

Estimating the Poverty Line and Living Conditions of Rural Households: A Case Study

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Abstract Poverty has always been studied in a world of certainty. However, if the aim of studying poverty is not only improving the well-being of households who are currently poor, but also preventing people from becoming poor in the future, a new forward looking perspective must be adopted. For thinking about appropriate forward-looking anti-poverty interventions (i.e. interventions that aim to prevent or reduce future poverty rather than alleviate current poverty), the critical need then is to go beyond a cataloging of who is currently poor and who is not, to an assessment of households' vulnerability to poverty. In this paper, the cost and income of rural households in Khuzestan province have been reviewed and analyzed. Subjective poverty line in terms of behavioral observation were estimated by estimating linear expenditure system (LES) based utility function Stone - Gray and using household budget data (1991-2003) for rural area in Khuzestan province. The product portfolio that were estimated for the minimum wage (poverty line) including food, clothing, housing and health. According to the estimates, the minimum required expenditure for a rural household in Khuzestan province with average household size 9/6 persons in 1991 to 339,182 RIs, and in 1996 was 21,407,484 RIs that in 2009 was equivalent to 4,415,051 RIs.

Keywords: *poverty, rural households, poverty line, linear expenditure system*

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1. Introduction

Poverty is as a phenomenon that relatively exists in all human societies. The phenomenon of the past and present in different schools is as areas of underdevelopment and corruption, poverty is a clear indication of the economic and social underdevelopment, poverty and health are clearly puts the community at risk. Islam has a strong emphasis on poverty reduction.

Poverty reduction programs are often one of the economic priorities of different countries, including Iran. Hence, the calculation of poverty and the poverty line for urban and rural households measure the poverty gap, calculate the amount of contribution or subsidy, poor identification and evaluation of poverty reduction policies and measures that are necessary to make the foregoing purposes.

One way to understand the living conditions of households, in terms of consumer behavior is in consumer theory. Studies to explain consumer behavior and ability of consumer spending measuring due to price changes can appearance in the whole country or in different geographic areas or to validate such characteristics of socio - economic study by individuals or communities. Throughout, the population was divided into geographical

division of the authenticity of the results can be more specific regarding the welfare of the inhabitants of that region.

In this paper tried to review and analyze based on the last statistical data of household economic status, household income and expenditure of rural households in Khuzestan province, in the face of poverty in the particular geographic and demographic features. This article is written in five parts. The second part, a review of empirical studies conducted in the fields of fashion and household expenditure and poverty in the world and in the linear expenditure system. The third section is a brief review of research. The fourth section deals with the present experimental results and analysis. The fifth section is devoted to summary and conclusions.

2. Literature Review

According to Christiansen and Subbarao [5], understanding vulnerability in any human development strategy in conjunction with. Poverty is crucial, firstly, because vulnerability is an intrinsic aspect of well-being. In evaluating household's well-being, one must not be limited to the household's actual welfare status today, but must also account for the household's prospects for being well in the future, and being well today does not imply

being well tomorrow [11] and [4]. Secondly, understanding vulnerability is also important from an instrumental perspective.

Because of the many risks household face, they often experience shocks leading to a wide variability in their endowment and income [5].

According to Holzmann and Jorgensen [8], a high percentage of households move into Poverty due to temporary shocks (such as illness or loss of employment) that are reversed just one or two years later. Similarly, many of the people who escape poverty or who are not vulnerable now only succeed in doing so or being so for one or two years before a reverse in their circumstances pushes them back below poverty line which makes them vulnerable. The concept of vulnerability therefore, is dynamic and is broadly an ex-ante or forward looking measure of a household's well being or (lack thereof). The term has been used in a variety of related but different meanings. Chambers [3] defined vulnerability as the exposure to contingencies and stress which is defenseless, meaning a lack of means to cope without damaging loss. The World Development Report 2000/01, defined vulnerability as a likelihood that a shock will result in a decline in well-being. To date, no acceptable definition of, or measurement methodology for vulnerability to poverty has been agreed on. However, as demonstrated in Zhang and Wan [17], most researchers prefer to define vulnerability as the probability of a household or individual falling into poverty in future, i.e. the danger that a socially unacceptable level of wellbeing may materialize in future. This definition is followed in this study.

One of the researches done on poverty is household needs anticipated in Sistan and Bluchestan province by Ali Akbar Khosravi [9]. In this study, using a linear expenditure, the poverty line for rural and urban households is estimated during the period 1983-1996. In addition, consumer spending, the main commodity groups (food, clothing, housing and other goods) is predicted for the years 1998-2006. Elias Naderan. and Saieed. Gholami and Nataj Amiri [13] explored a research on the living conditions of urban poverty in Mazandaran province amidst dark green leaves. In this study, the social and economic characteristics of urban households in Mazandaran province have been analyzed with respect to changes in population characteristics, income, and consumption combined, the percentage of households benefiting from the convenience of living and changes in income distribution for the period of 1990-1996. The results of the poverty line as a linear expenditure system approach based on utility function stone - Gary is estimated, showed that household food basket is the largest. Mahmoud Motevaseli and Saeed Samadi [12] have also studied the economic aspects of poverty reduction policies. This study aims to assess the severity and extent of poverty in the community and opportunities for poverty reduction using data from the Household Budget urban 1982-1997. Office of Economic Parliament has also considered to the household consumption model based on consumer demand during 1955-1993. In this study, used the linear expenditure system, the minimum wage, urban consumer's price, and income capability of commodity groups are calculated on the economy.

3. Methodology

One of the major tools in determining the extent of poverty is specifying the poverty line that separates the poor from the non-poor. There are two basic methods for determining the poverty line, the use of different criteria (material) and the definition of life was minimal. Combining these two techniques can also be used. In minimum income method, hypothetical basket of goods and services considered being essential for sustaining life and the money to buy this pool is specified as the minimum income. In this paper, to extract a minimum income used household consumption data and linear expenditure system method. In this way, the demand function of households and the poverty line is obtained using the estimated parameters. In general, demand function can be estimated in two-system single-equation and systematic. It is estimated that the demand functions are consistent with the theory of consumer behavior, must impose constraints on these functions, and these constraints can be noted as Engel constraint, homogeneity constraint and symmetry constraint. Clearly, the demand equation is expressed as a single equation cannot mention all the constraints, while the demand equations are specified as a system of demand equations governing the allocation of expenses between all constraints are of the goods, The simultaneous demand for each commodity with the price of goods is related to other goods and customer income. Hence, in many cases demand equation system can analyze consumer behavior better. System of demand equations involving n demand equations, as will be shown below.

$$q_i = q_i(p_1, p_2, \dots, p_n, I) \quad i = 1, 2, \dots, n \quad (3.1)$$

In this regard, the budget constraint represents a complete system of demand equations for such a system in the amounts consumed goods (q_i) endogenous variables as a function of the prices of all goods (p_i) and income variable (I).

The system can be generally divided into two groups divided by the demand equation:

A - Systems cannot be related to a certain utility function.

B - Systems that can be related to a specific utility function.

The first group, constraints that are appropriate to test the constraints imposed on the parameters that can limit the application of theory to the test. However, the second group is designed to provide some or all the restrictions of demand theory. There are different ways to represent a system of household demand in the economic literature. These methods include the Almost Ideal Demand System (AIDS) provided by Deaton, A. and J. Muellbauer. (1980), the Rotodrom model provided by Tile and Barton (1995) linear expenditure system provided by Stoon (1954).

Four reasons can be cited for employing a linear expenditure system: First, the interpretation of the parameters of this system is very simple. Secondly, this system is a system which itself makes one of the few limitations of demand theory. Thirdly, the equations are linearly for the variables of price and income. Although the linear expenditure system limitations and supplements its own price capability of the goods does not, however, be considered when whole groups of commodities, this

system can provide a good approximation of reality. Fourthly, fewer parameters are estimated. In other words, if we apply the system of equations used for n goods, only have (1-2n) parameters (minus one for the sum of β is equal to one.) Estimate and the equations for n goods typically have n² + 2 n parameters that n² parameters for price, n parameters for income and n parameters remaining constant is needed, for example, the four items of interest and four single equation is used to estimate the 24 parameters in equation 4. However, using linear expenditure system parameter estimation is only 7 instead of 24 parameters, which makes a major contribution to enhancing the degree of freedom. Linear system derived from a utility function is usually assumed for this purpose, the utility Stone - Grey consider the following:

$$U = \sum_{i=1}^n \beta_i \log(q_i - \gamma_i) \quad i = 1, 2, \dots, n \quad (3.2)$$

$$0 < \beta_i < 1, \sum_{i=1}^n \beta_i = 1, (q_i - \gamma_i) > 0 \quad (3.3)$$

Where U represents the utility index, γ_i is the minimum wage or less consumption of ith goods and β_i shows expenditure share of commodity. Bet $\sum_{i=1}^n \beta_i = 1$ in equation (2) to supply the necessary curvature of the indifference curve that ensure strictly quasi-concave utility function. Maximized remembered utility function with respect to budget constraints $\sum_{i=1}^n p_i q_i = m_t$ are obtained following demand functions.

$$q_i = \gamma_i + \frac{\beta_i}{p_i} (m_t - \sum_{k=1}^n \gamma_k p_k) \quad k = 1, 2, \dots, n \quad (3.4)$$

Where m_t represents the total variable costs. The system of equations (4) indicates that the demand for good i have a function as a function of the price of the goods in the price of other goods and income.

The $m_t - \sum_{k=1}^n \gamma_k p_k$ was called upon strictly Quasi-concave the amount of which provide minimum living expenses. If both sides of the system (4) multiple to p_i , we will have:

$$p_i q_i = p_i \gamma_i + \beta_i (m_t - \sum_{k=1}^n p_k \gamma_k) \quad k = 1, 2, \dots, n \quad (3.5)$$

Equation (5) provides a system of equations, system of equations in which the expenditure on commodity ith, is a function of all prices and income variables. In equation (5) symbol β_i , as noted above, the share of spending, and that the income (expenses) - for example RLS cent increase expenditure on commodity i am after deducting expenses for at least a few rial will increase. β_i called the marginal propensity to consume was associated with living beyond as they say γ_i coefficient represents the minimum salary required to consumer goods, or at least ith have is that consumer spending is spent for this product.

The estimated model as the linear cost system is

$$p_{it} q_{it} = p_i \gamma_{it} + \beta_i (m_t - \sum_{k=1}^n p_k \gamma_k) \quad (3.6)$$

And $\beta_i \gamma_i$ the parameters simultaneously, using a grid of possible values are estimates. Three squares methods

(3sls), with full information maximum likelihood (FIML) and seemingly unrelated equations (NSUR) is one of these.

In this study to estimate the system of nonlinear equations (7) through (NSUR) used by software Eviews.4. But the main point is that when estimating the system must arrange the covariance matrix Σ can be reversed completely linear estimation problem is not encountered. If we add together the above system of equations, then we have:

$$\varepsilon_{1t} + \varepsilon_{2t} + \varepsilon_{3t} + \varepsilon_{4t} = 0 \quad (3.7)$$

Since $\sum_{i=1}^4 \beta_i = 1$, therefore, the matrix Σ is singular and cannot be reversed, the solution to this problem is simple enough that one of the equations (i.e. equation IV) remove the remaining equations are estimated, then according to $\sum_{i=1}^4 \beta_i = 1$ limits the estimated parameters to obtain 4β (Abrishami, p.56).

In addition to the initial values for parameter estimation should be considered γ_i and β_i . The starting point for the least amount q_{it} during the study period, and the average share of expenditure $\frac{1}{T} \sum \frac{p_{it} q_{it}}{M_t} \gamma_i$ and β_i are used as initial values. (Resort Samadi p. 93).

Minimum consumption basket of commodities, in Khuzestan province, according to the statistics letter of 1996, so we have:

$$\beta_1, \gamma_1 = 0/047 \quad \beta_2, \gamma_2 = 0/014 \quad \beta_3, \gamma_3 = 0/013 \quad \gamma_4 = 0/004 \quad (3.8)$$

3 - Income and price elasticities in the linear expenditure system

To obtain the formula of income elasticities of demand equation must be linear expenditure system

$q_i = \gamma_i + \frac{\beta_i}{p_i} (m_t - \sum_{k=1}^n \gamma_k p_k)$ than we were then derived m_t in this case, we're stretching the formula to get the following formula:

$$\eta_i = \beta_i \frac{m_t}{p_i q_i} \quad (3.9)$$

Since β_i and $p_i q_i m_t$ and they are all positive, so the income elasticity is positive, i.e. $0 < \eta_i$. (Quant, p 39). If the formula stretching precious insider for linear expenditures system to get a first order equation $p_i q_i = p_i \gamma_i + \beta_i (m_t - \sum_{k=1}^n p_k \gamma_k)$ of p_i derived, the formula price elasticity itself put after arranging to get the following equation:

$$E_{ii} = (1 - \beta_i) \frac{p_i \gamma_i}{p_i q_i} - 1 \quad (3.10)$$

In equation (10) is positive if γ_i paving own price elasticity is less than one. Cross-price elasticity formula can also be derived from the equation

$q_i = \gamma_i + \frac{\beta_i}{p_i} (m_t - \sum_{k=1}^n \gamma_k p_k)$ rate than those in p_k / q_i - to achieve so:

$$\frac{\partial q_i}{\partial p_k} = -\frac{\beta_i \gamma_k}{p_i} \quad \& \quad E_{ii} = \frac{\beta_i \gamma_k p_k}{p_i q_i} \quad (3.11)$$

Equation (11) in the cross-price elasticity formula is linear expenditure system, so that the effect of a percentage change in price K th on the amount of consumption goods has i th suggesting (Quant, p 38).

4. Results

After the fourth removal of equation system (7) and the initial starting point for the demand parameters are estimated from the first three groups NSUR way.

$$\begin{aligned} E_1 &= p_{1t} q_{1t} = p_{1t} \gamma_1 + \beta_1 (m_t - p_{1t} \gamma_1 - p_{2t} \gamma_2 - p_{3t} \gamma_3 - \beta_4 \gamma_4) \\ E_2 &= p_{2t} q_{2t} = p_{2t} \gamma_2 + \beta_2 (m_t - p_{1t} \gamma_1 - p_{2t} \gamma_2 - p_{3t} \gamma_3 - \beta_4 \gamma_4) \\ E_3 &= p_{3t} q_{3t} = p_{3t} \gamma_3 + \beta_3 (m_t - p_{1t} \gamma_1 - p_{2t} \gamma_2 - p_{3t} \gamma_3 - \beta_4 \gamma_4) \\ E_4 &= p_{4t} q_{4t} = p_{4t} \gamma_4 + \beta_4 (m_t - p_{1t} \gamma_1 - p_{2t} \gamma_2 - p_{3t} \gamma_3 - \beta_4 \gamma_4) \end{aligned} \quad (4.1)$$

According to estimates, the coefficient of determination adjusted $99/0 = R^2$ shows that 99 percent of changes in cost of goods i th by the index of prices of a basket of commodity consumption (food, shelter, clothing, health) and spending the entire mt can be explained by the analyze power is very high. T statistics estimated coefficients indicate significance at the 95% confidence coefficient. However, the data used in this study are not expected to impact the income of a household's spending, household spending will affect others, but the statistics earlier estimates of the existence of Dorbin Watson between sentences disrupting the model. Hence, the autocorrelation of a process to meet its first description (1) AR was added to the system.

Table 1. Estimated parameters of the model for rural province 1991-2009

Hygiene and health	Clothes and shoes	Housing, fuel and utilities	Food and beverage and tobacco	Parameters
0/070 -	0/130 (14/432)	0/214 (14/806)	0/586 (90/052)	β_i (statistic t)
392 (2/394)	1485 (2/571)	3006 (3/098)	6270 (2/832)	γ_i (statistic t)

According to given the constraints $\sum_{i=1}^4 \beta_i = 1$ β_4 value can be achieved:

$$0/586 + 0/214 + \beta_4 = 1 \quad \beta_4 = 0/07$$

Price capability of expenditure β_i implies that if spending beyond subsistence rural families an average of 100 riyals to increase the amount of 6/58 riyal spent on food and beverages, 4/21 riyal spent on housing, 13 rials spent apparel and 7 rials will be spent on healthcare. In other words, (80 = 4/21 + 6 / 58) percent of rural families living in the province were trained to feed and clothe the most essential needs of life, and only 20 percent is allocated for other purposes remains.

Table 2. Poverty line in the rural area of Khuzestan province

Annual poverty line (RLS)	Monthly poverty line (RLS)	Year
339182/2	282665/183	1991
397291/58	33107/631	1992
513306/88	42775/573	1993
769494/92	64124/576	1994
1112600	927716/666	1995
2140748/4	178395/7	1996
1704993/3	142082/8	1997
2213306/2	184442/18	1998
2754916/9	229576/4	1999
2781367/4	2311780/61	2000
3917481/8	326456/81	2001
4756193/2	396349/43	2002
4415051/4	367920/95	2003
17763569	1480297	2004
20215717	1684643	2005
22706560	1892213	2006
26943684	2245307	2007
33775086	2814590	2008
44164773	3680398	2009

Source: Estimation Results

In Table 2 the poverty line, the minimum income required to meet the needs of rural households living in Khuzestan between the years 1991-2009 in 1995 constant prices are presented annually and monthly. The estimated minimum spending requirement - the subjective poverty line in a rural household in Khuzestan province in 1991 was at an annual average of 339,182 Rls and 28,265 Rls a month. In 2009 the figure rose to 44,164,773 Rls a month to 3,680,398 Rls. According to the share of households earn less than the average total household consumption expenditure in the two years from 17.7 percent to 61 percent increase, the inflationary pressures of increasing the level of living of households, despite adjustment households forced to pattern themselves have imposed a minimum cost to live in a rural community in Khuzestan increased from 28,265 Rials per month in 1991 to 3,680,398 Rls . A minimum subsistence groups share food, shoes and clothing, household income of at least demonstrating that the parasite index of household portfolio composition is, on average, the study shows that more than 83 percent of the province of minimum wage expenditures basket the group is dedicated to food and clothing. This shows the importance and high priority to the basic needs of life is less than 20 percent of total household subsistence expenses will be allocated to other commodity groups. Values estimated marginal propensity to pay strictly Quasi-concave costs (β_i) suggests that any increase in the income of rural households increased income beyond subsistence Khuzestan which will have the greatest impact in the first place the cost of food. In this context, the cost of food, clothing and health care are secondary priorities.

Table 3 presented the cost of strictly Quasi-concave for households in rural areas of Khuzestan province during 1991-2009. It is estimated that the demand function, the expenses have to be spent on commodity ith, is split into two components: First, the minimum and necessary expenses that must be spent for goods (i.e. $p_i \gamma_i$) and other expenses that represent expenses that are living beyond their authority on the i th consumer goods.

Table 3. Spending Ultra livelihood expense in Khuzestan province

Total expenses (RLS)	Minimum salary (RLS)	strictly Quasi-concave expenses (RLS)	Year
1917170	339182/2	1577987/8	1991
2716841	397291/58	2319549/5	1992
3391506	513306/88	2878199/2	1993
3444933	769494/92	2675438/1	1994
6885662	1112600	5773062	1995
7667516	2140748/4	5526767/6	1996
8666600	1704993/6	6961606/4	1997
10161871	2213306/2	7948565	1998
11062218	2754916/9	8311302	1999
13526616	2781367/4	10745249	2000
14886617	3917481/8	1096136	2001
18683495	4756193/2	13927302	2002
21259289	4415051/4	1684238	2003
35366689	17763569	17603120	2004
39574870	20215717	19359153	2005
45021919	22706560	22315359	2006
53075732	26943684	26132048	2007
67574290	33775086	33799204	2008
71989373	44164773	27824600	2009

Source: Estimation Results

Considering the results presented in Table 3, upon the income of rural households living in Khuzestan, has been growing each year during the studied period, the trend shows that the rural consumer spending Khuzestan during the movie as mere commodities 1991-2003 is different and has grown significantly. The relative improvement of the welfare of rural households defined basket of goods according to the story. This result is not in any way mean that this group of consumers is in good condition.

Notes to Table 3 came to a steep drop in Khuzestan strictly Quasi-concave rural families in 2001 and 116

percent growth over the past two consecutive years noted 1994 and 1995.

4.1. Estimated Price and Income Elasticities

Using estimates of the share of expenditure (β_i) and related $\eta_i = \beta_i \frac{m_t}{p_i q_i}$, income capability for a basket of goods has been calculated in Table 4.

Table 4. Estimation of income elasticities (total expenditure) Commodity groups living in the rural household of Khuzestan province

Hygiene and health	Clothes and shoes	Housing, fuel and utilities	Food and beverage	Goods group
1/11	0/99	0/97	1/04	Income capability
628312	1321965	2057210	5552169	Average annual expenditure (RLS)

Source: Estimation Results

Income elasticities in Table 4 based on the average expenditure on each item and the total average costs are calculated in 1991-2003.

If strictly Quasi-concave income increases by 10% for a rural household stretch who can say that the demand for feed increases 4/10 percent, to accommodate 7/9 per cent, to clothing 9/9 percent for health 1/11 respectively. Increase rural incomes above the demand for housing, food, and next time it rises. Because of the high share of consumer spending on food and clothing to the total cost of goods considered, because the study was on average 80% of the household expenditure spent on food, clothing is a rural household in Khuzestan province. If we assume 10% of the rural livelihood extra income decreases, the maximum damage inflicted on the consumer group food and clothing. Using the estimated share of the costs of trans-living (β_i) and estimates the minimum spending requirement (γ_i s), price elasticities own cross and calculated (Table 5) was the calculation of price elasticities and cross respectively the

$$E_{ii} = (1 - \beta_i) \frac{p_i \gamma_i}{p_i q_i} - 1 \text{ and } E_{ik} = - \frac{\beta_i \gamma_k p_k}{p_i q_i} \text{ is used.}$$

Table 5. Own and cross-price elasticities for different commodity groups, rural household of Khuzestan province 1991-2009

Hygiene and health	Clothes and shoes	Housing, fuel and utilities	Food and beverage	Goods group
-0/07	-0/11	-0/39	-0/57	Food and beverage
-0/06	-0/09	-0/48	-0/56	Housing, fuel and utilities
-0/06	-0/45	-0/32	-0/54	Clothes and shoes
-0/06	-0/12	-0/43	-0/070	Hygiene and health

Source: Estimation Results

Own and cross-price capability in Table 5 based on average minimum salary and average expenditure on each commodity is calculated. Goods of the lowest own price elasticity belonging to the maximum Product Group Health and food is a commodity groups. The food price index increased by 10%, demand for housing, 9/3% and Health 7/0 percent decline.

Appendix

Estimated minimum expenditure necessary in rural households of Khuzestan province

Foods	Housing	Clothes	Health	Year
185216	108396	35954	9616	1991
213055	129138	38927	16127	1992
375113	170711	47210	20070	1993
452067	206783	77843	3203	1994
627000	300600	145800	39200	1995
758983	407914	186842	55056	1996
890967	515228	227885	70913	1997
6201332	655909	273667	82398	1998
1535523	765787	318464	135152	1999
1549819	812221	320614	98713	2000
2225223	1037070	428652	226537	2001
2741224	1248091	489596	227262	2002
2320527	12877704	490763	315991	2003
6408252	2100360	2377021	2223629	2004
7220092	2337454	2670078	2541740	2005
8569956	2482122	2823310	2910875	2006
10784502	2845130	3158507	3385207	2007
14243229	3506851	3687159	4168832	2008
21328815	4109633	4336482	5005370	2009

Source: Estimation Results

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