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Abstract

This study analyzes the households' consumption patterns and demand elasticities of Balochistan in both the urban and rural areas. We make use of the Household Integrated Expenditure Survey (HIES) of Pakistan for the year 2005-6. The linear-log models are applied for the analysis of households' consumption patterns. The LA/AIDS model is used in order to estimate the demand elasticities. The study shows that the households' expenditure on food items is increasing at decreasing rate. All the food items are considered as necessity except in the case of vegetable ghee for urban and rural Balochistan. The high expenditure elasticities of several food items e.g. wheat, milk, beef and vegetable ghee call for food support programs, different agriculture policies like subsidies on electricity for water irrigation, pesticides, etc. The major share of total expenditure is devoted to wheat consumption than other food items.

Introduction

Demand theory has been widely applied to determine individual or household consumption behavior. There is hardly any economic theory / research that do not include information of household consumption patterns. Recently, investigators / researchers are in struggle to provide an appropriate answer to some fundamental questions regarding consumer demand analysis, for example, how should a demand function be specified? What are arguments for changing consumer demand pattern? etc. The significance of any household income and expenditure statistics for a country like Pakistan is quite pronounced and well recognized. The need to analyze changes in the standard of living of masses across a country is mostly based on structured and comprehensive surveys like HIES. It provides guideline to policy makers in framing socio-economic developmental policies and in instigating public investments and financial measures to improve economic conditions of the people. The availability of information at different points in time are helpful in evaluating the changes which occur, as a result of economic development, in the consumption pattern, incidence of poverty, trend in the saving propensities and preferences of different groups of population. Balochistan is the least developed province of Pakistan as compared to other three provinces. Its economic growth has stagnated in the past decade because of limited investment and capital accumulation. The last drought (1997–2002) decimated the livestock population, and rural incomes have been hit the hardest. This province basically lacks a coordinated economic policy and a viable strategy for economic development. It has seen no significant investment in productive streams (such as minerals, agribusiness, and fisheries) and human resource development.

This paper is an attempt to undertake analysis of households' consumption patterns and demand elasticities of under-developed urban and rural Balochistan[1]. Household Integrated Expenditure Survey (HIES) of Pakistan

[1] The Balochistan province of Pakistan has the largest area. It accounts 24 per cent (347,100 km^2) of the total area of Pakistan. Neighboring regions are Iranian Balochistan to the west, Afghanistan and the Federal Administered Tribal Area (FATA) to the north and Punjab and Sindh province to the east. To the south is the Arabian sea. Animal husbandry is the important and trading bazaars through out the province due to its tribal lifestyle.

provides annual data of household income and consumption in Pakistan.

Objective

The objective of this study is to estimate demand elasticities and households' consumption patterns in the urban and rural Balochistan province. The study applies the AIDS model introduced by Deaton and Muellabauer (1980a). In Pakistan, the magnitude of efforts in this area turns out to be too thin with data for the year 2005-06. It will provide biasness if ignored altogether. The rest of the study is organized as follows: Literature review is presented in the following section 2. Next section that is 3, deals with the data set and methodology. Section 4 shows data – descriptive statistics, results and discussion. Finally, section 5 consists of conclusion and policy implication.

Review of Literature

There is an extensive empirical literature on consumer demand analysis and non-income characteristics in developed and under-developed countries. Numerous studies in Pakistan utilize different models and data composition to estimate households' consumption patterns. These include:Mukhtar. H.,(1985), Iqbal.R., and Jamal.H.,(1992), Eatzaz and Arshad(2007), Malik. S., and Aziz. B., (2006), Burney and Khan (1991), Siddiqu R.,(1982), Akhter and Burney (1990), Ahmed, Ludlow and Stern (1988), Sohail and Sarwar (1993), Alderman (1988), Malik (1982) etc.

Sohail and Sarwar (1993) use HIES data of the year 1987-88 to analyze existence or absence of similarity in expenditure pattern relative to with or without remittances for Pakistan. A linear relationship between per capita expenditure and per capita total expenditure whereas domestic and foreign remittances are used as dummy variables. The six linear functional forms are estimated for three expenditure groups i.e. consumption expenditure, durable expenditure and total expenditure (consumption expenditure and durable expenditure).

Siddiqui,R., (1982) examines consumption pattern. She tests the stability of consumer behavior by using the HIES data of the year 1971-72 with pooled data for the years 1968-69 and 1971-72. She also specifies linear and log linear relationship between expenditure on various commodities, household size and income. Five commodity groups and seven food items are taken for aggregated and disaggregated analysis respectively.

Burney and Khan (1991) analyze the consumption pattern in rural and urban sectors of Pakistan by using the HIES data of the year 1984-85 with linear and double log forms. They make groups and divide commodities into twelve major categories namely food and drinks, clothing and foot wear, fuel and lighting, housing, transport and communication, house effects, personal effects, health care, education, entertainment, durables and miscellaneous.

Jamal and Iqbal (1992) attempt to determine regional differences in consumption behavior by using HIES data for the year 1986-88 using ELES (Extended Linear Expenditure System) model in their study.

Eatzaz and Arshad (2007) use a quadratic expenditure system to estimate the household budget analysis for rural and urban sectors of Pakistan. Out of twenty two group categories, ten are defined as food categories and the rests are included in non-food categories. The data is obtained from HIES for the year 2000-01.
Mukhtar, H., (1985) uses ELES in order to estimate the consumer demand for rural-urban Pakistan. The data is taken from HIES for the years 1963, 1964, 1966 (urban sample only), 1968-69, 1970-71, 1971-72 and 1979 (published in 1982). The household monthly expenditures are divided into seven major categories. The comprehensive sub-division of each category is also mentioned.

Alderman (1988) estimates income and price elasticities on consumer demand by using AIDS and expenditure survey for the year 1979 along with urban survey conducted in 1982. Malik, S., and Aziz, B., (2006) follow the time series approach for the analysis of consumer demand and structural changes in

Pakistan. They use LA/AIDS model with time period from 1950-51 to 2003-04.

These comprehensive studies address various issues relating to household consumption pattern in rural-urban households of Pakistan. None of them have analyzed consumption and demand elasticities of food products for Balochistan by applying LA/AIDS and 2005-06 household data tape.

Data and Methodology

The estimations of demand elasticities and households' consumption pattern are based on the Household Income and Expenditure Survey (HIES). This survey was conducted by the Federal Bureau of Statistics on annual basis[2]. We use the survey for 2005-06. The data tapes were being the latest available at the start of this study. The universe of HIES survey consists of all urban and rural areas. The raising factors given in the survey are used to give household weights[3] to correct for over sampling of some provinces or locations. The current study area is the biggest province of Pakistan that is Balochistan. The net sample consists of over 2037 households. The portion of Balochistan households is 13.3 percent in the total samples of Pakistan[4]. The compositions of urban and rural households are respectively 728 and 1309 households.

At the first stage we obtain the monthly quantities consumed (for thirty seven food commodities)[5] and their respective consumption expenditures. The food expenditures include the sum value of paid and consumed, wages and salaries in kind, own produced and consumed receipts from assistance, gift, dowry etc.

In the second stage we construct adult equivalent household size. The demographic categories of households with respect to their age and gender compositions are arranged for this. The demographic categories of households are as follows. The categories of children are between the age of 0 and 05, and the age of 05 and 10. The categories of male adult are between the age of 10 and 15, the age of 15 and 25, the age of 25 and 65 and the age of greater than 65. The categories of female adult are between the age of 10 and 15, the age of 15 and 25, the age of 25 and 40 and the age greater than 40.

The adult equivalent household age and gender size, prices[6] and budget shares of each food item are also reported.

Methodology

In order to attain the central objective of the study, three stages are described here. The first includes the construction of equivalence scales; the second consists of the households' consumption for food commodity groups, per adult equivalent. The final stage applies the Almost Ideal Demand System (AIDS) to estimate a complete demand system for elasticities. The construction of equivalence scales depends on the use of nutritional requirements of different age and gender groups as *"we assign the average calorie requirements to household composition of age and gender as mentioned in the data set. The reference calorie requirement is taken to be 2550 calories for a male adult between the age*

[2] The survey is spread over a year that commences in the first quarter from July and completes by next June. In order to obtain the better quality of data from the female respondents, the relevant parts of consumption expenditure of food and non-food items (fortnightly and monthly) have been included in the female part whereas, information which is considered to be answered better by the male household respondents are included in the male part of the questionnaire.

[3] The weights assigned from lowest 13.75 to the largest 8707.44.

[4] The gross sample consists of over 15453 households and excluded 139 households (139*100/15453=0.89 per cent) from the given recorded sample due to insufficient information regarding their consumption The net sample consists of 15314 households.

[5] Food quantities consumption cover milk ,butter, beef, mutton, chicken ,egg ,fish, banana, apple, grape, mango, ofruit,potato,tomato,cabbge,karela,wsugar,confect,barfee,glucose,bervgs,squash,wheat,rice,otcerl,gram,dalcha,mash, moong,masoor,dghee,bghee,cookoil,ttea,buisct,bread,naan

[6] prices of each item are obtained by dividing households' food expenditure on its quantity consumed. The final data set consist of monthly expenditure and food quantities consumed.

of 25 and 65. The value corresponding to a chosen reference male adult between the age of 25 and 65 is set equal to unity. The values of adult equivalent that correspond to other households of age and gender categories types are then expressed relative to this base".

Estimates of adult equivalents for some households is understated because we have no direct information on adult females which would allow us to incorporate the additional calorie requirements for pregnancy and lactation.

Table 1 depicts the calorie requirements and adult equivalent scales with respect to age and gender compositions. The calorie intakes are respectively 1754 and 1835 units for both gender compositions of the age between 0 and 5 and between 5 and 10. The calorie intakes for male of the age between 10 and 15, 15 and 25, 25 and 65 and greater than 65 are 2300, 2750, 2550 and 2170 units respectively. The calorie intakes for female of the age between 10 and 15, 15 and 25, 25 and 40 and greater than 40 are 2250, 2130, 2160 and 1905 units respectively. The reference calorie requirement is taken to be 2550 calories for a male adult between the age of 25 and 65. The value corresponding to a chosen reference male adult between the age of 25 and 65 is set equal to unity as adult equivalent scale. The values of other adult equivalent scales of age and gender compositions are less than unity except in the case of male with age between 15 and 25.

Table 1: Daily calorie requirements and adult equivalent scales by age and gender

	Calorie Requirements			**Adult Equivalent Scales**		
Age	Both	Male	Female	Both	Male	Female
0 - 5	1754			1754/2550=0.68		
5 – 10	1835			1835/2550=0.71		
10 - 15		2300	2250		2300/2550=0.90	2250/2550=0.88
15 – 25		2750	2130		2750/2550=1.07	2130/2550=0.83
25 – 65		2550			2550/2550=1	
> 65		2170			2170/2550=0.85	
25 - 40			2160			2160/2550=0.84
> 40			1906			1906/2550=0.74

Source: Nutritional compositions of demographic compositions are taken from tables published by the Planning Division (1985) as well as Ercelawn, A., discussion paper (May, 1991).

In the next step we compute the adult equivalent household size on the basis of mentioned adult equivalent scales.

$n_{ad}=0.68n_{c0\text{-}5}+0.71n_{c5\text{-}10}+0.91n_{m10\text{-}15}+1.07n_{m15\text{-}25}+n_{m25\text{-}65}+0.85n_{mg65}+0.88n_{f10\text{-}15}+0.83n_{f15\text{-}25}+0.85n_{f25\text{-}40}+0.74n_{fg40}$.

Where

n_{ad} = Adult Equivalent Household size.

$n_{c0\text{-}5}$ = Children between the age of 0 and 5.

$n_{c5\text{-}10}$ = Children between the age of 5 and 10.

$n_{m10\text{-}15}$ = Male between the age of 10 and 15.

$n_{m15\text{-}25}$ = Male between the age of 15 and 25.

$n_{m25\text{-}65}$ = Male between the age of 25 and 65.

n_{mg65} = Male the age greater than 65.

$n_{f10\text{-}15}$ = Female between the age of 10 and 15.

$n_{f15\text{-}25}$ = Female between the age of 15 and 25.

$n_{f25\text{-}40}$ = Female between the age of 25 and 40.

n_{fg40} = Female the age greater than 40.

The food-expenditure relationship is estimated as:

Food = f (lntexp) ---------- (A)

The dependent variable *food* and independent variable *lntexp* are logarithm of monthly food and total consumption expenditure per adult equivalent respectively. The AIDS model is usually specified by Deaton and Muellabauer (1980a, 1980b) as:

$w_i = \alpha_i + \Sigma \gamma_{ij} Pj + \beta_i ln (x/p)$ ---------- *(1)*

Where w_i is the share of *ith* good in the household's budget; x is total expenditure, P_j is the price of *jth* good, and P is a properly defined price aggregator.

The price aggregator (index) is given by:
$ln P = \Sigma \alpha_i ln (p_i) + 1/2 \Sigma \Sigma \gamma_{ij} ln (p_i) ln (pj)$ ----------*(2)*

To avoid the non-linear estimation due to equation (2), we follow the procedure of Stone (1953) and Ray (1979) with some modification in the form which includes the Demographic compositions of households.

The Stone price index (P^*):
$\ln P^* = \Sigma w_j \ln (p_i)$ ----------(3)
The resulting model is called the "Linear Approximate AIDS" (LA/AIDS):
$w_i = \alpha_i + \Sigma \gamma_{ij} P_j + \beta_i \ln (x/p^*) + \Sigma \varphi_i z_k$---- (4)
In equation (4), x is per adult equivalent expenditure of household. z_k is adult equivalent age and gender demographic groups of household[7]
The following formulae are obtained (see the study by Ahmed, U.A. and Shams,Y., (1994) for derivation) for expenditure Єi and uncompensated own and cross price elasticity eij.
Єi = 1+ (βi / Wi) ---------(5)
eij = (γij -βiwj) /wi – σij ----------(6)

The values of eij are 1 and zero in the case of own price and cross price elasticity respectively. The compensated own and cross price elasticities can be computed by using the Slutsky equation in elasticity form:
eij = e^H_{ij} - wj Єi ----------(7)
where e^H_{ij} is the compensated (Hicksian) price elasticity.

Data – Descriptive Statistics, Results and Discussion

In this section we include data-descriptive statistics with respect to Balochistan and its both urban and rural areas.
Table 2 reports average members of households. The average members of adult equivalent household size for total area of Baluchistan that is both urban and rural areas are 6.67, 7.11 and 6.42 respectively. The total households are respectively 2037, 728 and 1309.

Average monthly food and total expenditure per adult equivalent are reported in Table 3. Average monthly food consumption expenditures are Rs.146.47, Rs.181.96 and Rs.126.74 respectively. The average total monthly expenditures are Rs.407.97, Rs.538.37 and Rs.310.42. The average monthly food and total expenditure of urban areas are larger than rural areas of Balochistan.

The average monthly budget shares of different items in percentage are reported in Table 4. The percentage budget share of wheat is larger than others. The average monthly wheat budget shares are 11.61, 8.84 and 13.15 percent. The total monthly budget shares of selected food items are 35.57, 29.83 and 38.78 per cent respectively. The share of rural households is larger than other.

[7] age and gender demographic groups are z1= children between the age of 0 and 15, z2= male the age greater than 14 and z3= female the age greater than 14 respectively

Table -2 Household size and Adult Equivalent (A.E) household size, 2005-06

Area	Households	A.E household size
Balochistan	2037	6.67
Urban Balochistan	728	7.11
Rural Balochistan	1309	6.42

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table-3 Average monthly food and total expenditure per adult equivalent

Area	Food (Rs.)	Total Exp.(Rs.)	Households
Balochistan	146.47	407.97	2037
Urban Balochistan	181.96	538.37	728
Rural Balochistan	126.74	310.42	1309

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table- 4 Average monthly budget share of different food items[8] (in %)

	Area		
Food Series	**Balochistan**	**Urban Balochistan**	**Rural Balochistan**
Milk	5.55	4.958319	5.875921
Beef	2.18	2.150046	2.202874
Mutton	2.11	1.868382	2.243211
Chicken	2.05	1.731965	2.229165
Wheat	11.61	8.846313	13.15205
Rice	1.75	1.619273	1.819424
Sugar	4.06	3.500503	4.37236
Banaspati Ghee	4.54	3.678358	5.025664
Tea	1.72	1.477122	1.86275
Total	35.57	29.83028	38.78342

Source: Computed by authors based on HIES data of Pakistan for the year 2005-

[8] we report the average monthly budget share of selected food items only

The Food-expenditure relationship

The food-expenditure relationship is presented in Figures 1 to 3. Figure 1 shows the food-expenditure relationship for overall households of Balochistan. Figures 1 and 2 depict the food-expenditure relationship for the urban and rural households respectively.
The households' food consumption expenditure is increasing at decreasing rate. This implies that when total expenditure (income) is increasing, households' food consumption expenditure is also increasing with less proportion.
Figure 1 indicates that 85% households of Balochistan per adult equivalent expenditure (income) in the range Rs. 0-2000, while the correspondence expenditure on food is in the range Rs. 0-400.

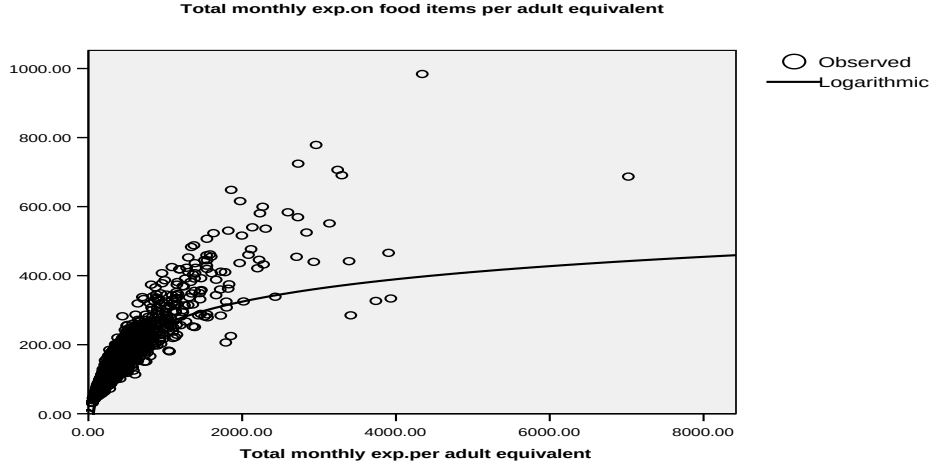

Figure 1 Food-expenditure relationship: Balochistan (2005-06)

Figures 2 and 3 indicate that per adult equivalent expenditure (Income) of 88% urban and rural households are Rs.0-1500 and Rs.0-1000 per month and expenditure on food are Rs.0-450 and Rs.0-250 per month.

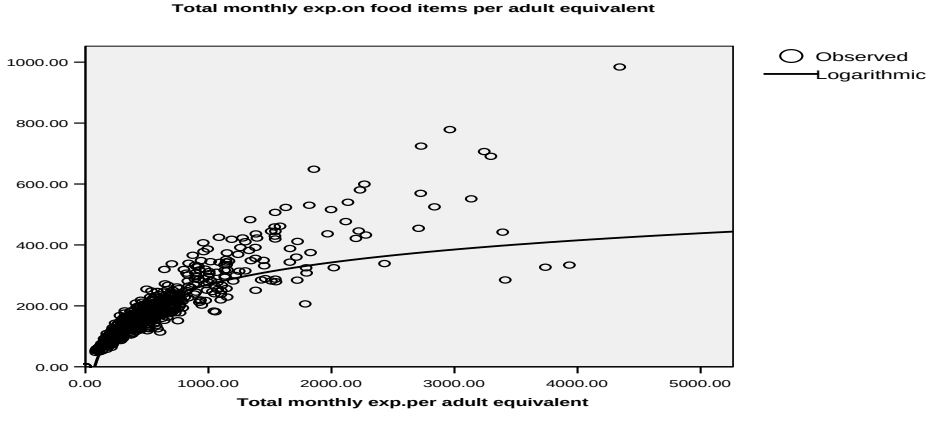

Figure 2 Food-expenditure relationship: Urban Balochistan (2005-06)

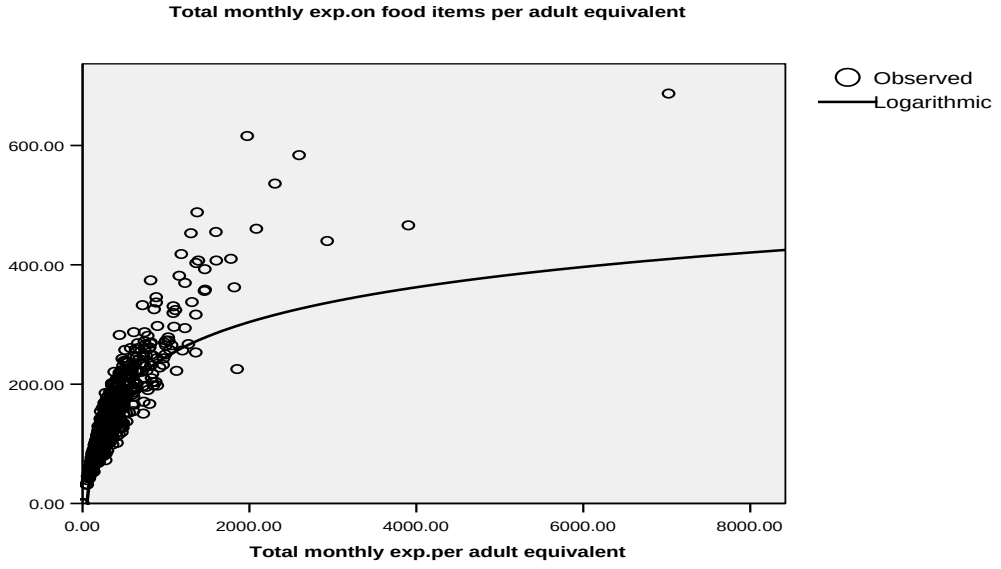

Figure 3 Food-expenditure relationship: Rural Balochistan (2005-06)

Analytical tools of central importance are the price elasticity, expenditure elasticities and cross price elasticity of demand. The price elasticity of demand is a quantitative measure of the responsiveness of purchase decisions to variations in price. The price elasticities of demand for different items and regions often differ substantially.

Income (expenditure) may be interpreted as the percentage change in quantity demand when income (expenditure) changes roughly by one percent. It indicates the nature of different commodity items. Similarly, the cross price elasticity indicates the causal relationship of different commodity items. The quantity of a commodity purchased in the market depends not only on its price and household's income but also on the price of related commodities. Cross elasticity of demand by definition is the percentage change in the quantity demanded of one commodity caused by one percent change in the price of other items. The cross price elasticity may be positive or negative. In the case of complement goods cross price elasticity is negative and is positive for substitute goods.

In the following section we examine the estimates of uncompensated and compensated own-price elasticities and income (expenditure) elasticities of different food items.

From Table 5, it is clear that signs of own price elasticities satisfy the economic criteria. The low uncompensated price elasticity for gram, masoor, potato, tomato and mash probably reflect the fact that households in this market have much larger than average income. This implies that the income effects of price variations are likely to be small. The larger values of different food items like glucose, butter, and biscuit imply that there exist many close substitutes for them than other food items. Low expenditure elasticities reflect that households have to spend on these items irrespective of the level of their income (expenditure). All the food items are considered as necessities in the case of Balochistan. This implies that the expenditure on these items does not vary greatly with households' total expenditure.

Table 5: Own price and expenditure elasticities of selected food items: Balochistan (2005-06)

	Own Price Elasticities		
Commodity	**Uncompensated**	**Compensated**	**Expenditure Elasticities**
Milk	-0.68242	-0.63747	0.81
Butter	-7.82787	-7.82688	0.71
Sugar	-0.69852	-0.66726	0.77
Glucose	-19.6169	-19.6167	0.73
Tea	-1.24412	-1.23105	0.76
Biscuit	-2.18031	-2.17842	0.90
Beef	-0.6317	-0.6162	0.71
Mutton	-0.50421	-0.48924	0.71
Chicken	-0.59607	-0.58171	0.70
Potato	-0.42472	-0.41337	0.70
Tomato	-0.4875	-0.4832	0.68
Karela	-0.54375	-0.53763	0.67
Gram	-0.2379	-0.2368	0.52
Dalchana	-0.52651	-0.52423	0.69
Mash	-0.45281	-0.45065	0.68
Masoor	-0.32298	-0.32201	0.54
Vegetable Ghee	-0.81567	-0.7825	0.73
Wheat	-0.666	-0.58935	0.66
Rice	-0.63814	-0.01579	0.88
Other cereal	-11.2879	-11.2878	0.60
Moong	-0.56326	-0.56068	0.72

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 6 provides a detailed report on own price compensated and uncompensated expenditure elasticities for the urban region of Balochistan. The estimates suggest that urban households are quite responsive to change in prices in adjusting their food items consumption. The absolute value of wheat and rice for example is small indicating that there exist less close substitutes for them than other food items. The estimated own-price elasticities indicate if, for example, the wheat price fall by 10 per cent then demand for wheat would increase by 6.6 per cent. Of this total increase in demand, only 5.8 per cent is purely due to price effect (i.e, the substitution effect) as the compensated elasticity suggests. The income effect is relatively large in wheat demand because wheat has a largest share in household budget. The demand for rice would increase by 13.2 per cent (i.e., 6.6 + 6.6) if per adult equivalent income increases by 10 per cent.

Table 6: Own price and expenditure elasticities of selected food items: Urban Balochistan (2005-06)

	Own Price Elasticities		
Commodity	**Uncompensated**	**Compensated**	**Expenditure Elasticities**
Milk	-0.76752	-0.72245	0.90929
Butter	-3.824	-3.82335	0.709613
Sugar	-0.767	-0.73863	0.802304
Glucose	-16.414	-16.4141	0.919252
Tea	-1.289	-1.27651	0.813369
Biscuit	-2.086	-2.0842	0.944781
Beef	-0.68312	-0.6687	0.671324
Mutton	-0.54207	-0.52757	0.77582
Chicken	-0.61794	-0.60441	0.782431
Potato	-0.36235	-0.35324	0.743936
Tomato	-0.46999	-0.46594	0.748451
Karela	-0.62008	-0.61418	0.723677
Gram	-0.22838	-0.22724	0.667798
Dalchana	-0.5667	-0.56396	0.978025
Mash	-0.46485	-0.46329	0.698119
Masoor	-0.31981	-0.31848	0.787517
Vegetable Ghee	-0.84341	-0.80616	1.012091
Wheat	-0.666	-0.58935	0.660036
Rice	-0.63814	-0.62276	0.874009
Other cereal	-11.2879	-11.2878	0.676006
Moong	-0.56326	-0.56068	0.710404

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

The estimates of uncompensated and compensated own price elasticities and expenditure elasticities for the households of rural Balochistan obtained from the LA/AIDS model are reported in Table 7.

The own uncompensated and compensated price elasticities of food items have elastic and inelastic behavior. The similar conditions exist for these items as in the case of urban Balochistan. The food items like butter, biscuit and other cereal have elastic price elasticities. This implies that they have larger substitute items than other. The food items like milk, butter, sugar, biscuit, beef, mutton, chicken, potato, wheat, etc are considered necessities. The expenditure elasticity of these items is less than one. The expenditure elasticity for vegetable ghee is greater than one which implies that when households' income changes, there will be larger change in its consumption.

Table 7: Own price and expenditure elasticities of selected. food items: Rural Balochistan (2005-06)

	Own Price Elasticities		
Commodity	**Uncompensated**	**Compensated**	**Expenditure Elasticities**
Milk	-0.63862	-0.59099	0.9
Butter	-7.82787	-7.82688	0.71
Sugar	-0.69852	-0.66726	0.8
Glucose	-19.6169	-19.6167	0.91
Tea	-1.24412	-1.23105	0.81
Biscuit	-2.18031	-2.17842	0.94
Beef	-0.60863	-0.59301	0.67
Mutton	-0.53278	-0.48924	0.77
Chicken	-0.62796	-0.58171	0.78
Potato	-0.49223	-0.41337	0.74
Tomato	-0.52994	-0.4832	0.75
Karela	-0.56993	-0.53763	0.72
Gram	-0.32668	-0.2368	0.67
Dalchana	-0.56505	-0.52423	0.98
Mash	-0.51723	-0.45065	0.69
Masoor	-0.38688	-0.32201	0.78
Vegetable Ghee	-0.83239	-0.7825	1.012
Wheat	-0.51789	-0.4311	0.66
Rice	-0.63814	-0.62276	0.87
Other cereal	-11.2879	-11.2878	0.67
Moong	-0.56326	-0.56068	0.71

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Cross-price elasticities

Tables 8 to 24 provide the entire uncompensated and compensated price elasticities matrices for Balochistan and its both sectors. We arrange the food items into three separate groups. The first group includes milk, butter, sugar, glucose, tea and biscuit respectively. The second includes beef, mutton, chicken, potato, tomato, karela, gram, dal chana, dal mash, masoor, and vegetable ghee; the last one includes wheat, rice, other cereal, mash, masoor, dal chana, moong, vegetable ghee. The groups are formed here in order to check the nature of items with respect to substitutes and complements. We estimate the LA/AIDS model for each groups separately.

In each case we estimate three separate LA/AIDS models. In the case of uncompensated cross price elasticities, the gross effects include both the substitution and income effects. The pure price effects are presented in the form of compensated cross price elasticities. In the case of Balochistan, milk and sugar have complementary relationship either with respect to price of milk or with respect to price of sugar. The behavior of sugar and tea is gross substitutes with each other (Table 8). A ten per cent increase in milk price would result in a 0.5 per cent decreased demand for sugar.

The cross price elasticity between beef and mutton is negative with each other (Table 9) which implies that they have complementary relationships. The economic theory suggests that these goods should be substitutes. However ,in our study, they have complementary behavior. With respect to price of chicken the cross price elasticity between chicken and mutton is positive. This implies that they have the substitute relationships with each other. A 10 per cent increase in chicken price would result in 0.04 per cent increased demand for mutton. The cross price elasticity between wheat and rice is positive (Table 10) which implies that they are substitutes with respect to price of wheat. But with respect to price of rice they have complement relationships. The same condition exists in the case of most food items like milk and butter, mutton and chicken, wheat and other cereal, etc.

The compensated cross price elasticity between milk and sugar is negative (Table 11) implying that they have net complementary relationship with each other. In case of beef and mutton the cross price elasticity is also negative (Table 12) showing that there exists a net complementary relationship. The compensated cross price elasticity between wheat and rice includes the same relationship with each other.

Some cross-price elasticities change signs between their uncompensated and compensated forms. In the case of milk and tea, they are gross complements (Table 8). However, in the case of compensated cross price elasticity they have net substitute relationships (Table 11).

Table 8: Uncompensated own and cross price elasticities of food products: Balochistan (2005-06)

	Demand for					
Price of	**Milk**	**Butter**	**Sugar**	**Glucose**	**Tea**	**Biscuits**
Milk	**-0.682**	0.263109	-0.05126	0.065651	-0.00845186	-0.019762
Butter	-0.204	**-7.82787**	-0.00015	0.1569224	0.03630835	0.0087516
Sugar	-0.13	0.138562	**-0.69852**	-0.3412145	0.02134265	0.1998588
Glucose	0.0947	0.079691	-0.00273	**-19.6169**	-0.00012381	0.1864429
Tea	0.1492	0.292009	0.04862	0.1521537	**-1.244118**	0.0544421
Biscuits	-0.029	-0.13797	0.04236	0.0496187	-0.00939043	**-2.1803**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 9: Uncompensated own and cross price elasticities of food products: Balochistan (2005-06*)*

	Demand for										
Price of	Beef	Mutton	Chicken	Potato	Tomato	Karela	Gram	Dalcha	Mash	Masoor	Bghee
Beef	**-0.6317**	-0.0423	-0.0301	-0.0254	-0.0055	-0.0252	0.0034	-0.0194	-0.0207	0.0007	0.0092
Mutton	-0.0356	**-0.5042**	-0.0145	-0.0014	-0.0023	-0.0307	-0.0084	-0.0218	0.0017	-0.0208	-0.0092
Chicken	-0.0495	0.0044	**-0.5961**	0.0246	0.0283	-0.0610	-0.0092	-0.0163	-0.0031	-0.0098	-0.0020
Potato	-0.0170	-0.5031	-0.1636	**-0.4247**	-0.0453	-0.1536	-0.0519	-0.0754	-0.0081	-0.1592	-0.0246
Tomato	0.0084	-0.0498	0.0044	0.0570	**-0.4875**	-0.0776	-0.0205	-0.0996	0.0110	-0.0667	-0.0142
Karela	-0.0335	-0.0268	0.0055	-0.0566	-0.0089	**-0.5438**	0.0320	0.0070	0.0214	0.0049	0.0099
Gram	-0.0039	-0.0092	-0.0135	0.0096	0.0336	0.0157	**-0.2379**	-0.0084	-0.0507	-0.0131	0.0012

Dacha	-0.0196	0.0033	-0.0041	-0.0031	-0.0119	-0.0779	-0.0052	**-0.5265**	-0.0642	-0.0394	-0.0163
Mash	0.0153	0.0577	0.0063	0.0005	0.0211	-0.0865	0.0082	-0.0300	**-0.4528**	-0.0114	0.0131
Masoor	0.0120	-0.0137	-0.0027	-0.0221	0.0133	-0.0002	-0.0289	-0.0515	-0.0558	**-0.3230**	-0.0104
Bghee	0.0022	-0.0194	-0.0018	-0.0260	-0.0125	0.0179	-0.0276	-0.0032	0.0059	-0.0288	**-0.8157**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 10: Uncompensated own and cross price elasticities of food products: Balochistan (2005-06)

	Demand for							
Price of	**Wheat**	**Rice**	**Otcereal**	**Dalcha**	**Mash**	**Moong**	**Masoor**	**Bghee**
Wheat	**-0.666**	0.22856	-0.365048	0.09424	0.1647748	0.13055	-0.006057	-0.0178951
Rice	-0.06194	**-0.63814**	0.183393	-0.082753	-0.038839	-0.09171	-0.065308	0.01009427
Otcereal	0.02535	0.133795	**-11.28788**	0.021993	0.0068952	0.02277	0.003776	0.00665067
Dalcha	-0.01781	0.007395	-0.079922	**-0.53408**	-0.066048	-0.05007	-0.049712	-0.0210149
Mash	0.01764	-0.15685	0.121769	-0.034632	**-0.45136**	-0.02914	-0.018919	0.01148761
Moong	0.00648	-0.00552	0.151358	-0.078427	-0.089905	**-0.5633**	-0.039163	-0.0078842
Masoor	-0.00727	-0.06562	-0.070671	-0.051662	-0.05349	-0.02702	**-0.322731**	-0.0119401
Bghee	-0.0025	-0.02793	0.040453	0.000354	0.0054154	-0.01458	-0.029765	**-0.8115251**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table-11: Compensated own and cross price elasticities of food products: Balochistan (2005-06)

	Demand for					
Price of	**Milk**	**Butter**	**Sugar**	**Glucose**	**Tea**	**Biscuits**
Milk	**-0.637466**	0.3025138	-0.0085266	0.106166037	0.033728142	0.030188434
Butter	-0.2030425	**-7.82687**	0.00093038	0.157944379	0.037372354	0.010011619
Sugar	-0.0973238	0.1673878	**-0.667262**	-0.31157651	0.052198654	0.236398812
Glucose	0.09499288	0.0799043	-0.002496	**-19.616695**	0.000104191	0.186712879
Tea	0.16309845	0.3042212	0.06186446	0.16470973	**-1.23104664**	0.069922118
Biscuits	-0.0276911	-0.136475	0.04397877	0.051151685	-0.00779443	**-2.17841822**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 12: Compensated own and cross price elasticities of food products: Balochistan (2005-06)

	Demand for										
Price of	Beef	Mutton	Chicken	Potato	Tomato	Karela	Gram	Dalcha	Mash	Masoor	Bghee
Beef	**-0.616**	-0.0268	-0.015	-0.010	0.0094	-0.0105	0.0147	-0.0044	-0.006	0.0105	0.0251
Mutton	-0.0206	**-0.4892**	0.0003	0.01336	0.012	-0.0166	0.0025	-0.0073	0.016	-0.0113	0.0062
Chicken	-0.0349	0.0189	**-0.5817**	0.03895	0.0422	-0.0473	0.0015	-0.0021	0.0109	-0.0006	0.013
Potato	-0.0055	-0.4916	-0.1522	**-0.4134**	-0.034	-0.1427	-0.044	-0.065	0.0029	-0.1519	-0.013
Tomato	0.0129	-0.0453	0.0089	0.06143	**-0.483**	-0.0734	-0.0172	-0.0953	0.0153	-0.0638	-0.01
Karela	-0.027	-0.0203	0.0119	-0.0502	-0.003	**-0.5376**	0.0367	0.0133	0.0276	0.009	0.0166
Gram	-0.0024	-0.0077	-0.012	0.01111	0.035	0.01711	**-0.2368**	-0.0069	-0.049	-0.0121	0.0027
Dacha	-0.0173	0.0057	-0.0018	-0.0008	-0.01	-0.0757	-0.0035	**-0.5242**	-0.062	-0.0379	-0.014
Mash	0.0175	0.0599	0.0085	0.00275	0.0232	-0.0844	0.0098	-0.0278	**-0.451**	-0.0099	0.0154
Masoor	0.0136	-0.0122	-0.0012	-0.0206	0.0148	0.00127	-0.0277	-0.05	-0.054	**-0.322**	-0.009
Bghee	0.0344	0.0129	0.03	0.00581	0.0184	0.04831	-0.004	0.0281	0.0368	-0.0083	**-0.783**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-0

Table 13: Compensated own and cross price elasticities of food products: Balochistan (2005-06)

	Demand for							
Price of	Wheat	Rice	Otcereal	Dalcha	Mash	Moong	Masoor	Bghee
Wheat	-0.5893	-0.27284	-0.295368	0.1743709	0.2437448	0.21416	0.0566546	0.066882
Rice	-0.0504	-0.0157	0.1938799	-0.0706922	-0.0269536	-0.079121	-0.055869	0.022854
Otcereal	0.02544	0.01693	-11.2878	0.0220854	0.0069865	0.022863	0.0038482	0.006749
Dalcha	-0.0156	0.0103	-0.077938	-0.531799	-0.0637994	-0.04769	-0.047927	-0.0186
Mash	0.01974	-0.15406	0.1236742	-0.0324412	-0.449200	-0.026851	-0.017205	0.013806
Moong	0.00885	-0.00236	0.1535106	-0.0759515	-0.0874659	-0.56067	-0.037226	-0.00527
Masoor	-0.0058	-0.0637	-0.069367	-0.0501625	-0.0520125	-0.02546	-0.321558	-0.01035
Bghee	0.02749	0.01205	0.0677182	0.0317087	0.0363156	0.018141	-0.005227	-0.77835

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Tables 14-19 show the uncompensated and compensated own and cross price elasticities of food items for urban Balochistan. The cross price elasticity between milk and butter is positive with respect to price of milk. This implies that they have the gross substitute relationship. A 10 per cent increase in the price of milk responses a 1.45 per cent increase in the demand of butter. With respect to price of sugar, the uncompensated elasticity between sugar and tea is negative, while it is positive with respect to price of tea (Table 14).

Beef and mutton have complementary relationships with each other (Table 15). A 10 per cent fall in beef price would result in 0.58 per cent increased demand for mutton. The cross elasticity indicates the effect of change in beef price on mutton demand in our explanation. Wheat and rice indicate the mixed trend for each other (Table 16). The uncompensated cross price elasticity between wheat and rice are positive with respect to price of wheat. It is negative with respect to price of rice. The same condition exists for most of the food items. However, in the case of negative cross price elasticity, the food items are gross substitutes and gross complements in the case of negative uncompensated cross price elasticity.

Table 14: Uncompensated own and cross price elasticities of food products Urban Balochistan (2005-06)

	Demand for					
Price of	**Milk**	**Butter**	**Sugar**	**Glucose**	**Tea**	**Biscuits**
Milk	**-0.7675239**	0.145	-0.065	0.115	-0.014	0.010
Butter	-0.0055089	**-3.824**	-0.060	0.164	0.019	-0.051
Sugar	-0.1744043	-0.341	**-0.767**	-0.200	-0.006	0.172
Glucose	0.11187325	-0.393	-0.026	**-16.414**	-0.010	0.323
Tea	0.14285467	0.504	0.019	-0.080	**-1.289**	0.157
Biscuits	-0.0196585	-0.373	0.028	-0.048	-0.024	**-2.086**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 15: Uncompensated own and cross price elasticities of food products: ***Urban Balochistan (2005-06)***

	Demand for										
Price of	**Beef**	**Mutton**	**Chicken**	**Potato**	**Tomato**	**Karela**	**Gram**	**Dalcha**	**Mash**	**Masoor**	**Bghee**
Beef	**-0.683**	-0.058	-0.0303	-0.032	-0.023	-0.0369	0.0092	-0.0215	-0.009	-0.008	0.01183
Mutton	-0.045	**-0.542**	-0.0205	-0.025	-0.02	-0.0313	-0.0129	-0.0349	-0.033	-0.021	-0.0095
Chicken	-0.051	-0.032	**-0.6179**	0.016	0.0163	-0.0841	-0.0237	-0.0259	-0.026	-0.022	-0.0074
Potato	-0.252	-0.009	-0.1864	**-0.362**	-0.055	-0.1734	-0.1101	0.02717	-0.023	0.1538	0.04017
Tomato	0.0363	-0.051	-0.0071	0.083	**-0.47**	-0.1291	-0.0888	-0.0832	-0.008	-0.047	-0.0347
Karela	-0.088	-0.011	0.0357	-0.01	0.0171	**-0.620**	0.0557	0.01123	0.015	0.0015	0.02473
Gram	0.0173	0.0127	-0.0111	0.027	0.029	0.0446	**-0.229**	0.00016	-6E-04	0.0081	0.00719
Dacha	-0.004	0.0028	-0.0056	-0.032	0.0041	-0.0688	-0.034	**-0.5667**	-0.033	-0.027	-0.0333
Mash	-0.002	0.0356	0.0062	-0.022	0.0259	-0.0935	0.0259	-0.0336	**-0.465**	-0.037	-0.0088
Masoor	0.0039	-0.038	-0.008	-0.008	0.0036	-0.0179	-0.0366	-0.0486	-0.046	**-0.32**	-0.0161
Bghee	-0.011	-0.08	-0.0099	0.008	0.0084	0.0727	-0.0465	-0.0182	-0.031	-0.051	**-0.8434**

Table 16: Uncompensated own and cross price elasticities of food products: Urban Balochistan (2005-06)

	Demand for							
Price of	**Wheat**	**Rice**	**Otcereal**	**Dalcha**	**Mash**	**Moong**	**Masoor**	**Bghee**
Wheat	**-0.666**	0.2286	-0.365	0.094	0.1648	0.1305	-0.0061	-0.0179
Rice	-0.062	**-0.638**	0.1834	-0.083	-0.039	-0.0917	-0.0653	0.01009
Otcereal	0.0254	0.1338	**-11.288**	0.022	0.0069	0.0228	0.0038	0.00665
Dalcha	-0.018	0.0074	-0.0799	**-0.534**	-0.066	-0.0501	-0.0497	-0.021
Mash	0.0176	-0.157	0.1218	-0.035	**-0.451**	-0.0291	-0.0189	0.01149
Moong	0.0065	-0.006	0.1514	-0.078	-0.09	**-0.5633**	-0.0392	-0.0079
Masoor	-0.007	-0.066	-0.0707	-0.052	-0.053	-0.027	**-0.3227**	-0.0119
Bghee	-0.003	-0.028	0.0405	4E-04	0.0054	-0.0146	-0.0298	**-0.8115**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 17: Compensated own and cross price elasticities of food products: Urban Balochistan (2005-06)

	Demand for					
Price of	**Milk**	**Butter**	**Sugar**	**Glucose**	**Tea**	**Biscuits**
Milk	**-0.722**	0.1803	-0.0255	0.16	0.0261	0.0573
Butter	-0.005	**-3.823**	-0.0593	0.164	0.0194	-0.05
Sugar	-0.143	-0.316	**-0.7386**	-0.167	0.0219	0.205
Glucose	0.1121	-0.393	-0.0257	**-16.41**	-0.009	0.3236
Tea	0.1563	0.5141	0.0304	-0.067	**-1.277**	0.1712
Biscuits	-0.018	-0.372	0.0297	-0.046	-0.022	**-2.0842**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 18: Compensated own and cross price elasticities of food products: ***Urban Balochistan (2005-06)***

	Demand for										
Price of	Beef	Mutton	Chicken	Potato	Tomato	Karela	Gram	Dalcha	Mash	Masoor	Bghee
Beef	**-0.669**	-0.041	-0.0135	-0.016	-0.007	-0.0214	0.0236	-0.0005	0.005	0.0087	0.03359
Mutton	-0.032	**-0.528**	-0.0059	-0.011	-0.006	-0.0178	-0.0004	-0.0166	-0.02	-0.006	0.00945
Chicken	-0.039	-0.019	**-0.6044**	0.029	0.0292	-0.0716	-0.0121	-0.009	-0.014	-0.009	0.01011
Potato	-0.243	0.0008	-0.1767	**-0.353**	-0.046	-0.1645	-0.1019	0.0392	-0.015	0.1634	0.05261
Tomato	0.0401	-0.047	-0.0029	0.087	**-0.466**	-0.1252	-0.0852	-0.0779	-0.004	-0.043	-0.0292
Karela	-0.083	-0.005	0.0421	-0.004	0.0232	**-0.615**	0.0612	0.01925	0.021	0.0079	0.03303
Gram	0.0185	0.014	-0.0097	0.028	0.0303	0.0459	**-0.227**	0.00183	6E-04	0.0094	0.00891
Dacha	-0.002	0.0049	-0.0034	-0.03	0.0062	-0.0668	-0.0321	**-0.564**	-0.031	-0.025	-0.0305
Mash	0.0001	0.0374	0.008	-0.021	0.0276	-0.0918	0.0274	-0.0313	**-0.46**	-0.035	-0.0065
Masoor	0.0051	-0.036	-0.0067	-0.007	0.0049	-0.0166	-0.0354	-0.047	-0.045	**-0.318**	-0.0144
Bghee	0.0148	-0.051	0.0189	0.035	0.036	0.0992	-0.0218	0.01775	-0.006	-0.022	**-0.8062**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 19: Compensated own and cross price elasticities of food products: Urban Balochistan (2005-06)

	Demand for							
Price of	**Wheat**	**Rice**	**Otcereal**	**Dalcha**	**Mash**	**Moong**	**Masoor**	**Bghee**
Wheat	**-0.589**	0.3308	-0.2954	0.174	0.2437	0.2142	0.0567	0.06688
Rice	-0.05	**-0.623**	0.1939	-0.071	-0.027	-0.0791	-0.0559	0.02285
Otcereal	0.0254	0.1339	**-11.288**	0.022	0.007	0.0229	0.0038	0.00675
Dalcha	-0.016	0.0103	-0.0779	**-0.532**	-0.064	-0.0477	-0.0479	-0.0186
Mash	0.0197	-0.154	0.1237	-0.032	**-0.449**	-0.0269	-0.0172	0.01381
Moong	0.0088	-0.002	0.1535	-0.076	-0.087	**-0.5607**	-0.0372	-0.0053
Masoor	-0.006	-0.064	-0.0694	-0.05	-0.052	-0.0255	**-0.3216**	-0.0104
Bghee	0.0275	0.0121	0.0677	0.032	0.0363	0.0181	-0.0052	**-0.7784**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 20-25 present the uncompensated and compensated own and cross price elasticities in the case of rural Balochistan. Uncompensated price elasticity between sugar and tea is positive. This implies that they have substitute relationship with each other (Table20). A 10 per cent increase in the price of sugar will increase 0.2 per cent in the demand of tea. The relationship between beef and mutton, beef and chicken, mutton and chicken, etc. are gross complements with each other. A rise in the price of beef will reduce not only the quantity demand of beef, but also, because beef and mutton are complements the demand for mutton. From the Table 25, it is clear that with respect to price of wheat the cross price elasticities are substitutes in the case of rice, dalchana, mash, moong, masoor, and vegetable ghee, respectively. A rise in the price of wheat will increase the demand for them. There exists approximately similar condition as in the case of rural Balochistan and urban Balochistan with reference to compensated own and cross-price elasticities.

Table 20: Uncompensated own and cross price elasticities of food products: Rural Balochistan (2005-06)

	Demand for					
Price of	**Milk**	**Butter**	**Sugar**	**Glucose**	**Tea**	**Biscuits**
Milk	**-0.6386**	0.2631	-0.0513	0.06565	-0.00845	-0.01976
Butter	-0.2414	**-7.8279**	-0.0001	0.15692	0.03631	0.00875
Sugar	-0.1325	0.1386	**-0.6985**	-0.34121	0.02134	0.19986
Glucose	0.05606	0.0797	-0.0027	**-19.6169**	-0.00012	0.18644
Tea	0.15787	0.292	0.04862	0.15215	-1.24412	0.05444
Biscuits	-0.0314	-0.138	0.04236	0.04962	-0.00939	**-2.18031**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 21: Uncompensated own and cross price elasticities of food products: Rural Balochistan (2005-06)

	Demand for										
Price of	Beef	Mutton	Chicken	Potato	Tomato	Karela	Gram	Dalcha	Mash	Masoor	Bghee
Beef	**-0.6086**	-0.0397	-0.0276	-0.02232	-0.005	-0.0237	0.003	-0.0178	-0.0182	0.0007	0.00832
Mutton	-0.0312	**-0.5328**	-0.013	-0.00088	-0.00179	-0.0286	-0.0071	-0.0197	0.0019	-0.0185	-0.008
Chicken	-0.0471	0.0046	**-0.628**	0.02217	0.02636	-0.057	-0.0076	-0.0145	-0.0021	-0.0084	-0.0014
Potato	0.05855	-0.4731	-0.1499	**-0.4922**	-0.04102	-0.1442	-0.0452	-0.0687	-0.0065	-0.1435	-0.0218
Tomato	-0.023	-0.0467	0.00422	0.05041	**-0.5299**	-0.073	-0.018	-0.0913	0.0099	-0.0602	-0.0127
Karela	-0.0162	-0.0251	0.00521	-0.04971	-0.00801	**-0.569**	0.0284	0.0066	0.019	0.0046	0.00908
Gram	-0.0175	-0.0086	-0.0123	0.00856	0.03085	0.0149	**-0.326**	-0.0076	-0.0446	-0.0118	0.00113
Dacha	-0.0222	0.0032	-0.0037	-0.00263	-0.01086	-0.0733	-0.0045	**-0.565**	-0.0565	-0.0356	-0.0147
Mash	0.02867	0.0544	0.00592	0.00058	0.01943	-0.0814	0.0073	-0.0275	**-0.517**	-0.0102	0.01192
Masoor	0.01532	-0.0129	-0.0024	-0.01945	0.01225	-0.0001	-0.0254	-0.0473	-0.0492	**-0.3869**	-0.0093
Bghee	-0.0382	-0.0105	-0.0223	-0.0691	0.00572	-0.0758	-0.0875	-0.0597	-0.0612	-0.0662	**-0.0447**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 22: Uncompensated own and cross price elasticities of food products: Rural Balochistan (2005-06)

	Demand for							
Price of	**Wheat**	**Rice**	**Otcereal**	**Dalcha**	**Mash**	**Moong**	**Masoor**	**Bghee**
Wheat	**-0.5179**	0.2286	-0.365	0.09424	0.16477	0.1305	-0.0061	-0.0179
Rice	-0.0715	**-0.6381**	0.18339	-0.08275	-0.03884	-0.0917	-0.0653	0.0101
Otcereal	0.01218	0.1338	**-11.288**	0.02199	0.0069	0.0228	0.0038	0.0067
Dalcha	-0.0193	0.0074	-0.0799	**-0.53408**	-0.06605	-0.0501	-0.0497	-0.021
Mash	0.01927	-0.1568	0.12177	-0.03463	**-0.45136**	-0.0291	-0.0189	0.0115
Moong	0.00843	-0.0055	0.15136	-0.07843	-0.08991	**-0.5633**	-0.0392	-0.0079
Masoor	-0.0096	-0.0656	-0.0707	-0.05166	-0.05349	-0.027	**-0.3227**	-0.0119
Bghee	-0.0007	-0.0279	0.04045	0.00035	0.00542	-0.0146	-0.0298	**-0.8115**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 23: Compensated own and cross price elasticities of food products: Rural Balochistan (2005-06)

	Demand for					
Price of	**Milk**	**Butter**	**Sugar**	**Glucose**	**Tea**	**Biscuits**
Milk	**-0.59099**	0.302514	-0.00853	0.106166	0.033728	0.030188
Butter	-0.23991	**-7.82688**	0.00093	0.157944	0.037372	0.010012
Sugar	-0.09712	0.167388	**-0.66726**	-0.31158	0.052199	0.236399
Glucose	0.056299	0.079904	-0.0025	**-19.6167**	0.000104	0.186713
Tea	0.172932	0.304221	0.061864	0.16471	**-1.23105**	0.069922
Biscuits	-0.02968	-0.13647	0.043979	0.051152	-0.00779	**-2.17842**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 24: Compensated own and cross price elasticities of food products: Rural Balochistan (2005-06)

	Demand for										
Price of	Beef	Mutton	Chicken	Potato	Tomato	Karela	Gram	Dalcha	Mash	Masoor	Bghee
Beef	**-0.593**	-0.027	-0.0148	-0.0101	0.0094	-0.011	0.0147	-0.0044	-0.0058	0.01054	0.0251
Mutton	-0.0153	**-0.489**	0.00028	0.01336	0.012	-0.017	0.0025	-0.0073	0.016	-0.0113	0.0062
Chicken	-0.0313	0.0189	**-0.5817**	0.03895	0.0422	-0.047	0.0015	-0.0021	0.01087	-0.0006	0.013
Potato	0.07161	-0.492	-0.1522	**-0.4134**	-0.034	-0.143	-0.0434	-0.0642	0.00292	-0.1519	-0.013
Tomato	-0.0181	-0.045	0.00886	0.06143	**-0.483**	-0.073	-0.0172	-0.0953	0.01528	-0.0638	-0.01
Karela	-0.0093	-0.02	0.0119	-0.0502	-0.003	**-0.538**	0.0367	0.01331	0.02759	0.00898	0.0166
Gram	-0.0158	-0.008	-0.012	0.01111	0.035	0.0171	**-0.236**	-0.0069	-0.0492	-0.0121	0.0027
Dacha	-0.0196	0.0057	-0.0018	-0.0008	-0.01	-0.076	-0.0035	**-0.5242**	-0.0619	-0.0379	-0.014
Mash	0.03122	0.0599	0.00854	0.00275	0.0232	-0.084	0.0098	-0.0278	**-0.4507**	-0.0099	0.0154
Masoor	0.01703	-0.012	-0.0012	-0.0206	0.0148	0.0013	-0.0277	-0.05	-0.0544	**-0.322**	-0.009
Bghee	0.0457	0.0129	0.03002	0.00581	0.0184	0.0483	-0.004	0.02813	0.0368	-0.0083	**-0.783**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Table 25: Compensated own and cross price elasticities of food products: Rural Balochistan (2005-06)

	Demand for							
Price of	**Wheat**	**Rice**	**Otcereal**	**Dalcha**	**Mash**	**Moong**	**Masoor**	**Bghee**
Wheat	**-0.4311**	0.3308	-0.2954	0.17437	0.2437	0.2142	0.0567	0.06688
Rice	-0.0594	**-0.623**	0.19388	-0.0707	-0.027	-0.079	-0.0559	0.02285
Otcereal	0.01225	0.1339	**-11.288**	0.02209	0.007	0.0229	0.0038	0.00675
Dalcha	-0.017	0.0103	-0.0779	**-0.5318**	-0.064	-0.048	-0.0479	-0.0186
Mash	0.02164	-0.154	0.12367	-0.0324	**-0.449**	-0.027	-0.0172	0.01381
Moong	0.01107	-0.002	0.15351	-0.076	-0.087	**-0.561**	-0.0372	-0.0053
Masoor	-0.008	-0.064	-0.0694	-0.0502	-0.052	-0.025	**-0.3216**	-0.0104
Bghee	0.03252	0.0121	0.06772	0.03171	0.0363	0.0181	-0.0052	**-0.7784**

Source: Computed by authors based on HIES data of Pakistan for the year 2005-06.

Conclusions and Policy Implications

This study attempts to estimate and report households consumption and demand elasticities in detail. This is one of the first studies in developing countries particularly in Pakistan to take into account adult equivalent scales in households' consumption patterns. The study is based upon household data related to Household Integrated Expenditure Survey (HIES) for the year 2005-06. The cross sectional data especially in their disaggregated form are far richer than time series data. The cross sectional survey, by definition, collect data from households. The households have different income or total expenditure and demographic information. The important contribution of this study is that it covers the least developed province of Pakistan that is Balochistan and both its urban and rural regions. The study has constructed adult equivalent scale at first stage. The SPSS package has been used in order to arrange the data. The significance of adult equivalent scales are supported by the estimated Engel Curve of food items particularly. The graphical representations have been obtained in the case of consumption-expenditure relationships. The consumption-expenditure relationships show that per adult equivalent households food consumption is increasing at a decreasing rate. According to the findings of the current study, all food items are treated as necessities except vegetable ghee in the case of urban and rural Balochistan. It is treated as luxury. The estimated food items demand elasticities with respect to price and expenditure may be used by

government policy makers of Balochistan, WFP (World Food Programme) and other local and international NGOs for household food programs. The province of Balochistan is the most poorly-developed and a food-insecure region in Pakistan. All socio-economic indices like literacy, health, and unemployment are below national averages. The expenditure elasticities of food items suggest that the nutritional requirements will get improved with the easy availability of food items. It can be done through the food support programs like food program of WFP and Benazir Income Support Program. The policy makers can get further assistance from the findings of this study while targeting households' decisions.

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