SURVEY OF POVERTY LINE- VULNERABILITY OF RURAL HOUSEHOLDS AND THE DETERMINING FACTORS IN THE PROVINCE OF SOUTHERN KHORASAN, IRAN

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ABSTRACT: The purpose of the present study was to Survey of poverty line and vulnerability of the rural households in the Province of Southern Khorasan. The study sample included the data of the income of rural households in the Province of Southern Khorasan which was collected by the Statistics Centre of Iran from 2010 to 2012. Poverty line was estimated based on the costs of a household and the recommended model by the Institute of Nutrition, and the households were divided into poor and non-poor households. The indicators of vulnerability namely the proportion of the vulnerable people, vulnerability gap, and intensity of vulnerability were estimated also. Finally, using statistics, the factors determining poverty and the vulnerability of the sample of the study were examined. The results demonstrated that poverty line and indicators of vulnerability in the studied area were of a larger scale in 2011. And Gender, literacy, employment of the head of the household were the most determining factors.
Key Words: Vulnerability, Poverty, rural households, of Southern Khorasan, Iran

INTRODUCTION

The scientific use of 'vulnerability' has its roots in geography and natural hazards research but this term is now a central concept in a variety of other research contexts such as ecology, public health, poverty and development, secure livelihoods and famine, sustainability science, land change, and climate impacts and adaptation [8]., and is a basic tool for the analysis of environmental problems [2], [8], [9], [17], [18], [19], [20]. United Nations (2004) distinguish four groups of vulnerability factors that are relevant in the context of disaster reduction: physical factors, which describe the exposure of vulnerable elements within a region; economic factors, which describe the economic resources of individuals, populations groups, and communities; social factors, which describe non-economic factors that determine the well-being of individuals, population groups, and communities, such as the level of education, security, access to basic human rights, and good governance; and environmental factors, which describe the state of the environment within a region. All of these factors describe properties of the vulnerable system or community rather than of the external stressors. The conceptualization of vulnerability varies significantly across research domains, and it has evolved over time. For instance, the theoretical evolution of hazards research is generally characterized by the following stages: (1) pure determinism, assuming that nature causes hazards; (2) a mechanistic engineering approach, emphasizing that technology can be used to reduce vulnerability and losses; (3) the human ecology approach, arguing that human behavior and perceptions were important; and (4) the political economy approach, arguing that structure not nature, technology, or agency creates vulnerability[11].

The political economy approach focuses the analysis on people, asking who is most vulnerable, and why. In this tradition, Adger and Kelly (1999) define vulnerability as ''the state of individuals, groups or communities in terms of their ability to cope with and adapt to any external stress placed on their livelihoods and well-being'. Essentially, vulnerability of livelihoods to shocks occurs when people have insufficient real income and wealth, and when there is a breakdown in other previously held endowments [2].

Iran like any developing country is faced with poverty and its large scale in rural societies [5], [10], [12], [16], [22]. In this country, rural households compared to urban households go through more unpleasant situations and they suffer more intense poverty and injustice [1], [15]. Macro-studies of poverty in rural areas in Iran have mainly been general, and they have failed to offer precise, purposeful, and effective strategies and policies as they were unable to define certain indicators which could only be achieved by micro-studies [16], [22]. When natural disasters like drought strike, the problem deteriorates. At the moment, drought, shortage of water and its results on agricultural production and economical development are considered a main concern. Drought decreases the amount of agricultural production and this, consequently, increases the prices of agricultural and live-stock products. It increases demands for low-interest loans, unemployment, and income. It increases the costs of water supply, and decreases food production, and as a result, it increases food import. Decreasing food production happens when the scale of cultivated land decreases. The province of Southern Khorasan which has a dry and semi-arid climate has suffered more severe drought in recent years. This has decreased the income of the rural households, made their living conditions more undesirable, and extended poverty among rural households. In this regard, this study focused on examining the vulnerability of the rural households in the province of Southern Khorasan as a case study.

METHODOLOGY
Measuring absolute Poverty line
Alleviating poverty is one of the Millennium Development Goal (MDG) classified poverty into absolute, relative, chronic, transitory and spatial [14]. In many studies have been done to identify poverty, poverty line, and its intensity, three methods namely, income, basic standards, costs of the household has been used. Since it is not possible to obtain exact information about the income of the households from the statistics centers in Iran, this method is not applied here. The method of basic standards suffers some disadvantages too as it is difficult to determine certain standards to cover all the needs of the household. Due to different preferences and expectations in the consumption pattern of the household, there is doubt how precise it could be. Therefore, the most appropriate method of measuring poverty in Iran is to exam the costs of the household. In this method, the relationship between poverty and the income of the household is analyzed based on the costs of the household. This could be the total costs of the household or the costs of a set of selected basic goods. In the latter way, a set of basic goods which is essential to satisfy basic needs and to continue life is selected, and then income to purchase them according to the prices at the time is measured.

If the basic food products are considered X, and their prices are considered Px, and the other basic products are considered Y, and their prices are Py, then poverty line is as follows:

$$P_X X + P_Y Y = M \tag{1}$$

To make M more real, it is multiplied by a coefficient like θ to consider the wasted cost. This coefficient is always larger than unity.

To apply this method, first, the costs of minimal amount of necessary food are measured. An appropriate diet provides enough energy, and consists of all food groups. Iran Institute of Nutrition recommends a model which is used in this study (table 1). This model supplies 2250 calories per day. Obviously, it has to come from different food groups like cereals, beans, meat, sugar, oil, dairy products, fruit and vegetables. The share of each food group is determined by the nutritionists.

If the necessary food is considered X, and the measured price is Px, then the minimal food costs which is the poverty line could be measured by the following formula.

Food poverty line $= X.P_x \tag{2}$

A) The first approach
IN this approach, which was proposed by Azimi (1370), the costs of other goods are considered to be equal to half of the minimal costs of necessary food for an individual. Therefore, total poverty line is as follows:

Total poverty line= food poverty line+$\frac{1}{2}$ food poverty line $\tag{3}$

Table 1- The model recommended by Iran Institute of Nutrition (appropriate nutrition)

Required food	Gr/day	Cal/day	Kg/yr.
Cereal	350	-	-
1. bread	250	900	90
2. rice	100	360	36
Beans	30	105	10.8
Sugar	45	108	16.2
Oil	25	225	9
Meat	100		
1. beef	30	—	10.8
2. white meat	25	—	9
3. fish	20	120	7.2
4. eggs	25	—	9
Dairy products	220		
1. milk	100	60	36
2. yoghurt	100	60	36
3. cheese	20	46	7.2
Vegetables	320	109	115
Fruit	350	94	126

There are three approaches which are mostly applied to obtain total poverty line.

B) The Second approach

Since it seems that in developing countries, the biggest share of income is spent on food, therefore, it is suggested that total poverty line be measured as foolows:

Total poverty line= food poverty line + $\frac{1}{3}$ poverty line   (4)

C) The third approach or Urjanski method

In this approach, to measure the costs of other goods, the ratio of the average of total cost to the average of food costs is used.

Total poverty line= food poverty line X (the average of total cost (food and other)/ the average of food costs (5)

Measuring the vulnerability of Rural Households' livelihood

After measuring poverty line and determining poverty threshold, there is a need for an indicator to measure vulnerability. Some of the indicators are measured as follows:

A vulnerability measure focused on human well-being therefore incorporates material aspects and outcomes of vulnerability. If the outcomes of vulnerability were exclusively economic and could be measured in income terms then a measure of vulnerability could collapse to a measure of relative poverty. But the entitlements theory of Sen (1981) and contributions to risk and vulnerability analysis [13] [5]. Have argued that vulnerability is not the same as poverty. Therefore a vulnerability measure needs to incorporate well-being defined broadly.

A generalized measure of vulnerability that satisfies all of the criteria set out above, should therefore be able to identify the proportion of the population that are vulnerable, be sensitive to distribution of vulnerability within the population and to the severity of the vulnerability (distance from threshold). The 'population' in this case refers to the systems over which vulnerability is measured and could be a population of communities, individuals or ecosystems.

Such a set of indicators (Va) would be defined (based on the Foster et al. (1984) generalized poverty measures) as follows:

(6)

$$V_a = \frac{1}{n}\left[\sum_{i=1}^{q} \left(W_0 - W_i / W_0 \right)^a \right]$$

where Va is the vulnerability indicator, Wi the well-being of individual i; W0 the threshold level of well-being representing danger or vulnerability; n the total number of individuals (whether households, farms, settlements or whatever); q the number of individuals above the vulnerability.

Threshold; a sensitivity parameter and individuals are ordered from bottom to top (W1 is more vulnerable than W2 and so on).

Proportional Vulnerability

The proportion of the relevant population (individual components of a system) that are classed as vulnerable. This is a 'headcount' indicator. This does not account for the degree of vulnerability of the individual [2].

$$V_0 = \frac{q}{n} \tag{7}$$

Vulnerability gap

The aggregate scope of vulnerability measured in well-being terms: the summed distance of well-being for each individual from the vulnerability threshold level of well-being. Action to reduce vulnerability could focus either on reducing the number of individuals that cross the threshold or the scale of their vulnerability [2].

$$V_1 = \frac{1}{n}\left[\sum_{i=1}^{q} \left(W_0 - W_i / W_0 \right)^1 \right] \tag{8}$$

Vulnerability severity

The severity of vulnerability is measured by weighting the distribution of the vulnerability gap within the vulnerable population. The greater the vulnerability is skewed towards the most vulnerable, the greater the severity [2].

$$V_2 = \frac{1}{n}\left[\sum_{i=1}^{q} \left(W_0 - W_i / W_0 \right)^2 \right] \tag{9}$$

RESULTS AND DISCUSSION
A- Descriptive statistics
Absolute food poverty line and Monthlypoverty line

The results demonstrated that poverty line in Southern Khorasan increased over the years studied (table 2). The absolute food poverty line rose up from 2053886 Rials to 3447578, and the total Monthly poverty line measured in the three different approaches rose up from 3199524 Rials in 2010 to 4827861 Rials in 2012.

Table 2- Poverty line in rural areas in Southern Khorasan (capitation, monthly, Rial)

Year	The Monthly absolute poverty line	Monthly total absolute poverty line			Average
		First approach	Second approach	Third approach (Urjanski Method)	
2010	2053886	3580829	2738514	3279227	3199524
2011	2449291	4805474	4462303	3426059	4231279
2012	3447578	5171367	4596770	4715446	4827861

The results shown in table 3 demonstrated that the lowest level of vulnerability or the percentage of the vulnerable people in rural areas of Southern Khorasan in the studied years belonged to 2010which is 28.2 percent, and the highest percentage belonged to 2012 equal to 46.5 percent. This means that 46.5 percent of people were vulnerable in rural areas of Southern Khorasan in 2011. The results also showed that the widest gap of vulnerability belonged to 2012 which is 0.19, and the lowest belonged to 2010 which is 0.04. The results of the intensity of vulnerability demonstrated that the highest intensity (0.10) and the lowest (0.02) belonged to 2012 and 2010 respectively.

Table 3- The indicators of vulnerability in rural areas in Southern Khorasan

Year / Vulnerability	2010	2011	2012
Proportional vulnerability	28/4	46/9	28/2
Vulnerability gap	0.040	0.19	0.12
Vulnerability severity	0.02	0.10	0.06

The results of the study of socio-economical and demographic characteristics of the rural households in Southern Khorasan, shown in table 4, are as follow:

The study of the age of the warden of households in different deciles demonstrated that the highest average of age belonged to 10-cost decile, and the lowest belonged to one-cost decile.70.5 percent of the households of decile 10 had female heads of the household, only 1.6 percent of the wardens of this decile were literate, and 8.2 percent were employed leaving 91.8 unemployed. The results also demonstrated that the highest average belonged to decile 1 that is 4.93 people, and the lowest belonged to decile 10 that is 4.78. The results also showed that the households of decile 1 had the highest average number of rooms that is 4 rooms, and the households of decile 10 had the highest average number of rooms that is 2.45 rooms. The infrastructure of the homes of people in different deciles varied from 97.09 to 54.83 square meters. The highest belonged to decile 1 and the lowest to decile 10. The results of the study of car ownership demonstrated that 67.7, 46.8, 51.6, 10 percent of deciles 1,2,3,5 respectively owned cars. Only 3.2 and 1.6 percent of the households of decile 6 and 7 owned cars. The households in decile 4, 8, 9, 10 owned no cars.

The annual costs of the households in different deciles varied from 7623671.3 to 1353394.9 (table 4).

Table-4-Economical and demographic characteristics of the rural households in Southern Khorasan

Deciles / Variable		1	2	3	4	5	6	7	8	9	10
Age of warden		44.36	48.08	49.85	49.53	49.91	54.01	57.06	62.8	69.95	72.37
Gender of warden	Male	9.96	91.9	91.9	93.5	93.5	85.5	85.5	62.9	50	5.29
	Femal	3.1	8.1	8.1	6.5	6.5	14.5	14.5	37.1	50	70.5
Education	Literacy	87.7	72.6	58.1	62.9	56.5	45.2	30.6	17.7	4.8	1.6
	Illiteracy	12.3	27.4	41.9	37.1	46.5	54.8	69.4	82.3	95.2	98.4
Job	Employed	93.8	90.3	77.4	83.9	80.6	67.7	61.3	40.3	19.4	8.2
	Unemployed	6.2	9.7	22.6	16.1	19.4	32.3	38.7	59.7	80.6	91.8
household dimension		4.93	4.83	4.91	4.91	4.82	4.90	4.93	4.80	4.79	4.78
Type of home	Civilian areas	93.8	90.4	93.5	95.2	91.9	96.8	98.4	91.9	93.5	88.5
	Ownership	3.1	4.8	-	1.6	-	-	-	-	-	-
	service charge	3.1	4.8	-	-	-	-	-	-	-	-
	rental	-	-	6.5	-	4.8	-	-	1.6	-	-
	free of charge	-	-	-	3.2	3.2	3.2	1.6	6.5	6.5	7
Number of room		4	3.8	3.5	3.46	3.40	3.22	3.27	3.06	2.74	2.45
Size of House and		97.09	94.4	87.7	80	76.06	72.5	74.27	68.5	60.95	54.83
Car Ownership	Yes	67.7	46.8	51.6	21	0	3.2	1.6	0	0	0
	No	33.3	53.2	48.4	79	100	96.8	98.4	100	100	100
Costs		5762367.3	19552654.3	11770362.5	7865088.6	6000140	4675699	3830648.1	2886631.8	2105870.1	1353394.9

B- Analysis statistics

Pearson coefficient was employed for measurement of relationships between household expenditure as dependent variable and household dimension, Number of room, Size of House and age of warden as independent variables, results which show that there was positive relationship between household expenditure and household dimension, Number of room, size of House. There is additionally a negative, significant relationship between household expenditure and age of warden (Table 4).

Table 5. Relation household expenditure and independent variability

Variable1	Variable2	Correlation coefficient	R	Sig
Household expenditure	Age of warden	Pearson	**-0.273	0.000
	Household dimension	Pearson	*0.083	0.04
	Number of room	Pearson	**0.283	0.000
	Size of House and	Pearson	**0.269	0.000
Significant at 5% level (p < 0.05) and **Significant at 1% level (p < 0.01).				

To compare the costs of different households considering different variables of gender, literacy, employment, Car Ownership of the household' warden, a t-test was applied. The results indicated that there was a significant difference between the costs of households in different levels of the variables in question. The average of the costs of the households showed that the costs of the households whose heads were male, literate, employed, and owned a car was more than the ones whose heads were female, illiterate, unemployed, and without cars (Table 6).

Table 6. Compare the costs of different households considering different variables

Variable1	Variable Levels	Mean	T	Sig
Gender of warden	Male	14019230.19	5.235	0.000
	Female	4036957.05		
Education	Illiterate	19266683.90	8.673	0.000
	Literate	6015180.80		
Job	Employed	15997549.06	8.297	0.000
	Unemployed	4905442.22		
Car Ownership	Yes	28770638.02	11.381	0.000
	No	7766680.85		

Stepwise multiple linear regressions

Table 3 shows the result for regression analysis by stepwise method. Independent variables that were significantly related to household expenditure were entered. The result indicates that 39% of the variance in the perception of respondents could be explained by these variables.

Among all variables, "Car Ownership" (Beta coefficient: 00.304, sig.: 0.000); "Education Condition" (Beta coefficient: -0.173, sig.: 0.000); "Number of Room" (Beta coefficient: 0.136, sig.:0.000); influence the household expenditure. Other variables were not statistically significant.

Table 7- Multivariate Regression Analysis

Variable	B	Beta	T	Sig
Constant	40789535.80	--	7.683	0.000
Car Ownership	-15334606.9	-0.304	-7.626	0.000
Education	-6974592.23	-0.173	-4.428	0.000
Number of Room	2914985.91	0.136	3.574	0.000

$$sig = 58.767 \quad F = 0.399 \quad R^2 = 00.000$$

CONCLUSIONS AND SUGGESTIONS

This study took advantage of the model proposed by Iran Institute of Nutrition and the three approaches explained in the article to measure poverty line in rural areas in Southern Khorasan. The results revealed that during the years studied the absolute food poverty line and the annual total poverty lines were on the increase.

The study of the indicators of vulnerability also showed that in 2010, 2011, 2012 the percentage of vulnerable people were 28.2, 46.9, 28.4 respectively. During theses years, the highest level of vulnerability belonged to 2012 which was 46.9.

The study of vulnerability gap and intensity demonstrated that the widest gap and the highest intensity belonged to 2012. The narrowest gap belonged to 2010.

The findings of the study showed that employment and literacy of the head of the household made the household invulnerable. It is suggested that policy-makers make plans to create employment and provide literacy courses for adults.

Considering the fact that the households whose heads were female, and old were more vulnerable. Appropriate social care is suggested to be provided for such households.

Regarding other countries' experience with poverty and vulnerability, it is highly suggested that comprehensive social care is supplied which includes provision of subsidy to the vulnerable people, unemployment benefits, retirement insurance, disability Insurance, health and educational services.

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