assessing the impact of household size on consumption and living standards in the region. Therefore, the purpose of the present work is to investigate the living standard of the households in detail, understand the factors responsible for it, and suggest some solutions, which will be useful for policymakers.

Literature Review

How Should the Living Standard be Defined?

Akekere and Yousuo (2012) define consumption pattern as "the combination of qualities, quantities, acts, and tendencies, characterizing a community or human group's use of resources for survival, comfort, and pleasure." It gives an understanding of how consumers distribute their expenditure between necessities and luxuries and, at the same time, enlightens us about the living standard of households. So one objective of this study is to understand the living standard of the households using consumption patterns.

Factors Affecting the Living Standard of the Households

Consumption of individuals is positively affected by income, gender, education, and family size, whereas age negatively affects it (Ajmair & Akhtar, 2012). Aziz and Malik (2010) found that expenditure on food items increases at a decreasing rate with every increase in income, therefore, all food items are in the group of necessities. Another important indicator of the living standard used by this study is the average propensity to consume (APC). According to Keynes (1937), APC will be lower for the richer than the poorer. There are also other variables like PCI, and the percentage of the population living below the poverty line, which are used by economists for understanding the living standard of the households in a region. Using the mentioned economic variables, this study will test the following hypothesis:

H_1: The living standard of the households in the study area is far lower than the average of the country.

Size of the Household and Living Standard

Families in developing countries have higher fertility rates due to many cultural and economic reasons, however, it has serious consequences on their living standards. Orbeta (2005) found a net negative impact on the welfare of the households with each additional child, and this impact is more severe for poorer families. He also concluded that larger families are more vulnerable to poverty. On the other hand, for Nigeria, an increase in household size results in an increase in expenditure without any significant change in income (OGBE, 2018). But economic literature shows economies of scale in consumption with every increase in household size. This argument is valid for public goods or goods that could be shared without additional expenditure like TV or Fridge, however, this effect is reversed in the case of private goods. Lanjouw and Ravallion (1995) worked on the elasticity of household size regarding expenditure. The study cautions that though large size households enjoy economies in sharing some public goods, there is certain evidence that

per capita expenditure decreases with an increase in household size affecting living standards negatively. It further describes that for Pakistan, the size elasticity of the cost of living is 0.6. This means that to be able to stay on the same level of living standard, the income of the family should increase by 0.6 (not by 1 due to deduction for shared public goods) with every single addition to the family. In light of the above discussion, this study proposes the following hypothesis:

H_2: Household size has a net negative impact on the living standard of the households.

Research Methodology

Descriptive Statistics

First of all, this study uses descriptive statistics for understanding the economic and social conditions of the households in the study area. These statistics are then used for comparison with the province and country.

The Consumption Model

Based on Keynes' (1936) psychological law of consumption, the following Linear Consumption function is estimated:

$$C = \beta_0 + \beta_1 Yi + \beta_2 HS + Ui$$

Where:

'C' represents Consumption of the household

'Y' represents the Income of the household

'HS' represent the Household size

'β_i' represent Coefficients

'U_i' shows Random Error

The Consumption Quintiles Method

For finding relationship between consumption and household size, the "quintiles method" is used. In this method, the households are divided into five groups based on their consumption from least to the most, and the average household size is calculated and written against each quintile. This study uses adjusted household size for emedding the economies of scales into the per capita consumption.

Data Collection

Interview Schedule

A comprehensive interview schedule addressed to the Household representative was evolved. In addition to social and economic features, information on consumption was collected keeping in mind the following four categories:

1. Food Items
2. Non-Food Items
3. Consumer Durables
4. And Housing

Sample and Population

The population of this study was the households in Tehsil Landikotal, district Khyber. A random sample of 250 households was selected through a two-stage sampling technique (Methodology adopted from PSLM Survey) and interviewed. Primary data was collected from the selected households through an interview schedule.

Analytical Technique

The following analytical techniques are used in conducting the study:

1. A multi-stage sampling technique is used. In the first stage, 21 out of 136 stratas were randomely selected from the target area. In second stage, 14 households/stratum were chosen from those stratas using systematic sampling technique (Methodology adopted from PSLM Survey).

2. The Ordinary Least Square technique of Regression is used for finding the relationship between consumption, in, com,e, and household size.

3. SPSS software is used for the analysis of data.

Variables

The study has assessed a variety of variables in its analysis. The main area of concern according to the objectives of the study is an assessment of the living standards of the households. Therefore, data were collected on those variables that are directly related to the study. It includes household income, consumption, food consumption, education, and size of the household.

Analysis of Results

Household Size and its Comparison

One of the objectives of this study is to evaluate the impact of the household size in the sampled area on living standards. Household size has a dual impact on the living standard of the households. On one hand, economies of large household sizes reduce the per capita expenditure while keeping the household members at the same level of living standard. But on the other hand, the earned income is shared by more members, thereby reducing the per capita income of the members. Therefore, the household net welfare increases if the economies of larger households are greater than the decrease in the per capita income, and vice versa. Our analysis in the later part approves the fact that there is a net negative impact of the size of households on the living standard of the household. Table 1 shows a comparison of the household size of the study area with the province and country.

Table 1 Average Household Size Comparison

Year	Khyber	Khyber Pakhtunkhwa	Pakistan
2019	11.5	7.41	6.24

Source: HIES (2018, pp19)

The sample data reveals that the average household size is 11.5 persons in the study area. In contrast, the national and provincial figures for the average household size are 6.31 and 7.34, respectively (HIES 2018). This shows that people prefer to live together in larger households sharing their incomes and consumption. But we will find the impact of such a larger household size on the living standard of the households in the latter part of the study.

Income of the Households

The sample data reveals variations in absolute income across households. The distribution of the income variable is normal. As the data reveals, the average income of the household is 700,696 pkr, with an average household size of 11.5 persons. So per capita income in the study area is 60,930 pkr, which is equivalent to 490 US dollars in February 2019 (124 Rs = 1 USD). In contrast, the per capita income of the whole country is 1,507 US dollars (HIES, 2018). While, based on the analysis of Provincial GDP (Pasha, 2015), KP per capita GDP was 94% of the national figure, which makes it 1,416 US dollars. Based on this analysis, the per capita income in the study area is far below the province and country.

Table 2 Per Capita Income Comparison (US Dollar)

Year	Khyber	Khyber Pakhtunkhwa	Pakistan
2019	490	1,416	1,507

Source: Field survey and World Bank (2018)

Food and Non-Food Expenditure

One aspect of this research is the analysis of how households spend their incomes on necessities and non-necessities. Therefore, data is collected, and analysis is made regarding the consumption of food and non-food items. A higher percentage of expenditure on food items indicates poor living standards and vice versa (Engel, 1857). As the data reveals, consumers spend 58% out of the total expenditure on food items, with a minimum and maximum of 38% and 84% respectively. While food as a percentage of total expenditure in Khyber Pakhtunkhwa and Pakistan is 45% and 37% respectively. This comparison undoubtedly implies a far lower living standard in the study area in comparison with the province and country.

Table 3 Food Consumption as a Percentage of Total Expenditure

Year	Khyber	Khyber Pakhtunkhwa	Pakistan
2019	58%	45%	37%

Source: Field survey and HIES (2015)

Poverty in the study area

Being neglected for decades, the study area is economically underdeveloped in comparison to the country. There is a lack of physical and social infrastructure including roads, electricity, communication, hospitals, and schools. Politically, the area was governed under Frontier Crimes Regulation 1901 (FCR). Thus, the masses don't have the luxury to enjoy the political and economic opportunities that exist in other parts of the country (Factfile IPRI, 2008).

As a result of the above-stated conditions, the living standard is fairly low in the study area (Ex-FATA). Data reveals that, based on the poverty standard of 1.9 US dollar income per day, 71% of the households are living under the poverty line and this is the highest for any region in the country. On the other hand, a very large average household size of 11.5 gives certain economies of large household size to the residents, but even then, the incomes are fairly low

in the region. Alam and Hussain (2013) found the average household size to be 11.07 in 2013 and a poverty level of 51% based on the calorie consumption method, therefore, the current study reveals a further aggravation in the conditions of the masses.

APC in District Khyber is Larger Than Pakistan

Keynes (1937) provided the idea of the average propensity to consume (APC) which shows the proportion of total current income consumed. The theory further suggests that the value of APC is higher for richer than for poorer. This study finds that the value of APC in the target area is 0.96 as compared to 0.86 in Pakistan (HIES, 2018).

The study used many methods for understanding the living standard of the households in the study area. All the above results indicate the fact that the living standard of the households residing in district Khyber is far lower than the average Pakistani household. Therefore, we accept the first hypothesis (H1) which states that the living standard of the households in the study area is far lower than the average of the country.

Regression Model Summary

Regression analysis is used for finding the relationship between the dependent variable and the independent variable(s). Due to the nature of the data, log-log model is used, therefore the coefficients show percentage change in dependent variable due to any change in the independent variable. Goodness of Fit is checked with the help of the R-Square coefficient. Then ANOVA is used to find out the overall significance of the model or the significance of the coefficients together. Finally, the regression coefficients are evaluated for the strength of the relationship between dependent and independent variables.

A significantly high R Square value in Table 4 signifies the impact of independent variables.

Table 4: Goodness of Fit

Model Summary					
	Multiple R	R Square	Adj. R Sq.	Std. Error	Sig
1	0.960	0.921	0.921	1.2892E5	0.00

Table 4 shows the results of model fit, measured by ANOVA (F-test). Since the p-value is less than the level of significance, it is concluded that the fit

between dependent and independent variables is significant, implying a good model.

Table 5: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	4.819E13	2	2.409E13	1.450E3	.000
Residual	4.106E12	247	1.662E10		
Total	5.229E13	249			

The Consumption Function

Table 6: ***The Consumption Function, The impact of HH income and size on HH consumption***

Model	B	SE	t	Sig
Constant	3.135	.191	16.38	0.0000
PC Income	0.73	.016	46.35	0.0000
HH Size	0.160	.020	8.142	0.0000

Table 6. explains the household consumption function in the study area. The impact of income and household size on household consumption is statistically significant with a probability value of 0.000, which shows that both the variables are independently significant predictors of changes in the dependent variable, household consumption, at a 5 percent level of significance. The results of the current study are in parallel with both, the theoretical and empirical literature. The coefficient value of income is 0.73, which shows that a 1% increase in income level leads to an increase of 0.73% in household consumption. Similarly, the impact of household size is statistically significant. The coefficient value of the household size is 0.16, which shows that a 1% increase in household size leads to an increase in household consumption by 0.16%. This analysis brings us to the conclusion that, in addition to the income of the household, household size is a very important variable in determining the consumption expenditure of the household.

Relation Between Household Size and Living Standard

Larger household size is one of the dominant demographic characteristics of the tribal areas and has a significant impact on the share of income each member receives for consumption. By taking per capita consumption as a proxy for living standards, it reduces with every single increase in the household size in the Philippines (Orbeta, 2005). Similarly, HIES (2015) divides the households into quintiles based on their incomes. The data shows the fact that families with smaller household sizes enjoy larger per capita incomes and vice versa. Lanjouw and Ravalion (1995) quote many studies and conclude that there is a negative relationship between household size and per capita income (consumption) and further state that the impact on poverty is severe in developing and underdeveloped countries. Herrin (2002) professes that helping families achieve their desired family size directly increases their living standard, all other things being constant.

There are certain economies of scale in larger household sizes which provide certain advantages to the household members (Lazear & Michael, 1979). First, certain family goods could be used by additional family members without any increase in the cost e.g. electric light, space, lock, etc. Second, scale economies received in purchase in the bulk and the use of certain indivisible goods e.g. tv, internet, cable, etc. Third, specialization in the duties of the household raises efficiencies in the tasks performed and saves time. This shows that the per capita cost of living reduces with an increase in household size, although there will be a certain fixed increase in expenditure due to the need for private goods. To bring them together, per capita income and economies of scale move in opposite directions to one another as a result of any change in HH size.

Though there are economies of the larger household size, this study hypothesizes a net negative impact of household size on the living standard of the members in the target area. To know the exact impact of household size on the living standard, we utilize the adjusted household size method first and then create the quintiles. As the size elasticity in Pakistan is 0.6, (Lanjouw & Ravalion, 1995), this means that to keep the households at the same level of living standard, an additional member needs only 0.6 of expenditure. Therefore, to incorporate this advantage or economies of scale, this study reduces the sizes of all households by a fraction of 0.4 (to keep it at only 0.6) by multiplying it by 0.6, and adjusted household sizes are found. This modification will in effect show a reduced HH size and hence, an increased per capita expenditure and represent a higher living standard for all households to the exact extent of economies of scale. Finally, households from poorest to

richest (based on Per capita expenditure) are divided into five quintiles of equal sizes with their respective household size as follows:

Table 7: Consumption Quintiles and Their Average Household Size

Variable	Quintiles					
	1st (20%)	2nd (20%)	3rd (20%)	4th (20%)	5th (20%)	Overall
Per Capita Consumption PKR	42,760	59,393	74,587	100,155	164,662	**67,320**
Household Size	16.8	10.8	10.6	10.2	8.8	**11.5**

Source: Survey Data

Table 7 summarizes information on quintiles, per capita consumption, and household size. The 1st quintile shows the per capita consumption expenditure and household size of the poorest (worst living standard). Moving along quintiles 2nd to 5th, their household size is decreasing and living standard, represented by PCC, is improving. This reflects the fact that families with smaller household sizes are better off in terms of living standards, and vice versa. Even though the household size is adjusted for the economies of scale, per capita expenditure is lower for larger households and vice versa. In other words, though there is a certain advantage of the larger household to the members living together, still a decrease in per capita expenditure is larger than the received economies of scale. Hence, we accept hypothesis H_2 and conclude that larger household sizes negatively affect the living standard of the household in the study area.

Findings of the Study

The people in the study area, on average are living a poor life than the average of the country and the province. The per capita income, 490 USA dollars is lower than the national and provincial figures. The major portion of the income (58%) of the households is devoted to food consumption. The average propensity to consume in the study area is (0.95) larger than APC for the whole country. All these figures indicate a lower living standard in the region.

Likewise, a larger household size, no doubt provides certain economies to the household members, but its negative impact on per capita consumption is more than the economies of scale. This brings us to the finding

that household size has a net negative impact on the living standard of the households.

Conclusion

This study was designed to assess the living standard of the households in the district Khyber, KP (Ex-FATA), and to investigate the impact of large household sizes on the living standards of the households. The data used in this study is collected through a well-designed interview schedule from randomly selected households of district Khyber. The results show that the living standard is far lower as compared to the national average. Incomes are lower, the percentage of people living below the poverty line is very high, and a very large average size of the household. The study further concludes that the net impact of household size on the living standard of the households is negative.

Being neglected for decades and organized under Frontier Crimes Regulation (FCR), now this area needs special attention to help them live a better life. Before taking any action, a thorough understanding of the situation is necessary which is possible only by extending the country-level PSLM and HIES surveys to this region. To bring short and long-term improvement, sufficient investment would be required in physical and human capital. As this study found out that a large HH size is against the living standard, not only a well-planned population program is needed but also actions are needed for increasing female education and awareness for overall social change. In addition, a provision of technical education will not only create the skills for earning incomes but also the outlook of individuals will change towards life goals and personal achievement.

Though this study covered living standards in detail, still there is space for future work. Ex-FATA is so much neglected by the government as well as academicians in terms of research. Due to its distinct social and economic nature, there is so much gap in conducting academic research in this area. Finally, as we dig deep into this topic, we find a distinct role of large household size in the living standard of the household. Therefore, this study recommends the study of household size from different perspectives.

Finally, there were certain limitations in conducting this study. The first of those was the security problem in the area. Secondly, the area is so abandoned by the governments that even PSLM and HIES surveys don't cover this area. Therefore, too little reliable secondary data is available to properly evaluate the conditions of the area. Thirdly, there are still security threats expected for any survey program. Therefore, this study selected only accessible areas for avoiding any unexpected situations. Also, due to the

nature of research, it was not possible to include more variables in the study. In addition, it was very hard to collect all the relevant information from the respondents, especially economic data, due to their attitude towards surveys.

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